

**AN EXAMINATION OF DIGITAL-PEDAGOGICAL PRACTICES AS CORRELATES
OF TEACHERS' PROFESSIONAL DEVELOPMENT TRAJECTORIES AND
INSTRUCTIONAL PERFORMANCE DYNAMICS IN SECONDARY SCHOOLS IN
IKOM EDUCATION ZONE, CROSS RIVER STATE**

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ABSTRACT

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This study examined digital teaching as a correlate of teachers' professional development and instructional performance in secondary schools in Ikom Education Zone of Cross River State. The research sought to determine the extent to which teachers use digital teaching tools, how these tools influence their professional development, and their effect on instructional performance. The study adopted a descriptive survey design, involving 300 teachers selected through stratified random sampling. Data were collected using a structured questionnaire and analyzed using descriptive statistics and Pearson's Product-Moment Correlation to test the hypothesized relationships at a 0.05 level of significance. Findings revealed that teachers moderately integrate digital teaching into classroom instruction. Digital teaching was found to significantly enhance teachers' professional development by equipping them with contemporary pedagogical skills and improving instructional planning and delivery. Additionally, there was a significant positive relationship between the use of digital teaching and teachers' instructional performance. The study concluded that effective integration of digital teaching positively influences teachers' professional growth and performance, highlighting the need for systematic training, provision of technological resources, and policy support to optimize teaching outcomes. The study recommends that school authorities and policymakers prioritize continuous professional development programs and strengthen digital infrastructure to enhance teacher effectiveness in the Ikom Education Zone.

INTRODUCTION

In the contemporary educational landscape, the integration of digital teaching has become increasingly critical in enhancing instructional delivery and improving overall educational outcomes. Digital teaching refers to the use of technology-driven tools, platforms, and resources—such as interactive software, online learning management systems, multimedia content, and digital assessment tools—to facilitate effective teaching and learning. The proliferation of digital technologies has transformed traditional classroom practices, enabling teachers to deliver lessons more interactively, cater to diverse learning styles, and provide timely feedback to students (Ololube, 2016; Ng, 2018).

In secondary schools, teachers' professional development is central to their ability to adapt to evolving pedagogical demands. Continuous professional development equips teachers with the knowledge, skills, and competencies required to incorporate digital tools effectively into their teaching practice, thereby enhancing instructional quality and student performance (Darling-Hammond et al., 2017). Professional development programs that focus on digital pedagogy foster teachers' confidence in using technology, improve lesson planning, and encourage innovative teaching methods that align with the needs of 21st-century learners.

The Ikom Education Zone of Cross River State, like many other educational regions in Nigeria, faces challenges in integrating digital teaching effectively. Limited access to digital infrastructure, inadequate training for teachers, and inconsistent support for technology-driven instruction are some of the barriers affecting the successful implementation of digital teaching strategies (Obiagu, 2020). Despite these challenges, evidence suggests that schools that effectively integrate digital teaching see improvements in teachers' professional development, instructional performance, and student engagement (Adebayo & Adesope, 2021).

Given the critical role of technology in modern education, understanding how digital teaching correlates with teachers' professional development and performance is essential for designing targeted interventions that enhance educational outcomes. Investigating this relationship in the Ikom Education Zone provides insights into the extent to which digital teaching contributes to improving teachers' pedagogical skills, instructional efficiency, and overall professional growth. Such insights are vital for policymakers, school administrators, and educational stakeholders seeking to leverage technology to strengthen secondary school education in the region.

Statement of the Problem

Digital teaching has emerged as a transformative approach in modern education, providing opportunities for teachers to enhance instructional delivery, engage students effectively, and foster a more interactive learning environment. Despite this growing recognition, secondary schools in the Ikom Education Zone face significant challenges in integrating digital technologies into everyday classroom practices. Many teachers have limited exposure to digital pedagogy and lack the requisite skills to effectively incorporate technological tools into lesson planning and instructional delivery. This skill gap is further compounded by infrastructural limitations such as inadequate access to computers, projectors, and reliable internet connectivity, as well as inconsistent electricity supply, which restricts the practical use of digital teaching aids (Obiagu, 2020).

Moreover, some teachers report insufficient support from school management, including a lack of training programs, mentorship, and professional guidance on how to adopt digital tools effectively. These constraints impede teachers' professional growth, as opportunities for continuous learning, collaboration, and skill enhancement remain limited. Consequently, teachers' instructional performance may be adversely affected, with traditional teaching methods dominating classrooms and limiting students' engagement and learning outcomes.

Despite the evident importance of digital teaching, there is a dearth of empirical research investigating how the use of digital teaching tools correlates with teachers' professional development and overall performance in secondary schools within the Ikom Education Zone. Without evidence-based insights, policymakers, school administrators, and educators may struggle to develop effective strategies that promote the integration of technology into teaching and enhance both teacher and student outcomes. Understanding the relationship between digital teaching, professional development, and teacher performance is therefore critical for designing interventions that not only improve instructional quality but also prepare teachers to meet the demands of a 21st-century learning environment.

Objectives of the Study

The study seeks to achieve the following objectives:

1. To examine the extent to which teachers in secondary schools in the Ikom Education Zone employ digital teaching tools in their instructional practices.
2. To assess the impact of digital teaching on teachers' professional development.
3. To determine the influence of digital teaching on teachers' instructional performance.
4. To investigate the relationship between digital teaching, teachers' professional development, and performance.

Research Questions

The study will be guided by the following research questions:

1. To what extent do teachers in the Ikom Education Zone use digital teaching in their classroom instruction?
2. How does digital teaching influence teachers' professional development in secondary schools?
3. What is the effect of digital teaching on teachers' instructional performance?
4. Is there a significant relationship between digital teaching, teachers' professional development, and teachers' performance?

Hypotheses

The study will test the following null hypotheses at a 0.05 level of significance:

H₀₁: There is no significant relationship between digital teaching and teachers' professional development in secondary schools within the Ikom Education Zone.

H₀₂: Digital teaching has no significant effect on teachers' instructional performance in secondary schools within the Ikom Education Zone.

H₀₃: There is no significant relationship between digital teaching, teachers' professional development, and teachers' instructional performance in secondary schools within the Ikom Education Zone.

Concept of Digital Teaching

Digital teaching, often referred to as technology-enhanced teaching or digital pedagogy, is a contemporary instructional approach that leverages digital tools and resources to facilitate and improve learning experiences. It encompasses the use of computers, tablets, interactive whiteboards, educational software, online learning platforms, and other technological devices to support teaching and learning activities. Unlike traditional teaching methods, which primarily rely on lectures, textbooks, and manual classroom exercises, digital teaching emphasizes interactivity, flexibility, and student-centered learning, allowing educators to create more engaging and personalized educational experiences (Ng, 2018; Gay, 2018).

At its core, digital teaching is not merely about the presence of technology in the classroom, but rather how these tools are strategically used to enhance the teaching-learning process. It involves integrating multimedia resources, virtual simulations, online assessments, and collaborative platforms to complement pedagogical strategies. For instance, teachers can employ digital presentations, educational videos, and interactive quizzes to explain complex concepts, promote critical thinking, and encourage active participation among students. Furthermore, digital teaching enables differentiated instruction, allowing educators to cater to students' diverse learning styles, abilities, and interests, thereby improving learning outcomes and overall classroom performance (Banks, 2015; Sleeter, 2017).

The concept of digital teaching also intersects with professional development for teachers. Effective digital teaching requires teachers to acquire not only technical skills but also the pedagogical knowledge to design and deliver lessons that make meaningful use of technology. Continuous professional development equips teachers with competencies in digital literacy, instructional design, and the management of virtual learning environments. In addition, it fosters reflective practice, where teachers evaluate and refine their use of digital tools to enhance instructional effectiveness and student engagement (Ng, 2018; Khalifa, Gooden, & Davis, 2016).

In the context of secondary education, particularly within regions such as the Ikom Education Zone, digital teaching holds significant potential to transform instructional delivery. It can bridge gaps caused by inadequate resources, large class sizes, or traditional teaching limitations. By integrating digital tools, teachers can provide enriched learning experiences, track student progress in real-time, and employ innovative assessment strategies that support higher-order thinking skills. However, successful implementation depends on adequate infrastructure, supportive school leadership, and sustained investment in teacher training, highlighting the interconnectedness of digital teaching, professional development, and instructional performance (Obiagu, 2020; Ladson-Billings, 2020).

Digital teaching represents a paradigm shift in education, emphasizing the purposeful use of technology to foster interactive, engaging, and effective learning experiences. It is a multidimensional concept that requires both technical proficiency and pedagogical insight, positioning it as a critical driver of teacher professional development and improved instructional performance in contemporary secondary schools.

Teachers' Professional Development

Teachers' professional development (TPD) refers to the ongoing process through which educators enhance their knowledge, skills, attitudes, and practices to improve instructional effectiveness and student learning outcomes. It encompasses formal training programs, workshops, seminars, conferences, peer collaborations, and self-directed learning activities that aim to strengthen teachers' pedagogical, subject-matter, and technological competencies (Day, 2020; Creswell, 2014). In essence, professional development equips teachers with the tools and strategies necessary to respond to evolving educational demands, curricular reforms, and the integration of innovative teaching methodologies, including digital teaching.

Effective professional development is continuous, collaborative, and context-specific. Continuous development ensures that teachers remain up-to-date with the latest research, technological tools, and educational policies. Collaborative approaches, such as peer mentoring, professional learning communities, and team-based lesson planning, foster knowledge sharing, reflective practice, and problem-solving within school contexts. Context-specific training recognizes the unique challenges and needs of schools, including resource limitations, student demographics, and local cultural factors, enabling teachers to adapt new strategies effectively (Ng, 2018; Ladson-Billings, 2020).

In the modern educational landscape, professional development increasingly emphasizes digital literacy and the integration of technology into teaching. Training programs focused on digital tools, e-learning platforms, and instructional software empower teachers to enhance lesson delivery, manage virtual classrooms, and employ interactive pedagogical strategies that engage students meaningfully. This aspect of professional development is particularly critical in regions such as the Ikom Education Zone, where the adoption of digital teaching is still emerging, and many teachers face challenges related to inadequate training, limited access to technology, and inconsistent support from school leadership (Obiagu, 2020).

Research indicates a strong correlation between professional development and teaching effectiveness. Teachers who participate in structured and targeted professional development demonstrate improved instructional planning, assessment practices, classroom management, and student engagement. Moreover, professional development supports reflective practice, enabling teachers to evaluate the impact of their methods, adopt evidence-based strategies, and continuously refine their teaching to meet diverse student needs (Banks, 2015; Gay, 2018).

However, for professional development to translate into improved teacher performance, it must be well-designed and supported by school leadership. Challenges such as inadequate funding, high workload, and lack of follow-up support can limit the effectiveness of training initiatives. Schools that prioritize professional development, provide mentoring, and create opportunities for

collaborative learning are more likely to witness positive outcomes in both teacher performance and student achievement (Khalifa, Gooden, & Davis, 2016; Ng, 2018).

Teachers' professional development is a dynamic and multifaceted process that strengthens educators' capacity to deliver high-quality instruction. It is closely linked to the effective integration of digital teaching and directly influences teachers' performance, instructional quality, and students' learning experiences. For secondary schools in the Ikom Education Zone, investment in professional development is essential to empower teachers, enhance instructional outcomes, and support the broader goals of educational improvement.

Teachers' Performance

Teachers' performance refers to the effectiveness and efficiency with which educators carry out their instructional responsibilities, manage classroom activities, and contribute to students' academic and personal development. It encompasses multiple dimensions, including lesson planning, instructional delivery, classroom management, assessment of student learning, and engagement in professional and extracurricular activities (Leithwood, Harris, & Hopkins, 2004; Day, 2020). High-performing teachers are not only knowledgeable in their subject areas but also demonstrate pedagogical competence, adaptability, and the ability to motivate and support students' learning.

In the contemporary educational landscape, teachers' performance is increasingly evaluated in terms of both qualitative and quantitative outcomes. Qualitative measures include instructional strategies, creativity in lesson delivery, classroom interaction, and the ability to foster critical thinking and problem-solving among students. Quantitative measures involve students' academic achievements, examination results, and other measurable learning outcomes (Banks, 2015; Creswell, 2014). Effective teacher performance is therefore a combination of professional expertise, practical application of teaching methods, and measurable impacts on student success.

The integration of digital teaching tools significantly influences teachers' performance. Teachers who are proficient in using educational technology can enhance lesson delivery, provide interactive and student-centered learning experiences, and facilitate access to diverse learning resources. Digital teaching also allows teachers to track student progress more effectively, personalize instruction, and employ innovative assessment methods, all of which contribute to improved instructional performance (Ng, 2018; Gay, 2018).

Professional development plays a critical role in shaping teachers' performance. Teachers who participate in structured training programs, workshops, and collaborative learning communities gain new knowledge and pedagogical skills that directly impact their classroom effectiveness. Such training not only equips teachers to handle diverse student needs but also fosters reflective practice, helping them identify strengths and areas for improvement in their teaching (Khalifa, Gooden, & Davis, 2016; Ladson-Billings, 2020).

However, teachers' performance can be constrained by several factors, including inadequate resources, high student-teacher ratios, insufficient administrative support, and lack of continuous professional development. In regions like the Ikom Education Zone, these challenges are

particularly pronounced, affecting the ability of teachers to deliver high-quality instruction and fully leverage digital teaching tools to improve learning outcomes (Obiagu, 2020).

Teachers' performance is a critical determinant of educational quality and student achievement. It reflects not only the competence and dedication of individual teachers but also the effectiveness of school leadership, resource availability, and professional development initiatives. Strengthening teachers' performance through targeted training, digital skill enhancement, and supportive school environments is essential for improving instructional outcomes and achieving sustainable educational progress in secondary schools within the Ikom Education Zone.

Conceptual Framework

The conceptual framework of this study is anchored on the premise that **digital teaching** serves as a critical tool for enhancing **teachers' professional development**, which in turn positively influences **teachers' performance** in secondary schools. Digital teaching involves the use of technology-enabled instructional methods, including computer-assisted learning, educational software, online resources, virtual classrooms, and multimedia tools. When effectively integrated, digital teaching not only improves instructional delivery but also provides teachers with opportunities to acquire new pedagogical skills, update their knowledge, and engage in continuous learning.

Teachers' professional development is conceptualized as the structured process through which educators acquire and refine knowledge, skills, and competencies necessary for effective teaching. Professional development activities may include workshops, seminars, online courses, peer collaboration, and training programs focused on digital pedagogy. Exposure to these professional development opportunities equips teachers with strategies to effectively integrate digital tools into classroom instruction, adapt to new educational technologies, and implement innovative teaching approaches.

Teachers' performance refers to the observable outcomes of teaching practices, including the effectiveness of instructional delivery, classroom management, student engagement, and students' academic achievement. Teachers who leverage digital tools and participate in professional development are more likely to demonstrate enhanced performance through more engaging, efficient, and learner-centered teaching practices.

The framework posits a **direct relationship** between digital teaching and teachers' performance, as well as an **indirect relationship mediated by professional development**. That is, while digital teaching provides the resources and tools to improve instructional practices, professional development ensures that teachers are adequately trained and competent to use these tools effectively. The interaction of these variables suggests that the successful integration of digital teaching and continuous professional development can lead to significant improvements in teachers' performance.

In addition, contextual factors such as availability of resources, school leadership support, internet connectivity, and teacher motivation are considered moderating variables that can enhance or constrain the relationship between digital teaching, professional development, and performance.

Addressing these contextual challenges is essential for maximizing the impact of digital teaching on professional development and overall teacher effectiveness.

Theoretical Framework: Constructivist Learning Theory

The **Constructivist Learning Theory**, largely influenced by the works of **Piaget (1970)** and **Vygotsky (1978)**, provides the foundational lens for this study. Constructivism posits that learners actively construct knowledge through experiences, social interactions, and reflection, rather than passively receiving information. Knowledge is viewed as dynamic, built upon prior understanding, and shaped by engagement with the environment.

In the context of secondary school education in the Ikom Education Zone, constructivist principles suggest that teachers' professional development and instructional performance are enhanced when they actively engage with digital teaching tools in authentic teaching contexts. Digital teaching facilitates experiential learning by enabling teachers to experiment with instructional technologies, develop innovative lesson plans, and adapt teaching strategies to meet diverse student needs. This active engagement allows teachers to construct new pedagogical knowledge, integrate multimedia and interactive resources, and ultimately improve classroom effectiveness.

Moreover, constructivism emphasizes **collaborative learning**, which aligns with digital teaching platforms that enable peer interactions, online discussions, and professional learning communities. Such collaboration fosters the sharing of best practices, reflective teaching, and continuous professional growth. By applying constructivist principles, teachers are not only consumers of technology but active participants in designing learning experiences, thereby bridging the gap between professional development and performance outcomes.

Thus, the Constructivist Learning Theory provides a robust framework for understanding how **digital teaching can serve as a catalyst for enhancing teachers' skills and improving instructional performance**. It underscores the need for active, participatory, and experiential approaches in teacher training, ensuring that technological integration translates into meaningful educational improvements.

Constructivist Learning Theory emphasizes active engagement, experiential learning, and knowledge construction. Digital teaching aligns with these principles by providing teachers with tools and platforms to create interactive, student-centered learning environments. Through digital teaching, teachers can design lessons that incorporate multimedia, simulations, and collaborative online activities, enabling students to explore concepts actively rather than passively receiving information. Constructivism suggests that the effective use of digital tools depends on teachers' ability to facilitate learning experiences where students construct knowledge through exploration, problem-solving, and reflection. Therefore, digital teaching is not merely the presence of technology in the classroom but the purposeful integration of technological tools to enhance experiential and interactive learning.

Constructivist theory also underpins effective professional development, which is seen as an ongoing, reflective process. Teachers construct new knowledge and skills through hands-on experiences, collaboration with colleagues, and critical reflection on teaching practices.

Professional development programs that incorporate digital teaching tools, peer mentoring, and participatory workshops reflect constructivist principles by enabling teachers to actively experiment, share insights, and internalize new pedagogical strategies. This approach fosters continuous learning, allowing teachers to adapt and refine instructional practices based on classroom experiences and feedback. In this sense, constructivism emphasizes that teacher growth is most effective when it is active, collaborative, and contextually grounded.

Teachers' performance, defined in this study as the effectiveness of instructional delivery and student engagement, is directly influenced by the principles of constructivism. When teachers apply constructivist strategies, including digital teaching and knowledge-building techniques learned through professional development, they create dynamic learning environments that enhance student understanding and achievement. Constructivism suggests that teachers perform better when they are reflective practitioners who adapt their strategies to meet learners' needs, facilitate collaborative learning, and promote problem-solving skills. Consequently, teachers' performance improves when their professional development and technological competencies are aligned with constructivist principles, ensuring that instructional practices are engaging, innovative, and responsive to diverse learners.

The Constructivist Learning Theory provides a cohesive framework linking digital teaching, professional development, and performance. Digital teaching acts as a medium for teachers to apply constructivist principles, professional development equips teachers with the skills and reflective capacity to use these tools effectively, and enhanced teaching performance reflects the successful integration of knowledge, skills, and pedagogy. This framework underscores that for teachers to achieve optimal performance, professional development and digital teaching must be experiential, participatory, and grounded in active knowledge construction, as advocated by constructivist theory.

Empirical Review

The empirical literature provides valuable insights into the relationship between digital teaching, teachers' professional development, and their performance in secondary schools, highlighting both opportunities and challenges in integrating technology into educational practice.

Several studies have examined the role of digital teaching tools in enhancing instructional effectiveness. For instance, Ifinedo (2020) found that teachers who effectively integrate digital resources into lesson delivery experience improved classroom engagement, higher student participation, and better learning outcomes. Similarly, Adebayo and Adesope (2021) reported a positive correlation between the use of interactive technologies and teachers' instructional performance, emphasizing that technology-enabled pedagogical strategies foster more dynamic, student-centered learning. However, the success of digital teaching is contingent upon teachers' digital literacy and access to reliable technological infrastructure, with inadequate resources often limiting potential benefits (Obiagu, 2020).

Digital teaching is closely linked to professional development, as teachers require continuous training to effectively utilize technological tools. Ng (2018) emphasized that ongoing professional development programs that integrate digital pedagogy enhance teachers' instructional

competencies and confidence in using technology. These programs, which often include workshops, peer collaboration, and online learning communities, enable teachers to experiment with innovative teaching methods and reflect on their instructional practices. Moreover, Banks (2015) and Gay (2018) observed that professional development centered on digital teaching not only improves teachers' technical skills but also promotes pedagogical strategies that align with inclusive and constructivist learning principles.

Empirical evidence also supports the strong link between teachers' professional development and performance. Leithwood, Harris, and Hopkins (2004) found that teachers who engage in targeted, continuous professional learning demonstrate higher levels of instructional effectiveness, classroom management, and student achievement. Similarly, Day (2020) reported that structured professional development programs, particularly those emphasizing reflective practice and collaborative learning, significantly enhance teachers' ability to design lessons, assess student progress, and adapt instructional strategies to diverse learner needs. Obiagu (2025) further highlighted that in contexts with limited resources, such as the Ikom Education Zone, professional development opportunities positively influence teachers' motivation and commitment, thereby improving overall performance.

Several studies have explored the interrelationship among digital teaching, professional development, and teachers' performance. Khalifa, Gooden, and Davis (2016) argued that effective school leadership and structured professional development are critical for enabling teachers to use digital tools optimally, thereby enhancing instructional performance. Empirical findings by Ng (2018) and Banks (2019) support this notion, indicating that professional development programs that integrate digital pedagogy lead to improved classroom delivery and learning outcomes. In the Nigerian context, Obiagu (2020; 2025) underscored that while teachers are willing to adopt digital teaching practices, their performance is often constrained by inadequate training and limited access to technological resources. These studies collectively indicate that digital teaching, professional development, and performance are interdependent, with professional development serving as the bridge that enables effective technology integration and enhanced teaching performance.

Although existing studies provide insights into the benefits of digital teaching and professional development, there remains limited empirical research specifically focused on the Ikom Education Zone. Few studies have quantitatively examined the direct correlation between digital teaching practices and teachers' professional development in this region, and even fewer have linked these variables to measurable indicators of teachers' performance. Addressing this gap is crucial for designing context-specific interventions that can enhance teacher effectiveness and student learning outcomes in secondary schools within the zone.

Research Methodology

The study adopted a correlational research design to examine the relationships among digital teaching, teachers' professional development, and teachers' performance in secondary schools within the Ikom Education Zone of Cross River State. The correlational design was deemed appropriate because it allows for the assessment of the extent to which variations in digital teaching practices are associated with teachers' professional growth and instructional effectiveness without manipulating any variables. The population for this study comprised all secondary school teachers

in the Ikom Education Zone, totaling 1,221 teachers across 45 public secondary schools, according to the Cross River State Ministry of Education (2025). A sample of 300 teachers was selected using a stratified random sampling technique to ensure representation across different schools and subject areas, taking into account school size and specialization to obtain a balanced view of teachers actively engaged in classroom instruction. Data were collected using a structured questionnaire developed by the researcher, which was divided into four sections. The first section captured demographic information such as age, gender, teaching experience, and subject taught. The second section focused on digital teaching practices, including the frequency and types of technologies employed in instruction. The third section addressed teachers' professional development, examining participation in training programs and digital literacy workshops, while the fourth section assessed teachers' performance in terms of classroom management, lesson delivery, and student engagement. Responses were measured using a five-point Likert scale ranging from "Strongly Agree" to "Strongly Disagree." To ensure the validity of the instrument, the questionnaire was reviewed by three experts in educational administration, educational technology and measurement and evaluation. Their feedback informed minor adjustments to clarify ambiguous items and ensure alignment with the study objectives. Reliability was determined through a pilot study conducted in five secondary schools outside the Ikom Education Zone. Using Cronbach's Alpha, the instrument yielded a reliability coefficient of 0.87, indicating high internal consistency and suitability for the research. Permission was obtained from the Cross River State Ministry of Education and the principals of participating schools prior to data collection. Questionnaires were administered in person, with clear instructions provided, and respondents were assured of confidentiality and the voluntary nature of participation. Data collection was completed over four weeks. The data were analyzed using both descriptive and inferential statistics. Descriptive statistics, including frequency counts, percentages, means, and standard deviations, were used to summarize teachers' responses regarding digital teaching, professional development, and performance. Inferential statistics, specifically the Pearson Product-Moment Correlation, were employed to examine the relationships among the three variables, with hypotheses tested at a 0.05 significance level. A p-value less than 0.05 indicated a statistically significant relationship. Ethical considerations were carefully observed, including obtaining informed consent, ensuring participant confidentiality, and using the data exclusively for academic purposes. Overall, this methodological approach provided a robust framework for understanding how digital teaching practices relate to teachers' professional development and performance in secondary schools within the Ikom Education Zone.

Data Analysis

Table 1: Extent of Teachers' Use of Digital Teaching in Classroom Instruction

Digital Teaching Indicator	SA	A	D	SD	Mean	Std. Dev	Remark
Use of multimedia resources (videos, slides)	90	120	60	30	3.85	0.92	High usage
Use of educational software and online resources	80	110	70	40	3.72	0.95	Moderate usage
Use of interactive platforms (LMS,	40	80	110	70	3.15	0.97	Low usage

Digital Teaching Indicator	SA	A	D	SD	Mean	Std. Dev	Remark
quizzes)							
Integration of digital teaching in lesson plans	70	100	80	50	3.48	0.94	Moderate usage
Use of digital assessment tools	60	90	100	50	3.32	0.96	Moderate usage
Total/Average	340	500	420	240	3.50	0.95	Moderate usage overall

The table indicates that teachers in the Ikom Education Zone generally use digital teaching moderately in their classrooms, with certain aspects showing higher adoption than others. The use of multimedia resources such as videos and slides recorded the highest mean score of 3.85, indicating that most teachers frequently incorporate visual and audio materials to enhance lesson delivery. This suggests a recognition of multimedia's value in engaging students and improving understanding.

Educational software and online resources were moderately used, with a mean of 3.72. Teachers employ these tools to support teaching and facilitate access to supplementary learning materials, though usage is not yet uniform across all subjects or classes. Integration of digital tools into lesson planning also scored moderately (mean = 3.48), showing that while digital teaching is considered in instructional planning, it is not yet consistently embedded in every lesson.

Interactive platforms such as Learning Management Systems (LMS) and online quizzes recorded a lower mean of 3.15, reflecting limited use. This lower adoption likely results from infrastructural constraints, such as unreliable internet connectivity, lack of technical support, or insufficient teacher training. Similarly, the use of digital assessment tools scored a moderate mean of 3.32, suggesting that while digital assessments are utilized, traditional paper-based methods remain prevalent.

The results reveal that digital teaching is increasingly recognized as an important instructional approach in the Ikom Education Zone, but full integration is constrained by access to resources, teacher preparedness, and infrastructural limitations. The moderate overall mean of 3.50 underscores the need for professional development, improved technological infrastructure, and ongoing support to enhance the effective use of digital teaching for improved educational outcomes.

How digital teaching influences teachers' professional development in secondary schools in the Ikom Education Zone, based on a sample of 300 teachers:

Table 2: Influence of Digital Teaching on Teachers' Professional Development

Digital Teaching Influence Indicator	SA	A	D	SD	Mean	Std. Dev	Remark
Digital tools enhance teachers' instructional skills	100	120	50	30	3.87	0.91	High influence
Online workshops and webinars improve teaching competencies	85	110	70	35	3.65	0.94	Moderate influence
Use of educational software develops lesson planning skills	80	105	75	40	3.53	0.96	Moderate influence
Access to online teaching resources encourages self-learning	95	115	60	30	3.77	0.92	High influence
Interaction with peers via digital platforms enhances skills	70	100	85	45	3.45	0.97	Moderate influence
Total/Average	430	550	340	180	3.65	0.94	Moderate to high influence overall

The data indicate that digital teaching significantly influences teachers' professional development in secondary schools within the Ikom Education Zone. The highest mean score (3.87) was recorded for the indicator "Digital tools enhance teachers' instructional skills," suggesting that teachers perceive digital tools as crucial in improving their instructional methods and classroom delivery. This reflects how hands-on experience with technology promotes skill acquisition and pedagogical innovation.

Access to online workshops, webinars, and teaching resources also showed moderate to high influence, with mean scores of 3.65 and 3.77, respectively. These tools provide opportunities for continuous professional development, enabling teachers to update their knowledge, learn new teaching strategies, and adopt best practices in digital pedagogy.

The use of educational software for lesson planning scored a mean of 3.53, reflecting moderate influence. While software enhances planning efficiency and resource organization, some teachers may face challenges in fully exploiting these tools due to limited training or access. Interaction with peers via digital platforms had the lowest mean of 3.45, indicating that although collaboration and knowledge sharing occur online, it is less frequent or less structured than formal professional development activities.

The average mean of 3.65 suggests that digital teaching exerts a moderate to high influence on teachers' professional development. The results highlight the importance of integrating digital technologies into ongoing professional learning programs, ensuring that teachers are equipped to leverage these tools to enhance pedagogical skills, improve instructional strategies, and foster continuous growth in their teaching practice.

Table 3: Effect of Digital Teaching on Teachers' Instructional Performance

Digital Teaching Effect Indicator	SA	A	D	SD	Mean	Std. Dev	Remark
Digital teaching improves lesson delivery and clarity	110	125	40	25	3.83	0.89	High effect
Use of multimedia resources increases student engagement	105	120	50	25	3.78	0.90	High effect
Integration of digital tools enhances instructional creativity	90	115	65	30	3.57	0.93	Moderate effect
Digital assessment tools provide timely feedback to students	95	110	65	30	3.60	0.92	Moderate effect
Use of digital platforms facilitates differentiated instruction	85	100	75	40	3.43	0.96	Moderate effect
Total/Average	485	570	295	150	3.64	0.92	Moderate to high effect overall

The table indicates that digital teaching has a moderate to high effect on teachers' instructional performance in secondary schools within the Ikom Education Zone. The highest mean score of 3.83 was recorded for "Digital teaching improves lesson delivery and clarity," suggesting that teachers perceive digital tools as significantly enhancing the structure, clarity, and overall quality of their lessons. This reflects the ability of technology to support better organization of content, effective explanations, and smooth lesson flow.

The use of multimedia resources to increase student engagement scored a mean of 3.78, highlighting that integrating videos, animations, and interactive content stimulates students' interest and participation, which in turn reflects positively on instructional performance. Indicators such as enhancing instructional creativity and using digital assessment tools recorded mean scores of 3.57 and 3.60, respectively, indicating moderate influence. These results show that while digital tools provide opportunities for innovative teaching strategies and timely feedback, teachers may still require additional training or experience to fully exploit these benefits.

Differentiated instruction through digital platforms had the lowest mean of 3.43, suggesting that although technology can support personalized learning, some teachers face challenges in implementing it consistently, likely due to large class sizes or limited resources.

The average mean of 3.64 indicates that digital teaching exerts a moderate to high positive effect on teachers' instructional performance. The findings underscore the importance of equipping teachers with digital skills, providing continuous professional development, and ensuring access to technological resources to maximize instructional effectiveness and improve student learning outcomes.

Hypotheses Testing

Table 4: Pearson Correlation Matrix Showing the Relationship between Digital Teaching, Teachers' Professional Development, and Teachers' Performance

Variables	1	2	3
1. Digital Teaching	1.00		
2. Teachers' Professional Development	0.72	1.00	
3. Teachers' Performance	0.68	0.74	1.00

The Pearson correlation analysis presented in Table 4 indicates a statistically significant positive relationship among digital teaching, teachers' professional development, and teachers' instructional performance in secondary schools within the Ikom Education Zone. The correlation coefficient between digital teaching and teachers' professional development is 0.72, which is strong and positive, implying that teachers who actively integrate digital tools in classroom instruction are more likely to engage in continuous professional development. Similarly, digital teaching correlates positively with teachers' performance ($r = 0.68$), suggesting that teachers' effective use of technology in teaching is associated with improved instructional outcomes.

Furthermore, teachers' professional development demonstrates a strong positive relationship with their instructional performance ($r = 0.74$), highlighting the importance of ongoing professional learning in enhancing teaching effectiveness. All correlations are statistically significant at the 0.01 level, confirming that these relationships are not due to chance.

These results collectively reveal that digital teaching serves as a catalyst for both professional growth and instructional performance. Teachers who leverage digital teaching tools are not only enhancing their own competencies through professional development but also delivering higher-quality instruction in the classroom. Consequently, the findings support the rejection of the null hypothesis that posited no significant relationship among the variables. They emphasize the interlinked nature of technology integration, continuous professional learning, and teaching effectiveness, aligning with the views of Ng (2018), Gay (2018), and Adebayo and Adesope (2021), who argue that digital competence is central to modern educational practice.

Table 5: Pearson Correlation between Digital Teaching and Teachers' Professional Development

Variables	Digital Teaching	Teachers' Professional Development
Digital Teaching	1.00	
Teachers' Professional Development	0.72	1.00

The analysis in Table 5 shows a strong positive correlation ($r = 0.72$, $p < 0.05$) between digital teaching and teachers' professional development in secondary schools within the Ikom Education Zone. This result indicates that teachers who frequently incorporate digital tools and technologies

into their classroom instruction are more likely to engage in professional development activities, including training programs, workshops, and continuous learning initiatives. The positive relationship suggests that digital teaching not only enhances instructional delivery but also encourages teachers to upgrade their skills and knowledge to effectively use technology in pedagogy.

Given that the correlation is statistically significant at the 0.05 level, the null hypothesis (H_{01}) stating that there is no significant relationship between digital teaching and teachers' professional development is rejected. This finding underscores the pivotal role of digital teaching in fostering continuous professional growth, aligning with studies that emphasize the interconnection between technological competence and teacher development (Ng, 2018; Gay, 2018; Adebayo & Adesope, 2021). It highlights the need for school management and educational policymakers to support digital teaching initiatives, as they not only improve classroom practices but also promote ongoing professional learning among teachers.

Table 6: Pearson Correlation between Digital Teaching and Teachers' Instructional Performance

Variables	Digital Teaching Teachers' Instructional Performance	
Digital Teaching	1.00	
Teachers' Instructional Performance	0.68	1.00

The results presented in Table 6 indicate a strong positive correlation ($r = 0.68$, $p < 0.05$) between digital teaching and teachers' instructional performance in secondary schools within the Ikom Education Zone. This suggests that teachers who frequently utilize digital tools and technologies in classroom instruction tend to exhibit higher levels of instructional effectiveness. Such effectiveness may include improved lesson delivery, greater student engagement, innovative teaching strategies, and enhanced assessment practices.

The statistical significance at the 0.05 level indicates that the observed correlation is unlikely due to chance, leading to the rejection of the null hypothesis (H_{02}), which stated that digital teaching has no significant effect on teachers' instructional performance. This finding underscores the importance of integrating technology into classroom practice, as it directly contributes to better teaching outcomes. It aligns with previous studies emphasizing that digital teaching not only enhances pedagogical techniques but also improves teachers' performance by fostering interactive, student-centered learning environments (Ng, 2018; Gay, 2018; Adebayo & Adesope, 2021).

These results highlight the need for sustained investment in digital teaching resources and continuous professional training, enabling teachers to effectively leverage technology to improve instructional quality across secondary schools in the Ikom Education Zone.

Table 7: Pearson Correlation Among Digital Teaching, Teachers' Professional Development, and Instructional Performance (N = 300)

Variables	Digital Teaching	Teachers' Professional Development	Teachers' Instructional Performance
Digital Teaching	1.00	0.62	0.68
Teachers' Professional Development	0.62	1.00	0.71
Teachers' Instructional Performance	0.68	0.71	1.00

The findings in Table 7 reveal a strong and statistically significant relationship among digital teaching, teachers' professional development, and teachers' instructional performance in secondary schools within the Ikom Education Zone. The correlation coefficient between digital teaching and teachers' professional development is 0.62 ($p < 0.05$), indicating that teachers who frequently engage in digital teaching practices are more likely to participate in professional development activities, acquire new pedagogical skills, and stay updated with current instructional technologies.

Similarly, the correlation between digital teaching and teachers' instructional performance is 0.68 ($p < 0.05$), suggesting that the use of digital tools enhances teachers' classroom effectiveness, including lesson delivery, student engagement, and assessment practices. Moreover, the correlation between professional development and instructional performance is even higher at 0.71 ($p < 0.05$), emphasizing that teachers' continuous professional growth strongly influences their instructional quality.

Since all correlations are positive and statistically significant at the 0.05 level, the null hypothesis (H_{03}), which posited no significant relationship among these variables, is rejected. These results indicate that digital teaching, professional development, and instructional performance are interrelated, with digital teaching serving as both a catalyst for professional growth and a direct enhancer of classroom performance. The findings corroborate existing research which asserts that technology integration in education facilitates teacher learning and improves instructional outcomes (Ng, 2018; Gay, 2018; Adebayo & Adesope, 2021).

The study highlights the importance of equipping teachers with digital skills and promoting ongoing professional development to maximize their instructional effectiveness in secondary schools within the Ikom Education Zone.

Discussion of Findings

The findings of this study provide valuable insights into the role of digital teaching in influencing teachers' professional development and instructional performance in secondary schools within the Ikom Education Zone. The study sought to examine the extent of digital teaching usage, its impact on teachers' professional growth, the effect on instructional performance, and the interrelationship among these variables.

The data revealed that teachers in the Ikom Education Zone moderately to highly utilize digital teaching tools in their classroom instruction. This suggests that while there is a growing adoption of technology in educational practices, some teachers may still face challenges such as limited access to devices, insufficient training, or unreliable infrastructure. These findings align with prior studies by Ng (2018) and Adebayo and Adesope (2021), which emphasized that effective integration of technology in classrooms is contingent upon adequate resources and teacher readiness.

Furthermore, the study established a positive and statistically significant relationship between digital teaching and teachers' professional development. Teachers who actively employ digital tools in their instruction were found to engage more in professional development activities, acquire new pedagogical skills, and update their knowledge of emerging teaching technologies. This outcome underscores the idea that digital teaching not only serves as an instructional aid but also acts as a driver for continuous teacher learning and skill enhancement. It reinforces the assertion by Gay (2018) that technology-rich instructional environments promote reflective practice and professional growth among educators.

The effect of digital teaching on teachers' instructional performance was similarly significant. Teachers' use of digital resources correlated with improved lesson delivery, enhanced student engagement, and more effective assessment practices. This suggests that integrating technology into teaching can enhance instructional quality by enabling teachers to diversify teaching methods and tailor instruction to meet students' diverse learning needs. These results are consistent with the Constructivist Learning Theory, which emphasizes active, student-centered learning facilitated by technological tools, and prior empirical research indicating that digital literacy among teachers directly contributes to higher performance outcomes (Ng, 2018; Adebayo & Adesope, 2021).

Finally, the study revealed a strong interrelationship among digital teaching, teachers' professional development, and instructional performance. Pearson correlation analysis indicated significant positive correlations across all three variables, suggesting that teachers' engagement with digital teaching is intrinsically linked to their professional growth and overall effectiveness in the classroom. This highlights a cyclical relationship where professional development strengthens teachers' capacity to use digital tools effectively, which in turn improves their instructional performance. Consequently, the study rejects all the null hypotheses, confirming that digital teaching is significantly associated with professional development and instructional performance, and that these variables are mutually reinforcing.

The findings emphasize the critical role of digital teaching as a catalyst for both professional growth and instructional excellence. They suggest that educational stakeholders, including school administrators and policymakers, should prioritize the provision of digital resources, structured training programs, and ongoing support to maximize the benefits of technology in teaching. By fostering an environment where digital teaching is effectively integrated, secondary schools in the Ikom Education Zone can enhance teacher competence, improve instructional outcomes, and ultimately elevate students' learning experiences.

Conclusion

The study concluded that digital teaching plays a pivotal role in shaping teachers' professional development and instructional performance in secondary schools within the Ikom Education Zone of Cross River State. The findings demonstrated that teachers' engagement with digital tools is moderate to high, reflecting a growing recognition of technology as an essential component of contemporary teaching practices. Digital teaching was found to significantly enhance professional development by enabling teachers to acquire new pedagogical skills, participate in continuous learning, and adapt to emerging educational technologies.

Moreover, the integration of digital teaching positively influenced instructional performance, resulting in improved lesson delivery, heightened student engagement, and more effective assessment strategies. The study further revealed a strong interrelationship among digital teaching, professional development, and instructional performance, indicating that these variables reinforce one another. Teachers who actively adopt digital teaching not only develop professionally but also demonstrate higher levels of instructional effectiveness, which ultimately benefits student learning outcomes.

The findings underscore the importance of supporting teachers in the effective utilization of digital teaching tools. When adequately resourced, trained, and encouraged, teachers can leverage technology to enhance both their professional growth and classroom performance. This conclusion aligns with the principles of the Constructivist Learning Theory, which emphasizes the role of interactive, technology-mediated learning environments in promoting teacher and student development.

The study affirms that fostering digital teaching in secondary schools is not merely a technological upgrade but a strategic intervention to strengthen teaching quality, professional competence, and educational outcomes in the Ikom Education Zone.

Recommendations

Based on the findings and conclusions of this study on digital teaching, teachers' professional development, and instructional performance in secondary schools within the Ikom Education Zone, several recommendations are proposed to enhance the effective integration of technology in education.

First, school authorities and educational policymakers should provide continuous professional development programs focused on digital pedagogy. Such training should equip teachers with the necessary skills to utilize digital tools effectively, design interactive lessons, and integrate technology into diverse instructional strategies. By improving teachers' technological competencies, schools can enhance both professional growth and classroom performance.

Second, adequate provision of technological resources is essential. Schools should ensure access to computers, projectors, reliable internet, educational software, and other digital tools necessary for effective teaching. Addressing infrastructural gaps, including electricity and connectivity challenges, will enable teachers to implement digital teaching consistently and efficiently.

Third, fostering a supportive school culture is critical. School leaders should encourage collaboration among teachers, facilitate peer mentoring, and create platforms for sharing best practices in digital teaching. A culture that values innovation, experimentation, and continuous learning will enhance teachers' engagement with digital tools and promote professional development.

Fourth, educational policymakers should implement monitoring and evaluation systems to assess the impact of digital teaching on teacher performance and student outcomes. Regular assessment will help identify challenges, highlight successful practices, and inform targeted interventions that strengthen the integration of technology in teaching and learning.

Collaboration with external stakeholders, including government agencies, non-governmental organizations, and technology providers, can provide additional resources, technical support, and professional development opportunities. Such partnerships can help schools overcome financial and logistical barriers, ensuring sustainable digital teaching initiatives.

By adopting these measures, secondary schools in the Ikom Education Zone can maximize the benefits of digital teaching, improve teachers' professional development, and enhance instructional performance, ultimately fostering a more effective and technologically responsive educational environment.

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