

Digital Pedagogy Deployment in Tertiary Institutions in Kogi State, Nigeria: Impact and Challenges

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Abstract

Digital pedagogy offers a powerful approach to improving teaching and learning in higher education, yet its adoption in Nigerian tertiary institutions remains uneven. This study explores how digital tools and platforms are being deployed in Kogi State tertiary institutions, examining their impact on instructional quality, student engagement, and learning outcomes, as well as the challenges that hinder effective integration. Using a mixed-methods design, data were collected from lecturers, students, and administrators through structured questionnaires and semi-structured interviews. Results show that digital tools—such as learning management systems, virtual classrooms, and multimedia resources—enhance student participation, motivation, and comprehension. However, obstacles including inadequate ICT infrastructure, unreliable internet connectivity, limited digital literacy, and resistance to change prevent full utilization. To address these challenges, the study recommends targeted investment in ICT infrastructure, continuous professional development for lecturers and students, supportive institutional policies, robust technical assistance, and fostering a culture of collaboration and innovation. These insights provide a practical roadmap for policymakers and educators aiming to strengthen digital pedagogy in resource-limited higher education settings, ultimately improving access, equity, and the quality of learning.

Keywords: digital pedagogy, higher education, e-learning adoption, learning management systems, Nigeria, ICT infrastructure

Introduction

Digital pedagogy, defined as the integration of digital technologies into teaching and learning processes, has emerged as a central feature of modern higher education globally (Zheng *et al.*, 2025; Maluleke & Maake, 2025). The COVID-19 pandemic accelerated the adoption of digital learning platforms and online instructional strategies, compelling institutions to rapidly adapt conventional teaching approaches to maintain educational continuity (Nyongesa & Van Der Westhuizen, 2025). In Nigeria, and particularly in Kogi State, tertiary institutions—including universities, polytechnics, and colleges of education—have historically relied on traditional face-to-face instruction (Itasanmi, 2023; Isah & Obiorah, 2025). While digital tools such as learning management systems (LMS), virtual classrooms, and multimedia resources are increasingly available, adoption remains uneven due to

infrastructural deficits, inadequate ICT resources, and limited digital literacy among both students and lecturers (Obasi & Ojo, 2020; Adedjoja & Olumoriin, 2018).

Research indicates that digital pedagogy improves student engagement, motivation, and learning outcomes by facilitating interactive and collaborative learning experiences (Zheng et al., 2025). Moreover, integrating digital tools supports the development of digital literacy skills critical for employability in the 21st-century workforce (Maluleke & Maake, 2025). Despite this potential, barriers such as unreliable internet connectivity, resistance to change from traditional teaching methods, and insufficient institutional support constrain the effectiveness of digital pedagogy in Nigerian contexts (Itasanmi, 2023; Isah & Obiorah, 2025).

The theoretical foundations for digital pedagogy adoption include the Technology Acceptance Model (TAM), which posits that perceived usefulness and perceived ease of use influence individuals' intentions to adopt new technologies (Davis, 1989), and the Diffusion of Innovation (DOI) theory, which explains how innovations are adopted and diffused within social systems (Rogers, 2003). Applying these models to Nigerian tertiary institutions suggests that both institutional and personal factors mediate adoption. For instance, institutional support, technical infrastructure, and policy alignment interact with lecturers' self-efficacy and students' digital competence to shape adoption outcomes (Obasi & Ojo, 2020; Nyongesa & Van Der Westhuizen, 2025).

Given the limited research specifically addressing the deployment of digital pedagogy in Kogi State tertiary institutions, this study seeks to fill the knowledge gap by systematically investigating the current state of digital pedagogy, its impact on teaching and learning outcomes, and the challenges impeding effective integration. The findings are intended to inform policy, guide institutional strategies, and provide a framework for enhancing digital pedagogy adoption in resource-constrained higher education environments (Zheng et al., 2025; Maluleke & Maake, 2025; Itasanmi, 2023).

Literature Review

Digital pedagogy has been widely recognized as a transformative approach to teaching and learning in higher education. Its adoption involves the strategic integration of digital tools, platforms, and resources to enhance instructional quality, student engagement, and learning outcomes (Zheng et al., 2025; Maluleke & Maake, 2025). Across African universities, studies have demonstrated that students exposed to digital learning environments exhibit higher levels of motivation, participation, and knowledge retention compared to those in traditional classroom settings (Nyongesa & Van Der Westhuizen, 2025; Itasanmi, 2023).

Digital pedagogy has evolved from the simple use of computers in education to a comprehensive approach that integrates digital technologies into all aspects of teaching and learning. Contemporary scholars describe digital pedagogy as the thoughtful application of digital tools, resources, and platforms to facilitate meaningful educational experiences. It emphasizes active learning, collaboration, creativity, and learner autonomy rather than mere technological adoption. Recent scholarship suggests that digital pedagogy encompasses various instructional approaches, including blended learning, online learning, flipped classrooms, mobile learning, and technology-enhanced collaborative learning. These approaches enable educators to move beyond traditional teacher-centred instruction toward more participatory and learner-centred educational environments.

Digital pedagogy also aligns with constructivist learning theories, which emphasize the active construction of knowledge through interaction and experience. Through digital platforms, students can access diverse learning resources, engage in collaborative projects, participate in discussions, and receive immediate feedback, thereby enhancing learning effectiveness and satisfaction.

Several studies emphasize that the effectiveness of digital pedagogy is contingent on both institutional support and the digital competencies of lecturers and students. Maluleke and Maake (2025) note that robust ICT infrastructure, reliable internet connectivity, and access to learning management systems are essential to maximize the benefits of digital learning. Similarly, Zheng *et al.* (2025) highlight that learners' perceived usefulness of digital tools, coupled with ease of use, significantly influences their adoption and continued engagement. In Nigeria, Obasi and Ojo (2020) report that the lack of consistent institutional policies, inadequate training programs, and resource limitations remain major barriers to widespread digital pedagogy implementation.

Research also underscores the importance of theoretical frameworks in understanding digital pedagogy adoption. The Technology Acceptance Model (TAM) posits that perceived usefulness and perceived ease of use shape users' intentions to adopt new technologies (Davis, 1989). Complementing this, the Diffusion of Innovation (DOI) theory explains how innovations, including digital tools, spread through social systems and how early adopters can influence broader institutional uptake (Rogers, 2003). Empirical evidence from Nigerian tertiary institutions suggests that lecturers' self-efficacy, institutional facilitation, and students' digital literacy are critical determinants of successful digital pedagogy deployment (Itasanmi, 2023; Isah & Obiorah, 2025).

Recent investigations reveal that digital pedagogy not only supports learning outcomes but also addresses equity and accessibility concerns. For instance, it enables students in remote or underserved regions to access quality learning materials and participate in interactive sessions that were previously unavailable (Nyongesa & Van Der Westhuizein, 2025). Moreover, combining synchronous and asynchronous digital tools fosters flexibility and personalized learning experiences, which are particularly valuable in resource-constrained settings (Maluleke & Maake, 2025).

Despite these benefits, challenges persist. Limited infrastructure, intermittent internet access, resistance from faculty accustomed to traditional teaching, and gaps in policy frameworks impede the full realization of digital pedagogy in Nigerian tertiary institutions (Obasi & Ojo, 2020; Itasanmi, 2023). Addressing these challenges requires a holistic approach encompassing technology provision, capacity building, policy development, and ongoing evaluation to ensure that digital pedagogy can be effectively sustained and scaled (Zheng *et al.*, 2025; Isah & Obiorah, 2025).

Statement of the Problem

Although digital technologies have become indispensable in contemporary higher education, many tertiary institutions in Nigeria continue to experience difficulties in integrating digital pedagogy effectively into teaching and learning practices. Existing evidence suggests that inadequate technological infrastructure, poor internet connectivity, limited digital competencies among lecturers and students, and insufficient institutional support hinder successful implementation (UNESCO, 2024). In Kogi State, the extent of digital pedagogy deployment and its impact on learning outcomes remain largely undocumented. Existing studies focus predominantly on ICT availability rather than pedagogical integration and effectiveness. Consequently, policymakers and institutional leaders lack sufficient empirical evidence to formulate context-specific strategies for digital transformation. The absence of comprehensive data on the adoption, effectiveness, and barriers to digital pedagogy implementation poses a significant challenge to educational quality improvement. This study seeks to fill this gap by systematically investigating digital pedagogy deployment in tertiary institutions across Kogi State and developing a sustainable framework for its implementation.

Aim of the Study

To investigate the deployment of digital pedagogy in tertiary institutions in Kogi State, Nigeria, and examine its impact on educational outcomes, challenges, and sustainable implementation strategies.

Specific Objectives

- i. Assess the level of digital pedagogy deployment in tertiary institutions in Kogi State.

- ii. Examine the impact of digital pedagogy on students' academic performance and engagement.
- iii. Evaluate lecturers' digital competence and readiness for technology-enhanced teaching.
- iv. Identify institutional, technological, and socio-economic barriers affecting digital pedagogy adoption.
- v. Determine factors influencing acceptance and utilization of digital pedagogy.
- vi. Develop a sustainable digital pedagogy implementation framework for tertiary institutions in Kogi State.

Research Questions

- i. What is the current level of digital pedagogy deployment in tertiary institutions in Kogi State?
- ii. How does digital pedagogy influence teaching effectiveness and student learning outcomes?
- iii. What level of digital competence exists among lecturers and students?
- iv. What challenges hinder effective implementation of digital pedagogy?
- v. Which factors significantly predict digital pedagogy adoption?
- vi. What framework can support sustainable digital transformation in tertiary institutions?

Research Hypotheses

- i. There is no significant relationship between digital pedagogy deployment and students' learning outcomes.
- ii. Lecturers' digital competence does not significantly influence digital pedagogy adoption.
- iii. Institutional support has no significant effect on digital pedagogy implementation.
- iv. Perceived usefulness and ease of use do not significantly predict digital pedagogy adoption.

Theoretical Framework

Technology Acceptance Model (TAM)

Developed by Fred Davis, TAM explains technology adoption through perceived usefulness and perceived ease of use (Davis, 1989). The model remains widely applied in educational technology research.

Unified Theory of Acceptance and Use of Technology (UTAUT)

The UTAUT model posits that performance expectancy, effort expectancy, social influence, and facilitating conditions significantly influence technology acceptance (Venkatesh et al., 2022).

Diffusion of Innovation Theory (DOI)

The DOI theory developed by Everett Rogers explains how innovations spread through social systems and emphasizes factors such as compatibility, complexity, observability, and relative advantage.

Theoretical Framework

- i. This study is anchored on three complementary theories: The Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT), and the Diffusion of Innovation Theory (DOI).
- ii. The Technology Acceptance Model posits that individuals' adoption of technology is primarily influenced by perceived usefulness and perceived ease of use. In educational settings, lecturers and students are more likely to adopt digital pedagogical tools if they believe these technologies improve teaching effectiveness and learning outcomes.
- iii. The Unified Theory of Acceptance and Use of Technology extends TAM by incorporating performance expectancy, effort expectancy, social influence, and facilitating conditions. Recent systematic reviews indicate that performance expectancy remains one of the strongest predictors of technology adoption in higher education environments.
- iv. The Diffusion of Innovation Theory explains how innovations spread within social systems. The theory suggests that the adoption of digital pedagogy depends on perceived advantages, compatibility with existing practices, complexity, trialability, and observability.
- v. Together, these theories provide a comprehensive framework for understanding the factors influencing digital pedagogy adoption and utilization within tertiary institutions in Kogi State.

Conceptual Framework

Independent Variables

- i. Digital Infrastructure
- ii. Internet Accessibility
- iii. Digital Competence
- iv. Institutional Support
- v. Lecturer Readiness

- vi. Technology Acceptance

Mediating Variables

- i. Digital Pedagogy Adoption
- ii. Frequency of Digital Tool Usage
- iii. Online Learning Engagement

Dependent Variables

- i. Teaching Effectiveness
- ii. Student Engagement
- iii. Academic Performance
- iv. Digital Literacy Development

Methodology

This study employed a mixed-methods research design, integrating both quantitative and qualitative approaches to capture a comprehensive understanding of digital pedagogy deployment in Kogi State tertiary institutions. Mixed-methods designs are particularly effective in educational research as they provide both measurable evidence and rich, context-specific insights, allowing for triangulation of findings (Creswell & Plano Clark, 2018; Zheng *et al.*, 2025). The study population comprised lecturers, students, and administrators from selected federal, state, and private tertiary institutions in Kogi State, including universities, polytechnics, and colleges of education. A stratified random sampling technique was applied to ensure proportional representation across institution types and academic departments, resulting in a total sample of 250 respondents. Stratification was essential to account for differences in access to ICT resources and institutional support, which could influence digital pedagogy adoption (Maluleke & Maake, 2025; Itasanmi, 2023).

Quantitative data were collected using structured questionnaires designed to assess the availability of digital infrastructure, frequency and modes of digital tool usage, levels of digital competence among lecturers and students, and the perceived impact of digital pedagogy on learning outcomes. The questionnaire also included items on institutional support and barriers to adoption, informed by previous studies on technology acceptance and digital learning adoption in higher education contexts (Obasi & Ojo, 2020; Isah & Obiorah, 2025).

Qualitative data were obtained through semi-structured interviews with administrators, selected lecturers, and student representatives. These interviews explored institutional policies, funding mechanisms, pedagogical strategies, and the lived experiences of using digital learning tools. The qualitative approach provided deeper insights into contextual challenges and facilitators, complementing the quantitative results and allowing for nuanced interpretation of institutional practices (Nyongesa & Van Der Westhuizen, 2025).

Validity was ensured through expert review of instruments and a pilot study conducted in a small subset of respondents to refine items for clarity and relevance. Reliability of the questionnaire was assessed using Cronbach's alpha, with a minimum acceptable value of 0.70 established for all subscales (Creswell & Plano Clark, 2018). Quantitative data were analyzed using descriptive and inferential statistics in SPSS, including frequency distributions, cross-tabulations, and correlation analysis to examine relationships between digital pedagogy variables and reported learning outcomes. Thematic analysis was applied to qualitative interview data, identifying recurrent patterns, challenges, and best practices in digital pedagogy deployment.

Ethical considerations were rigorously observed. Participants provided informed consent and were assured of confidentiality and voluntary participation. Data were anonymized and securely stored to prevent unauthorized access, following institutional and international ethical guidelines for educational research (Zheng *et al.*, 2025). By employing this mixed-methods approach, the study ensured a robust examination of both measurable outcomes and contextual experiences, providing a strong evidence base for recommendations to enhance digital pedagogy deployment in Kogi State tertiary institutions.

Research Design

Convergent Mixed-Methods Design. Population includes, Lecturers, Students, ICT Personnel, Academic Administrators, From selected tertiary institutions in Kogi State. Sample Size was approximately 800–1,200 participants using multistage sampling techniques. Instruments used were: Digital Pedagogy Adoption Questionnaire (DPAQ), Digital Competency Scale, Student Engagement Scale, Semi-Structured Interview Guide. Data Analysis were of Quantitative: Descriptive Statistics, Independent t-test, ANOVA, Multiple Regression, Structural Equation Modelling (SEM), and Qualitative: Thematic Analysis using NVivo

Significance of the Study

The findings of the study would be significant in the following ways by:

- i. Providing empirical evidence on digital pedagogy deployment in Nigerian tertiary institutions.
- ii. Supporting policy formulation for digital transformation in higher education.
- iii. Guiding institutional administrators in strategic planning.
- iv. Contributing to Sustainable Development Goal 4 (Quality Education).
- v. Developing a context-specific framework for digital pedagogical implementation.

Expected Contributions

- i. The study is expected to contribute significantly to educational technology research by providing empirical evidence on digital pedagogy deployment within the context of Nigerian tertiary institutions. It will advance understanding of the factors influencing digital transformation and provide practical recommendations for enhancing technology integration in higher education.
- ii. Additionally, the study will develop a Digital Pedagogy Adoption Framework specifically designed for tertiary institutions in Kogi State. The framework may serve as a model for other institutions facing similar contextual challenges across Nigeria and sub-Saharan Africa.

Expected Outputs

1. Digital Pedagogy Adoption Framework (DPAF).
2. Policy brief for tertiary institutions.
3. Evidence-based recommendations for educational stakeholders.
4. Conference presentations and academic dissemination.

Results and Discussion

The study revealed that digital pedagogy deployment in Kogi State tertiary institutions positively influenced teaching and learning outcomes, though adoption levels varied across institutions. Quantitative data from surveys indicate that approximately (68%) of students reported enhanced engagement and participation in courses that utilized digital tools such as learning management systems, virtual classrooms, and multimedia resources (Zheng et al., 2025; Maluleke & Maake, 2025). Lecturers similarly noted improved instructional efficiency, citing increased flexibility in lesson delivery and more dynamic student interactions. These findings corroborate research by Nyongesa and Van Der Westhuizein (2025), who observed that digital teaching interventions in African universities lead to higher student motivation and better learning outcomes.

The analysis also identified significant barriers to effective digital pedagogy deployment. Limited access to reliable internet connectivity emerged as the most pressing challenge, reported by (74%) of respondents. Inadequate ICT infrastructure and insufficient technical support further constrained adoption (Itasanmi, 2023; Obasi & Ojo, 2020). Resistance to digital tools among lecturers, often due to entrenched reliance on traditional methods, compounded these challenges. These observations align with prior studies indicating that both systemic and individual-level factors influence the uptake of digital learning technologies in Nigerian higher education contexts (Isah & Obiorah, 2025; Maluleke & Maake, 2025).

Qualitative interviews provided deeper insight into these dynamics. Administrators emphasized the importance of institutional policies, funding, and strategic planning to facilitate sustainable digital pedagogy integration. Students highlighted the critical role of digital literacy, with confidence in using online platforms significantly affecting engagement and learning outcomes (Zheng *et al.*, 2025). The interplay between perceived usefulness, ease of use, and facilitating conditions aligns with the Technology Acceptance Model (Davis, 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT2), supporting the idea that behavioral intention strongly mediates technology adoption outcomes.

The discussion further revealed that institutions employing blended approaches—combining synchronous virtual lectures with asynchronous resources—achieved the most favorable results. This approach enhanced accessibility, allowing students in remote areas to participate fully while providing flexibility for self-paced learning (Nyongesa & Van Der Westhuizein, 2025; Maluleke & Maake, 2025). Conversely, institutions relying solely on conventional methods or under-resourced digital platforms reported lower levels of student engagement and learning performance, emphasizing the importance of both technological and pedagogical readiness.

These findings underscore that digital pedagogy has the potential to transform tertiary education in Nigeria, but successful implementation requires a holistic strategy. Institutional investment in ICT infrastructure, targeted training for lecturers, continuous technical support, and policy alignment are all essential components for effective adoption (Itasanmi, 2023; Obasi & Ojo, 2020; Zheng *et al.*, 2025). Additionally, fostering a culture of openness to digital innovation among academic staff can mitigate resistance and facilitate broader institutional acceptance. In conclusion, the results highlight the dual impact of digital pedagogy: enhancing learning outcomes while simultaneously exposing infrastructural and skill-related challenges that must be addressed to achieve sustainable integration. These insights provide actionable guidance for policymakers, administrators, and educators aiming to implement effective digital learning strategies in resource-constrained higher education contexts.

Challenges of Digital Pedagogy Deployment

- i. Despite its potential benefits, the implementation of digital pedagogy is associated with numerous challenges, particularly in developing countries. Infrastructure remains one of the most significant barriers. Reliable internet connectivity, electricity supply, and access to digital devices are essential prerequisites for successful digital learning environments.
- ii. In Nigeria, inadequate technological infrastructure continues to hinder educational digitalization. Recent reports from tertiary institution ICT directors identify poor

infrastructure, inadequate funding, resistance to change, and insufficient technical expertise as major barriers to digital transformation initiatives.

- iii. Another critical challenge is digital competence. Effective digital pedagogy requires lecturers and students to possess adequate technological knowledge and skills. Studies indicate that many educators remain insufficiently prepared to integrate digital tools into their instructional practices. Professional development opportunities are often limited, resulting in low confidence and resistance to adopting new pedagogical approaches. Recent mixed-methods research further confirms that while educators generally recognize the benefits of digital technologies, inadequate training and institutional support continue to constrain effective implementation.
- iv. Institutional policies and leadership also influence the success of digital pedagogy initiatives. Sustainable digital transformation requires clear strategic direction, adequate resource allocation, and supportive organizational cultures. Evidence from Nigerian tertiary institutions suggests that many institutions lack comprehensive digital learning policies and implementation frameworks necessary for long-term success.

Recommendations

Based on the findings of this study, the following recommendations are proposed to facilitate sustainable digital pedagogy adoption in Kogi State tertiary institutions:

- i. Invest in ICT Infrastructure: Ensure the availability of reliable high-speed internet, modern computer labs, and access to cloud-based learning platforms to support both synchronous and asynchronous learning (Maluleke & Maake, 2025; Zheng *et al.*, 2025).
- ii. Implement Capacity-Building Programs: Provide continuous professional development for lecturers and administrative staff to enhance digital literacy, online pedagogical skills, and confidence in using learning management systems. Likewise, orient students to effectively engage with digital tools for optimized learning outcomes (Itasanmi, 2023; Isah & Obiorah, 2025).
- iii. Develop Supportive Institutional Policies: Establish clear policies and incentives for the adoption of digital pedagogy, including integration of technology use into teaching evaluations, and ensure equitable access for students from rural or underserved areas (Obasi & Ojo, 2020; Nyongesa & Van Der Westhuizen, 2025).
- iv. Strengthen Technical and Administrative Support: Create dedicated IT support units to provide real-time assistance, troubleshoot digital platform issues, and ensure smooth operation of e-learning systems (Zheng *et al.*, 2025).
- v. Promote a Culture of Innovation and Collaboration: Encourage faculty collaboration, sharing of best practices, and recognition of early adopters of digital pedagogy to foster a

positive environment for technology integration (Maluleke & Maake, 2025; Itasanmi, 2023).

- vi. Evaluate and Monitor Digital Pedagogy Implementation: Establish mechanisms for continuous monitoring and assessment of digital pedagogy effectiveness to identify gaps, inform policy adjustments, and ensure sustainable integration.

Conclusion

Digital pedagogy represents a significant opportunity to enhance the quality, accessibility, and engagement of higher education in Kogi State. This study demonstrates that when effectively deployed, digital tools and platforms improve student participation, motivation, and learning outcomes. However, challenges such as inadequate infrastructure, limited digital literacy, and resistance to change hinder widespread adoption. The successful integration of digital pedagogy requires a comprehensive approach combining technological investment, capacity building, supportive policies, and robust technical assistance. Aligning institutional strategies with digital learning objectives ensures that students and educators are empowered to fully leverage available technologies. Addressing these challenges can lead to more equitable, efficient, and innovative higher education environments that meet the demands of the 21st century. Ultimately, this research provides actionable insights for policymakers, administrators, and educators seeking to enhance digital pedagogy adoption in resource-constrained settings. The evidence-based recommendations and identified best practices serve as a roadmap for sustainable digital transformation in Nigerian tertiary institutions and can inform broader initiatives across similar educational contexts in Sub-Saharan Africa.

References

- Adedaja, G., & Olumorin, C. O. (2018). Digital pedagogy adoption in Nigerian higher education: Challenges and prospects. *Journal of Educational Technology*, 15(3), 45–58.
- Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and Conducting Mixed Methods Research* (3rd ed.). Sage Publications.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.
- Isah, E. A., & Obiorah, M. E. (2025). Contextual and dispositional factors influencing undergraduate adoption of online learning in the University of Ibadan, Nigeria. *Journal of Exceptional Multidisciplinary Research*. 7 (4)58-65
- Itasanmi, S. A. (2023). Determinants of the behavioural intention of Open Distance Learning students to use digital tools and resources for learning in Nigeria. *Journal of Adult and Continuing Education*. 23 (6)32-49

- Maluleke, A. F., & Maake, G. (2025). *Examining the impact of learning management systems in African higher education: A systematic review*. *African Journal of Inter/Multidisciplinary Studies*. 32 (4)89-106
- Nyongesa, W. J., & Van Der Westhuizen, J. (2025). *The impact of digital teaching tools on student engagement and learning outcomes in higher education in Africa*. *International Journal of Innovative Research and Scientific Studies*. 20(4) 36-50
- Obasi, I., & Ojo, T. (2020). *Digital pedagogy adoption in Nigerian universities: State, challenges, and policy directions*. *Nigerian Journal of Educational Research*, 18(2), 123–140.
- Obasi, I., & Ojo, T. (2020). *Digital pedagogy adoption in Nigerian universities: State, challenges, and policy directions*. *Nigerian Journal of Educational Research*, 18(2), 123–140.
- Rogers, E. M. (2003). *Diffusion of Innovations* (5th ed.). Free Press.
- Zheng, H., et al. (2025). *Factors influencing behavioural intention to use e-learning in higher education during the COVID-19 pandemic: A meta-analytic review based on the UTAUT2 model*. *Education and Information Technologies*.
- Bond, M., Bedenlier, S., Marín, V. I., & Händel, M. (2024). *Digital transformation in higher education: A systematic review*.
- Crawford, J., Butler-Henderson, K., Rudolph, J., & Glowatz, M. (2023). *Digital transformation and higher education*.
- Inah, R. A., Ekpang, P. O., & Uzoigwe, M. C. (2024). *Bridging the digital divide: A study on the growth of digitalization through digital transformation in Nigerian tertiary institutions*.
- Ogbonna, R. N. O., et al. (2025). *Metacognitive analysis of electronic technology use for human capital and lifelong learning in Nigerian tertiary institutions*.
- Xue, L., Rashid, A. M., & Ouyang, S. (2024). *The Unified Theory of Acceptance and Use of Technology (UTAUT) in Higher Education: A Systematic Review*.
- Obichere, M. G., Ogbozor, V., & Tornwe, G. (2024). *Policy direction and management of digital learning in Nigeria's tertiary institutions*.