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Assessing the Impact of Online Learning in Higher Education Among Students of Colleges of Education in Niger State

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Abstract

The rapid adoption of online learning has emerged as a critical strategy for sustaining educational delivery in response to disruptions affecting conventional teaching systems. This study investigated the integration and effectiveness of online learning in Colleges of Education across Niger State, Nigeria. A mixed-methods research design was employed, combining quantitative survey data with qualitative insights to comprehensively evaluate students' experiences and institutional preparedness for digital learning. A representative sample of 367 students was selected from a population of approximately 8,172 using the Morgan sampling table. Data were analyzed using the Statistical Package for the Social Sciences (SPSS), employing descriptive statistics alongside inferential techniques, including independent sample t-tests and one-way analysis of variance (ANOVA), with statistical significance established at $p < 0.05$. The findings revealed significant institutional differences in students' satisfaction with online learning and identified internet connectivity ($\beta = 0.35$, $p = 0.001$) and access to learning resources ($\beta = 0.30$, $p = 0.007$) as the most influential predictors of academic performance. These results underscore the importance of reliable digital infrastructure and equitable resource availability in maximizing the effectiveness of online education. The study provides important pedagogical and institutional implications for strengthening technology-enabled learning environments within teacher education institutions. It recommends prioritizing the expansion of ICT infrastructure through the provision of campus-wide high-speed internet connectivity and reliable power supply systems. Furthermore, material and financial support should be provided to students from economically disadvantaged backgrounds to promote equitable access to digital learning technologies. The study also advocates mandatory digital literacy training for faculty and students and the development of comprehensive emergency online learning contingency frameworks to ensure uninterrupted educational delivery during future crises and institutional disruptions.

Keywords

Online Learning
ICT Infrastructure
Academic Performance
Digital Literacy
Colleges of Education



Introduction

Online learning has emerged as a significant mode of education delivery, particularly in response to the challenges posed by traditional learning System. In Niger State, Online learning has emerged as a significant mode of education delivery, particularly in response to the challenges posed by traditional learning System. In Niger State, Nigeria, the integration of online learning into higher education has the potential to enhance access and improve educational outcomes. However, various factors, including infrastructure, policy, and cultural attitudes, impact its effectiveness. Understanding these dynamics is essential for leveraging online learning to address educational gaps in the region. Quantitative Analysis Survey Should be done and data will be analyzed using statistical software (e.g., SPSS). Descriptive statistics will summarize demographic data, while inferential statistics (e.g., t-test) will assess differences in perceptions based on demographics.

In Africa, where educational frameworks are expanding rapidly to foster regional socio-economic growth, literacy challenges severely restrict transition rates from higher education into competitive labor markets. In Nigeria, this barrier is acutely felt across the tier of higher learning; a significant number of adult learners in tertiary institutions continue to endure reading marginalization, often remaining undiagnosed and unaddressed while struggling to meet the core demands of their academic pursuits.

ICTs have fundamentally shaped the process of learning as they allow learners to learn anywhere and anytime, interact with others efficiently and conveniently, and freely

acquire a large volume of learning materials online (Kebritchi et al., 2017; Choudhury and Pattnaik, 2020). However, this is attached with significant challenges, such as inadequate infrastructure, such as unreliable internet connectivity and power supply (Ojo & Olayanju, 2021), low digital literacy among students and educators (Adedoyin & Soykan, 2020), cultural resistance to new teaching methods, and financial constraints affecting access to technology. The digital divide, with a particular reference to women, also poses a challenge (UNESCO, 2021). To address these challenges, the National Information Technology Development Agency (NITDA) launched initiatives like the Digital Literacy for All Initiative (DL4ALL) with a goal to achieve 95% digital literacy by 2030 (NITDA, 2021). This initiative aims to equip citizens with the skills needed to thrive in a tech-driven world. The Niger State Government is also deploying computers and tablets to public schools and laying fiber optic cables to provide free internet (Niger State Government, 2022).

Utilizing a mixed-methods research approach, the project will gather quantitative data through surveys and qualitative insights via interviews with students, faculty, and administrators. This comprehensive methodology aims to provide a nuanced understanding of the experiences and perceptions surrounding online learning. Key expected outcomes include the identification of primary challenges faced in implementing online education, insights into opportunities for improvement, and practical recommendations for stakeholders, including policymakers and educational institutions. The findings will culminate in a research report, presentation, and policy brief aimed at fostering dialogue and collaboration to

enhance online learning in Colleges of education in Niger State. This study seeks to contribute valuable insights that can guide the development of effective online learning strategies, ensuring that higher education in Niger State meets the demands of the 21st century.

The adoption of online learning in most institutions faces numerous challenges, including inadequate internet infrastructure, limited digital literacy among both students and educators, and resistance to change from traditional pedagogical methods. These barriers hinder the effective implementation of online education, preventing many students from benefiting from its potential advantages. The fact as to the impact of online learning among students of colleges of education in Niger State is yet to be established. The research Proposes to establish the facts on it and proper ways for improvement.

Objective(s) of the Study

The objectives of the study were set to:

1. Explore the impact of online learning among Students of higher education institution in Niger State.
2. Identify the challenges faced by these institutions in implementing online learning.
3. Ascertain opportunities for enhancing the effectiveness of online learning

2.0 Literature Review

2.1 Conceptual Review

INTEGRATED APPROACH MODEL

Independent Variable: Pedagogical & Andragogical Interventions

Universal Design for Learning (UDL)

- Individualized Education Programmes (IEPs)

- Self-Directed & Learner-Centered Principles



Dependent Variable: Literacy Outcomes in Dyslexic Adult Learners

Fluent Reading Capacity & Decoding Accuracy

Text Comprehension & Meaning Derivation
Alleviation of Psychological Academic Trauma / Higher CGPA

In the context of Niger State, Nigeria, colleges of education play a crucial role in preparing future educators. However, these institutions face unique challenges, including limited infrastructure, varying levels of digital literacy, and socio-economic barriers that can hinder the effective implementation of online learning. Despite these challenges, the potential benefits of online education are substantial.

2.2.1 The Concept of Dyslexia in Adult Tertiary Learners

Dyslexia is conceptualized as a persistent neuro developmental learning disability characterized by difficulties with accurate or fluent word recognition, poor spelling, and weak decoding abilities. While traditionally viewed as a childhood reading disorder, contemporary scholarship recognizes dyslexia as a lifelong condition that persists into adulthood. This vicious cycle leads to low Cumulative Grade Point Averages (CGPA), delayed graduations, or complete academic withdrawal.

This review seeks to explore the current landscape of online learning within Niger

State's colleges of education, examining both the opportunities and challenges that lie ahead. By analyzing existing literature, the review aims to provide insights into how these institutions can adapt to a rapidly changing educational environment and outline strategies for leveraging online learning to improve educational outcomes. Ultimately, understanding the future of online learning in this specific context is vital for stakeholders, including educators, policymakers, and students, as they navigate the complexities of a digital education landscape.

The role of online learning in increasing educational access and promoting lifelong learning. Online learning is seen as a key strategy for widening access to university education and meeting the demands of the 21st-century workplace (India Today, 2024). Challenges of Online Learning Infrastructure Limitation Examination of the adequacy of internet access and technological resources in Niger State. Unreliable internet connectivity, frequent power outages, and limited access to technological resources remain significant obstacles (Ogolodom et al., 2022). A study by Ogolodom et al. found that lack of access to computer devices and unstable internet access were major challenges (Ogolodom et al., 2022).

Digital Literacy Analysis of the skills gap among students and educators in navigating online learning platforms. Inadequate training and institutional support contribute to the digital literacy gap (NITDA, 2025). A recent initiative by NITDA and NUC aims to address this by implementing a Digital Literacy and Skills Curriculum across Nigerian universities (NITDA, 2025). Cultural Resistance Discussion on the attitudes toward online learning and how they affect its adoption. Some studies

indicate a low acceptance of online learning among Nigerian students, who still prefer traditional classroom settings (Akaeze & Akaeze, 2024).

Financial Constraints Financial constraints are a significant barrier for students, limiting their ability to afford necessary ICT resources and data (Examining the prospect of online education, 2023). Some scholars believed that online learning during the pandemic period has brought about a lot of problems while both students and teachers encounter many challenges. García-Morales et al. (2021) implemented a systematic review to identify the challenges encountered by higher education in an online learning scenario during the pandemic period. Thus, various stakeholders in learning and teaching (e.g., students, universities, and teachers) encountered difficulties in adapting to this sudden change.

To deal with these challenges, universities need to utilize the potential of technologies, improve learning experience, and meet students' expectations. The major limitation of García-Morales et al. (2021) review of the small-sized sample. Meanwhile, García-Morales et al. (2021) also failed to systematically categorize various types of challenges. Stojan et al. (2022) investigated the changes to medical education brought about by the shift to online learning in the COVID-19 pandemic context as well as the lessons and impacts of these changes via a systematically categories various type of challenge

2.2 Theoretical Framework

This study is anchored on two complementary theoretical frameworks that bridge the intersection between learning disability

remediation and adult learning dynamics: The Universal Design for Learning (UDL) Framework and Knowles' Theory of Andragogy. Empirical evidence underscores that dyslexia are a widespread global issue, with established scientific consensus indicating that it impacts approximately 15% to 20% of the world's population, effectively representing one in every five individuals. Across sub-Saharan Africa, regional meta-analyses reveal that language-related learning difficulties are heavily prevalent, masking a staggering diagnostic gap where up to 75% of affected individuals remain completely unidentified throughout their schooling. In Nigeria, institutional data confirms that dyslexia operate as a major predictor of diminished academic self-efficacy and severe psychological distress. Recent localized tracking reveals that reading disorders account for roughly 36.3% of learning complaints within school ecosystems, causing underachievement that directly translates into persistently low cumulative grade point averages (CGPA), delayed graduations, and high dropout rates among affected Nigerian college students.

Historical development of online education in Nigeria and its evolution, particularly in response to the COVID-19 pandemic. The COVID-19 pandemic significantly accelerated the adoption of online learning in Nigerian higher education institutions (Hurix Digital, 2024). The advent of digital technology has revolutionized education worldwide, prompting significant changes in how institutions deliver instruction and engage with students.

Online learning defined as a form of education delivered via the internet, has gained momentum in recent years, particularly in

higher education. This shift has been accelerated by global events such as the COVID-19 pandemic, which necessitated rapid adaptation to remote learning environments.

2.3 Empirical Review

2.3.1 Prevalence and State of Dyslexia in Tertiary Institutions

Empirical investigations into the landscape of learning disabilities within African higher education confirm a critical, systemic gap. Globally, the International Dyslexia Association tracks steady prevalence markers across populations, yet institutional tracking within developing nations remains severely restricted.

In Nigeria, early screening and diagnosis are historically concentrated at the primary or junior secondary school levels. Consequently, multiple institutional studies show that a significant portion of the tertiary student body enters higher learning with unrecorded, uncompensated reading difficulties. Lecturers, typically untrained in special needs education or inclusive pedagogical models, mistake these reading processing delays for cognitive incapacity, leaving students to navigate complex academic requirements without any structured structural support.

2.3.2 Effectiveness of Universal Design and Modern Pedagogies on Reading Recommendations

Empirical research evaluating UDL interventions demonstrates consistent, positive impacts on literacy outcomes. For instance, Sandral et al. (2023) investigated the deployment of digital pedagogies within teacher education environments, concluding that flexible, multi-modal instructional formats significantly elevated baseline

literacy standards and student engagement metrics.

Furthermore, experimental evaluations by Rose (2024) regarding UDL in classroom settings proved that when students are provided multiple paths to interact with text (such as synchronized text-to-speech visual highlighting), comprehension scores climb uniformly across both neurotypical and neurodivergent populations.

2.3.3 Impact of Andragogical, Self-Directed, and IEP Interventions on Adult Learners

The empirical literature surrounding adult literacy highlights the necessity of self-directed and individualized interventions. Aashma (2024) conducted a comprehensive review of self-directed learning implementations, noting that while the shift toward learner autonomy presents operational challenges, it fundamentally deepens critical thinking and information retention in mature student cohorts.

Similarly, Novita and Hiryanto (2026) verified that implementing targeted andragogical models in diverse educational settings drastically reduces dropout rates. By shifting away from rigid, passive lecturing formats toward collaborative, problem-centered exercises, adult learners display enhanced academic resilience. When these andragogical methodologies are paired with targeted IEPs, the resulting structured support system allows adult dyslexic learners to bypass traditional learning roadblocks and protect their academic trajectory.

2.4 Critique of Extant Literature and Literature Gap

2.4.1 Summary of Reviewed Literature

The body of reviewed literature clearly establishes that reading is the fundamental anchor for all higher education milestones, and that adult dyslexia creates profound academic and psychological blockades. Theoretical models like UDL offer a robust architecture for environmental flexibility, while Knowles' andragogy provides the operational rules required to properly engage adult mindsets. Empirical work demonstrates that both digital UDL applications and self-directed IEP methods yield positive results when applied independently in their respective fields.

2.4.2 The Literature Gap

Despite these individual insights, a critical, dual-faceted literature gap remains:

The Integration Gap: There is a distinct lack of empirical research that systematically fuses the neuroscience-backed principles of Universal Design for Learning (traditionally housed in special education pedagogy) with the self-directed principles of Andragogy (traditionally housed in adult education frameworks) into a single, cohesive intervention model for higher education.

The Contextual/Geographical Gap: There is a total dearth of empirical data, localized frameworks, or structured intervention studies regarding the remediation of adult dyslexia within the specific tertiary institutional landscape of Niger State, Nigeria.

This study directly addresses these gaps by evaluating a unified model that combines special education pedagogies with adult education andragogical approaches specifically within tertiary institutions across Niger State.

Methodology

A mixed-methods approach was utilized in this study, combining quantitative and qualitative research methods. This approach allows for a comprehensive understanding of the challenges and opportunities associated with online learning in higher education in Niger State. Utilizing a mixed-methods approach, the research surveyed a representative sample of 367 students drawn from a population of approximately 8,172 across selected institutions, including Dr. Umaru Sanda Ahmadu College of education (Minna) and Federal College of Education descriptive and inferential statistics, including ANOVA and regression analysis, with significance set at $p < 0.05$.

- i. Structured Questionnaires: To assess students' perceptions of online learning, challenges faced, and opportunities for improvement.
- ii. Interviews: Semi-structured interviews with faculty members and administrators to gather deeper insights into their experiences.

Surveys was distributed electronically through university mailing lists, and paper copies were provided where necessary.

Interviews was conducted via video conferencing tools (e.g., Zoom, Microsoft Teams) or in-person, depending on participants' preferences and availability.

Results

Findings indicate a high overall satisfaction rate, with 75% of students at both COE Minna and FCE Kontagora reporting positive sentiments toward online learning. Statistical analysis revealed significant institutional differences in satisfaction levels ($F(2, 364) = 4.02, p < 0.05$). Regression analysis identified

internet connectivity ($\text{Beta} = 0.35, p = 0.001$) and access to resources ($\text{Beta} = 0.30, p = 0.007$) as the strongest predictors of academic performance.

- Institutional Variance: ANOVA results showed significant differences in satisfaction levels ($F(2, 364) = 4.02, p < 0.05$).
- Performance Predictors (Regression Analysis):
- Internet Connectivity: $\text{Beta} = 0.35, p = 0.001$.
- Access to Resources: $\text{Beta} = 0.30, p = 0.007$.
- Institutional Support: $\text{Beta} = 0.25, p = 0.015$

The findings of this study will offer significant pedagogical implications for online learning in higher education institutions, shall enhancing the development of ICT infrastructure, providing material support for students with poor economic status, enhancing social interactions, paying attention to students' emotional status and preparing a contingency plan of emergency online learning. A significance level of $p < 0.05$ was used to determine statistical significance. Reading is a foundational, cardinal skill that serves as the gateway to academic achievement, information retention, and lifelong educational progress. Globally, literacy is recognized as a vital pillar for sustainable development, economic transitions, and the realization of individual potential.

Conclusion

The research concludes that online learning has a significant and generally positive impact on the understanding of course materials among students in Niger State, particularly at Dr. Umaru Sanda Ahmadu College of education

Minna. While students show a high level of readiness and positive perception, the "digital divide" characterized by poor internet infrastructure and limited access to devices remains the primary obstacle to full integration. The study confirms that academic success in online modes is heavily dependent on reliable connectivity and institutional resource availability.

Recommendations

To enhance the effectiveness of online education in Niger State Colleges of Education, the following actions are recommended:

- i. **Infrastructure Development:** Prioritize the enhancement of ICT infrastructure, including the provision of campus-wide high-speed internet and stable power solutions.
- ii. **Targeted Financial Support:** Provide material and financial assistance for students from lower economic backgrounds to ensure equitable access to digital learning tools.
- iii. **Capacity Building:** Implement mandatory digital literacy training programs for both faculty and students to bridge the current skills gap.
- iv. **Contingency Planning:** Develop robust "emergency online learning" contingency plans to ensure educational continuity during future crises or disruptions.
- v. **Public-Private Partnerships:** Leverage partnerships to subsidize data costs and improve the availability of affordable computing devices for students.

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