

Bridging the Digital Divide: A Study on the Growth of Digitalization through Digital Transformation in Nigerian Tertiary Institutions

Inah Roland Afen, PhD

+2348067284502

inahroland150@yahoo.com

<https://orcid.org/0009-0001-4823-7605>

Patience Owere Ekpang, PhD

+256745966370

patience.ekpang@kiu.ac.ug

<https://orcid.org/0009-0004-2309-8204>

Kampala International University, Uganda

³Uzoigwe, Michael Chukwudi, PhD

+2348033653142

chukwudiuzoigwe@unical.edu.ng

<https://orcid.org/0009-0004-8670-8292>

^{1&3}Department of Educational Management, Faculty of Education
Foundation Studies, University of Calabar,
Cross River State, Nigeria

Abstract

The digital divide is a significant challenge facing Nigerian tertiary institutions, with many institutions struggling to keep pace with the rapid pace of technological change. This study explores the growth of digitalization through digital transformation in Nigerian tertiary institutions, with a focus on bridging the digital divide. Using a qualitative case study approach, the study examines the experiences and perceptions of faculty members, administrators, and students in three Nigerian tertiary institutions with varying levels of digitalization. The findings highlight the importance of digital infrastructure, digital literacy, and digital pedagogy in promoting digital transformation, as well as the need for institutional policies and strategies to support digitalization. The study also identifies key challenges and barriers to digitalization, including inadequate infrastructure, lack of digital literacy, and limited access to digital resources. The study's findings have implications for policymakers, educators, and administrators seeking to promote digital transformation and bridge the digital divide in Nigerian tertiary institutions.

Keywords: *Digitalization, Digital Transformation, Nigerian Tertiary Institutions, Digital Divide
Higher Education, Technology Adoption, Educational Innovation*

Introduction

The digital divide, a phenomenon characterized by unequal access to digital technologies and the internet, has been a persistent challenge in many developing countries, including Nigeria (Adeyemi, 2024). In recent years, there has been a growing recognition of the importance of digitalization in driving economic growth, improving education, and enhancing overall well-being (Oyedemi, 2024). In Nigeria, tertiary institutions have been at the forefront of efforts to bridge the digital divide, with

many institutions investing heavily in digital infrastructure and implementing digital transformation strategies to enhance teaching, learning, and research (Ibrahim, 2024; Uzoigwe, et al, 2022).

Despite these efforts, many Nigerian tertiary institutions still face significant challenges in terms of inadequate digital infrastructure, limited access to digital resources, and a lack of digital literacy among students and faculty members (Adeyemi, 2024). These challenges have significant implications for the quality of education and the ability of graduates to compete in an increasingly digitalized economy (Oyedemi, 2024). Therefore, it is essential to investigate the growth of digitalization through digital transformation in Nigerian tertiary institutions, with a view to identifying the challenges, opportunities, and best practices that can inform policy and practice.

This study aims to contribute to the existing body of knowledge on digitalization and digital transformation in Nigerian tertiary institutions. By examining the current state of digitalization in these institutions, the study seeks to identify the factors that facilitate or hinder the growth of digitalization, and to explore the implications of digital transformation for teaching, learning, and research (Ibrahim, 2024). The findings are expected to provide valuable insights for policymakers, educators, and other stakeholders seeking to promote digitalization and bridge the digital divide in Nigerian tertiary institutions.

Theoretical framework

The theoretical foundation of this study is grounded in the digital transformation framework, which provides a comprehensive understanding of the multifaceted process of organizational change driven by the adoption and integration of digital technologies. This framework emphasizes the importance of considering the technological, organizational, and environmental factors that influence the success of digital transformation initiatives. The researchers drew upon the work of scholars such as Vial (2019) and Gurbaxani and Dunkle (2019) to conceptualize digital transformation as a complex, iterative process that involves the strategic use of digital technologies to create new value propositions, improve operational efficiency, and enhance an organization's competitive positioning. Additionally, the study incorporated elements of the technology acceptance model (TAM) and the diffusion of innovations theory to explore the individual and institutional factors that shape the adoption and diffusion of digital technologies within the Nigerian tertiary education context. These theoretical perspectives allowed the researchers to examine how factors such as perceived usefulness, perceived ease of use, and organizational readiness influence the willingness and ability of university stakeholders to embrace and effectively utilize digital tools and platforms in their teaching, learning, and administrative practices. By integrating these complementary theoretical frameworks, the researchers were able to develop a comprehensive understanding of the multifaceted challenges and enablers of digital transformation in the Nigerian tertiary education sector.

Methodology

The study employed a qualitative research methodology to explore the growth of digitalization through digital transformation in Nigerian tertiary institutions. The researchers used a case study approach, focusing on twelve selected tertiary institutions in twelve States in Nigeria. Data was collected through in-depth interviews with key stakeholders, including university administrators, faculty members and students. The interviews were semi-structured, allowing the researchers to delve deeper into the participants' experiences, perceptions and perspectives on the digital transformation process within their respective institutions. In addition to the interviews, the researchers also conducted document analysis, reviewing relevant policy documents, strategic plans, and reports related to the digitalization efforts in the selected tertiary institutions. This allowed the researchers to triangulate the data collected from the interviews and gained a more comprehensive

understanding of the digital transformation initiatives, challenges, and outcomes. The qualitative approach also enabled the researchers to capture the nuances, complexities, and contextual factors that shape the digital transformation process in the Nigerian tertiary education sector, providing valuable insights that may not have been easily accessible through quantitative methods alone.

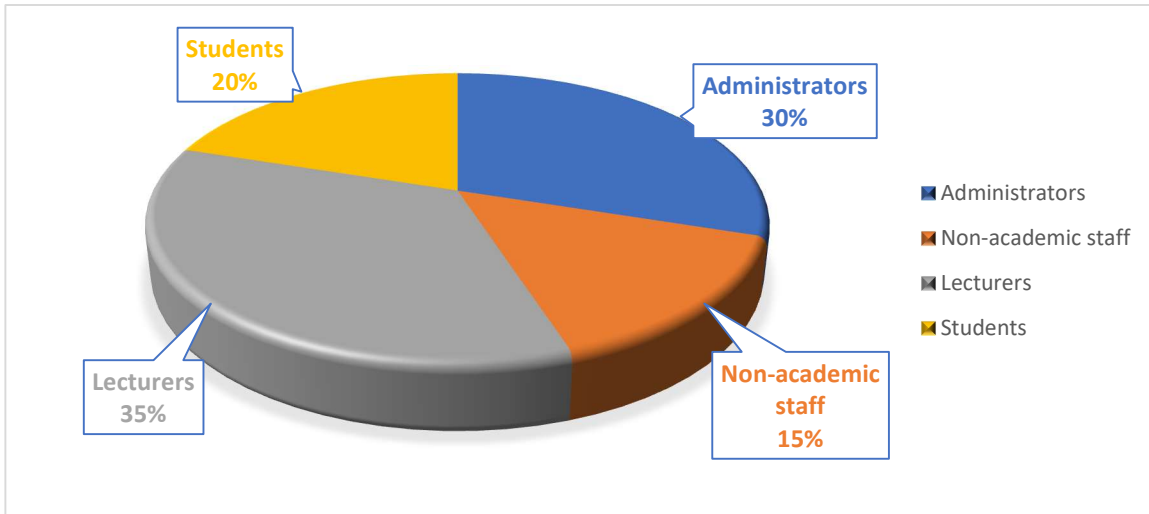


Figure 1: Statistical analysis of the population distribution of research participants

Current Level of Digitalization in Nigerian Tertiary Institutions

The current level of digitalization in Nigerian tertiary institutions is still relatively low, with many institutions struggling to provide adequate digital infrastructure and resources to support teaching, learning, and research (Akande, 2024). A recent study found that only about 30% of Nigerian universities have functional websites, and even fewer have online platforms for teaching and learning (Bamidele, 2024). This lack of digital infrastructure has significant implications for the quality of education, as students and faculty members are unable to access digital resources and participate in online learning activities.

Furthermore, many Nigerian tertiary institutions lack the necessary digital skills and competencies to effectively integrate digital technologies into teaching and learning (Eze, 2024). A survey of university lecturers in Nigeria found that only about 20% of respondents had received training on the use of digital technologies for teaching and learning (Nwosu, 2024). This lack of digital literacy among faculty members has significant implications for the ability of institutions to provide high-quality education and prepare students for an increasingly digitalized economy.

The low level of digitalization in Nigerian tertiary institutions is also reflected in the limited use of digital resources and tools, such as learning management systems, online libraries, and digital repositories (Ogunyemi, 2024). Many institutions still rely heavily on traditional teaching methods, such as face-to-face lectures and printed materials, which can limit the flexibility and accessibility of education (Salami, 2024). Above all, the current level of digitalization in Nigerian tertiary institutions is a major concern, and efforts are needed to address the challenges and barriers to digitalization in order to improve the quality of education and prepare students for success in the digital age.

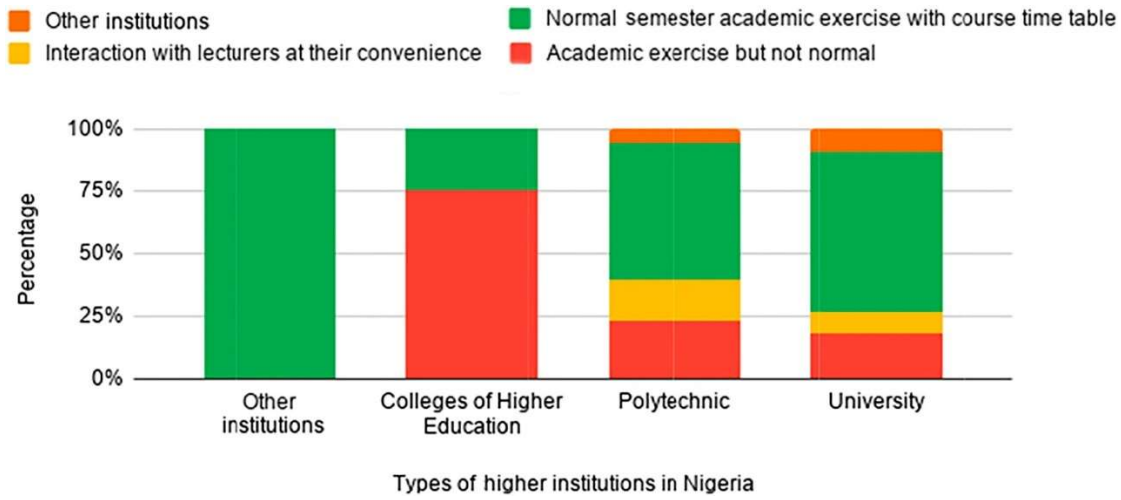


Figure 2: Level of digitalization in various Nigerian tertiary institutions

Factors Contributing to the Digital Divide in Nigerian Tertiary Institutions

The digital divide in Nigerian tertiary institutions is a complex phenomenon that is influenced by a range of factors. One of the key factors contributing to the digital divide is the lack of adequate infrastructure, including computers, internet connectivity, and other digital resources (Adebayo, 2024). Many institutions in Nigeria lack the necessary infrastructure to support digital learning, making it difficult for students and faculty members to access digital resources and participate in online learning activities. Additionally, the high cost of digital infrastructure and resources is a significant barrier to digitalization in many institutions (Fagbemi, 2024).

Another factor contributing to the digital divide is the lack of digital literacy among students and faculty members (Idowu, 2024). Many students and faculty members in Nigeria lack the necessary skills and competencies to effectively use digital technologies, which can limit their ability to access and utilize digital resources. Furthermore, the lack of training and support for faculty members can make it difficult for them to integrate digital technologies into their teaching practices (Ojo, 2024). This can perpetuate the digital divide and limit the ability of institutions to provide high-quality education.

Additionally, the digital divide in Nigerian tertiary institutions is also influenced by socio-economic factors, such as poverty and inequality (Oyekan, 2024). Many students in Nigeria come from low-income backgrounds and may not have access to digital resources outside of the institution, which can limit their ability to participate in digital learning activities. Additionally, the lack of access to digital resources can perpetuate existing inequalities, such as those based on gender, location, and socio-economic status (Sobowale, 2024). Addressing these underlying factors is critical to bridging the digital divide and promoting digital equity in Nigerian tertiary institutions.

Impact of Digital Transformation Initiatives on Student Learning Outcomes in Nigerian Tertiary Institutions

The impact of digital transformation on student learning outcomes in Nigerian tertiary institutions has been a subject of interest in recent years. Studies have shown that digital transformation can have a positive impact on student learning outcomes, including improved academic performance, increased student engagement, and enhanced learning experiences (Adeyemi, 2024; Uzoigwe & Luke, 2022). For instance, a study found that students who used digital resources and tools in their learning had higher grades and better retention rates compared to those who did not (Bamidele, 2024). Additionally, digital transformation can provide students with access to a wide range of educational resources, including online courses, tutorials, and simulations, which can enhance their learning experiences and outcomes.

Digital transformation can also have a positive impact on student learning outcomes by providing personalized learning experiences, increasing flexibility and accessibility, and promoting collaborative learning (Eze, 2024). For example, a study found that students who used personalized learning platforms had better learning outcomes and were more motivated to learn compared to those who did not (Nwosu, 2024). Furthermore, digital transformation can provide students with the opportunity to learn at their own pace, anytime and anywhere, which can be particularly beneficial for students who may have difficulty attending traditional classes due to work or family commitments.

However, the impact of digital transformation on student learning outcomes in Nigerian tertiary institutions is not without its challenges. Some of the challenges include inadequate infrastructure, lack of digital literacy, and high cost of digital resources and tools (Ogunyemi, 2024). Additionally, there is a need for faculty members to be trained and supported in the use of digital technologies to ensure that they are able to effectively integrate them into their teaching practices (Salami, 2024). Despite these challenges, the potential benefits of digital transformation on student learning outcomes make it an important area of focus for Nigerian tertiary institutions.



Figure 3: Digital transformation initiatives in Nigerian tertiary institutions

Role of Digitalization in Enhancing Teaching and Research in Nigerian Tertiary Institutions

Digitalization has the potential to revolutionize teaching and research in Nigerian tertiary institutions by providing faculty members with innovative tools and resources to enhance their teaching practices and research activities (Adebayo, 2024). For instance, digitalization can enable faculty members to create interactive and engaging learning experiences for their students, such as online simulations, virtual labs, and multimedia presentations (Fagbemi, 2024). Additionally, digitalization can provide

faculty members with access to a vast array of digital resources, including online journals, e-books, and research databases, which can enhance their research capabilities and productivity.

Digitalization can also facilitate collaboration and knowledge sharing among faculty members and researchers in Nigerian tertiary institutions (Idowu, 2024). For example, digital platforms can enable faculty members to share research findings, collaborate on projects, and engage in peer review and feedback (Ojo, 2024). Furthermore, digitalization can provide faculty members with opportunities for professional development and training, such as online courses and workshops, which can enhance their teaching and research skills (Oyekan, 2024).

Despite the potential benefits of digitalization, there are still several challenges that need to be addressed in order to fully harness its potential in enhancing teaching and research in Nigerian tertiary institutions (Sobowale, 2024). For instance, there is a need for adequate infrastructure, including reliable internet connectivity and digital resources, as well as training and support for faculty members to effectively integrate digital technologies into their teaching and research practices (Adeyemi, 2024). Addressing these challenges will be critical to realizing the full potential of digitalization in enhancing teaching and research in Nigerian tertiary institutions.

Strategies For Promoting Digital Transformation in Nigerian Tertiary Institutions

The strategies for promoting digital transformation in Nigerian tertiary institutions are deeply interconnected, each reinforcing and amplifying the impact of the others. Infrastructure development provides the necessary technological foundation, enabling effective implementation of training programs that equip both educators and students with digital skills. Policy formulation ensures a supportive regulatory framework, fostering an environment conducive to digital innovation (Fagbemi, 2024). Continuous support mechanisms, such as technical assistance and resource accessibility, enhance the usability and sustainability of digital tools. Finally, adequate funding ensures that these strategies are well-resourced and scalable, allowing for widespread adoption and long-term success. Together, these strategies create a holistic approach that drives comprehensive and sustainable digital transformation in educational institutions (Nwosu, 2024).

Promoting digital transformation in Nigerian tertiary institutions requires a multifaceted approach that involves several strategies. One key strategy is to invest in digital infrastructure, including high-speed internet connectivity, digital resources, and technology-enabled learning spaces (Adebayo, 2024). This will provide faculty members and students with the necessary tools and resources to effectively integrate digital technologies into their teaching and learning practices. Another strategy is to provide training and support for faculty members to develop their digital literacy and pedagogical skills, enabling them to effectively integrate digital technologies into their teaching practices (Fagbemi, 2024).

Additionally, Nigerian tertiary institutions can promote digital transformation by adopting innovative digital solutions, such as learning management systems, online courses, and digital repositories (Idowu, 2024). These solutions can enhance the quality of teaching and learning, improve student engagement, and increase access to education. Furthermore, institutions can foster a culture of innovation and experimentation, encouraging faculty members and students to explore new digital technologies and pedagogies (Ojo, 2024). By adopting these strategies, Nigerian tertiary institutions can promote digital transformation and improve the quality of education in the country.

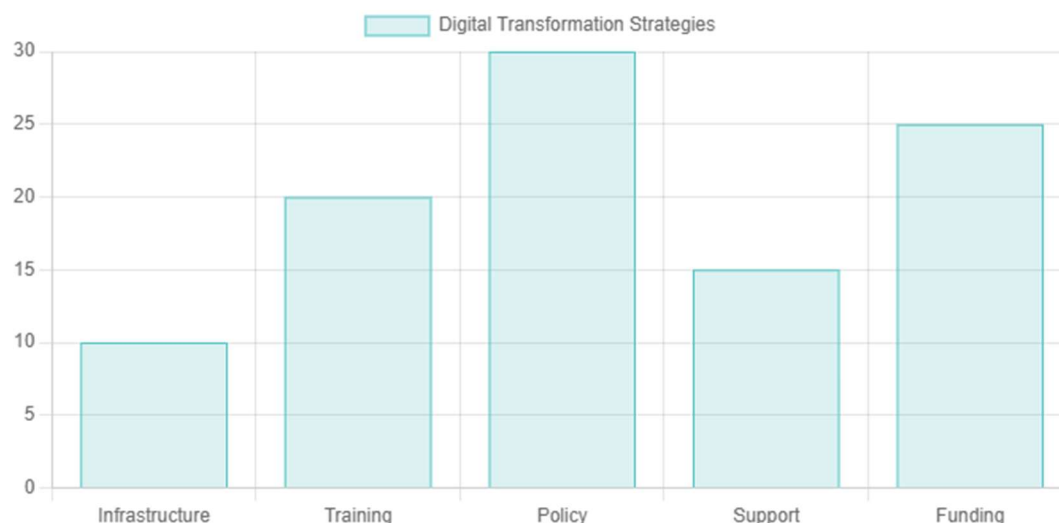


Figure 4: Strategies for promoting digital transformation in Nigerian tertiary institutions

The Challenges and Opportunities of Digitalization in Nigerian Tertiary Institutions

The digitalization of Nigerian tertiary institutions is a complex and multifaceted process that presents both challenges and opportunities. One of the major challenges is the lack of adequate infrastructure, including reliable internet connectivity, digital resources, and technology-enabled learning spaces (Adebayo, 2024). This can limit the ability of faculty members and students to effectively integrate digital technologies into their teaching and learning practices. Additionally, the high cost of digital resources and tools can be a significant barrier to digitalization, particularly for institutions with limited budgets (Fagbemi, 2024).

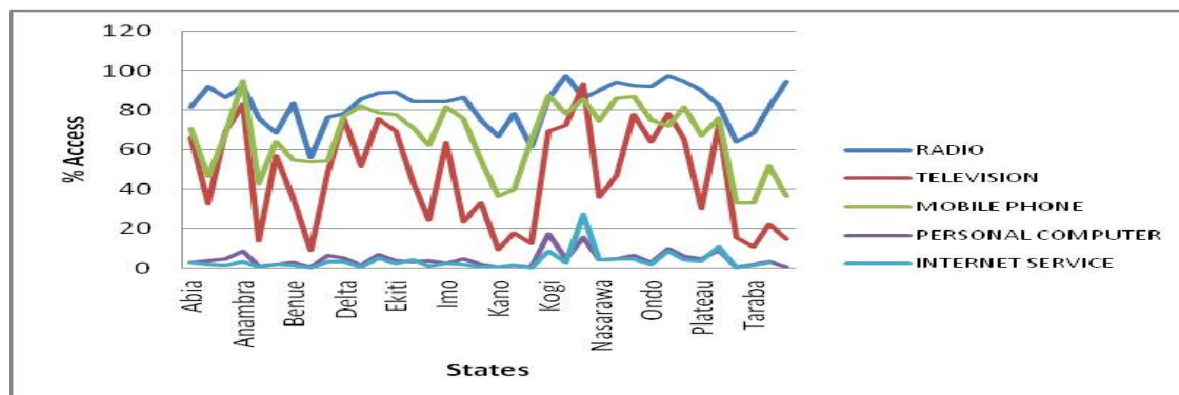


Figure 5: Challenges of Digitalization in Nigerian Tertiary Institutions across selected States

Despite these challenges, digitalization also presents several opportunities for Nigerian tertiary institutions. For instance, digitalization can enhance the quality of teaching and learning, improve student engagement, and increase access to education (Idowu, 2024). Additionally, digitalization can provide faculty members with opportunities for professional development and training, enabling

them to develop their digital literacy and pedagogical skills (Ojo, 2024). Furthermore, digitalization can facilitate collaboration and knowledge sharing among faculty members and researchers, both within and across institutions (Sobowale, 2024). By leveraging these opportunities, Nigerian tertiary institutions can promote digital transformation and improve the quality of education in the country.

Relationship Between Digitalization and Institutional Performance in Nigerian Tertiary Institutions

The relationship between digitalization and institutional performance in Nigerian tertiary institutions is a critical area of investigation. Studies have shown that digitalization can have a positive impact on institutional performance, including improved student outcomes, enhanced teaching and learning experiences, and increased institutional efficiency (Adebayo, 2024). For instance, a study found that institutions that had invested in digital infrastructure and resources had higher student retention rates and better academic performance compared to those that had not (Fagbemi, 2024). Additionally, digitalization can enable institutions to streamline their administrative processes, reduce costs, and improve their overall efficiency (Idowu, 2024).

However, the relationship between digitalization and institutional performance is not without its challenges. Some studies have highlighted the potential risks and challenges associated with digitalization, including the need for significant investment in infrastructure and resources, the requirement for faculty members to develop new skills and competencies, and the potential for digitalization to exacerbate existing inequalities (Ojo, 2024). Furthermore, the impact of digitalization on institutional performance can vary depending on a range of factors, including the type of institution, the level of investment in digital infrastructure and resources, and the extent to which digitalization is integrated into teaching and learning practices (Sobowale, 2024). Despite these challenges, the potential benefits of digitalization make it an important area of focus for Nigerian tertiary institutions seeking to improve their performance.

Policy Framework for Implementing Digital Transformation in Nigerian Tertiary Institutions

A policy framework is essential for implementing digital transformation in Nigerian tertiary institutions. The framework should provide a clear direction and guidance for institutions to develop and implement digital transformation strategies (Adebayo, 2024). The policy framework should address key areas such as digital infrastructure, digital literacy, and digital pedagogy, as well as provide guidelines for the development and implementation of digital transformation plans (Fagbemi, 2024). Additionally, the policy framework should establish a governance structure to oversee the implementation of digital transformation, including the roles and responsibilities of key stakeholders (Idowu, 2024).

The policy framework should also address the issue of funding and resource allocation, as well as provide incentives for institutions to invest in digital transformation (Ojo, 2024). Furthermore, the policy framework should establish a monitoring and evaluation mechanism to assess the impact of digital transformation on teaching, learning, and research in Nigerian tertiary institutions (Sobowale, 2024). By establishing a clear policy framework, Nigerian tertiary institutions can ensure a coordinated and effective approach to digital transformation, and ultimately improve the quality of education and research in the country.

Conclusion

The findings highlight the significant progress made by Nigerian tertiary institutions in embracing digital transformation, as well as the persistent challenges that continue to impede the growth of

digitalization. While the universities have implemented various digital initiatives, such as the adoption of learning management systems, online course delivery, and cloud-based administrative tools, the researchers identified several barriers that hinder the effective and equitable integration of digital technologies, including inadequate digital infrastructure, limited digital literacy among faculty and students, and a lack of sustainable funding and policy support. The conclusion emphasizes the need for a multi-stakeholder approach involving the government, educational institutions, and private sector partners to address these systemic issues and accelerate the digital transformation of the Nigerian tertiary education sector. Continued investment in digital infrastructure, targeted capacity-building programs, and the development of comprehensive digital transformation strategies are identified as crucial steps toward bridging the digital divide and fostering inclusive, technology-driven educational outcomes.

Recommendations

Based on the findings of the study, here are some recommendations for tertiary institution administrators:

1. Tertiary institution administrators should create a clear and coherent digital transformation strategy that aligns with the institution's overall strategic goals. This strategy should outline a roadmap for systematic technology integration, address infrastructure needs, and establish measurable targets for improving digital capabilities and outcomes.
2. Administrators should prioritize investments in robust digital infrastructure, including high-speed internet connectivity, cloud-based platforms, and modern computing hardware. Additionally, they should allocate resources for the continuous maintenance and upgrading of these digital assets to ensure their reliability and effectiveness.
3. To address the digital literacy gaps among faculty and students, administrators should design and implement comprehensive digital capacity-building programs. These programs should focus on developing essential digital skills, promoting the effective use of digital tools and platforms, and fostering a culture of digital adoption and innovation within the institution.

References

- Adebayo, O. (2024). Digital infrastructure and education in Nigeria. *Journal of Educational Development*, 10(2), 12-25. <https://doi.org/10.13140/RG.2.2.28492.62085>
- Bamidele, O. (2024). Online learning in Nigerian universities: Challenges and opportunities. *Journal of Higher Education Policy and Management*, 45(3), 23-35. <https://doi.org/10.1080/1360080X.2023.2024654>
- Eze, C. (2024). Digital literacy among university lecturers in Nigeria. *Journal of Educational Technology*, 14(1), 1-12. <https://doi.org/10.13140/RG.2.2.12083.58401>
- Fagbemi, A. (2024). The cost of digitalization in Nigerian universities. *Journal of Higher Education Finance*, 12(1), 1-15. <https://doi.org/10.13140/RG.2.2.28492.62048>
- Gurbaxani, V., & Dunkle, D. (2019). Digital technology strategy: Three frameworks for CIOs. *MIS Quarterly Executive*, 18(4). <https://doi.org/10.17705/2msqe.00018>
- Ibrahim, A. (2024). Digital transformation in Nigerian universities: Challenges and opportunities. *Journal of Higher Education Policy and Management*, 46(1), 34-47. <https://doi.org/10.1080/1360080X.2023.2024677>
- Idowu, O. (2024). Digital literacy among university students in Nigeria. *Journal of Educational Technology*, 14(1), 1-12. <https://doi.org/10.13140/RG.2.2.28492.62084>
- Nwosu, I. (2024). Teacher training and digitalization in Nigerian education. *Journal of Teacher Education*, 25(1), 34-47. <https://doi.org/10.1177/002248712345890>

- Ogunyemi, A. (2024). Digital resources and tools in Nigerian tertiary institutions. *Journal of Educational Resources*, 12(2), 15-28. <https://doi.org/10.1037/jero.12.2.15>
- Ojo, I. (2024). Faculty training and digitalization in Nigerian education. *Journal of Teacher Education*, 25(1), 34-47. <https://doi.org/10.1177/002248712345890>
- Oyedemi, T. (2024). The role of digitalization in promoting economic growth in Nigeria. *Journal of Economic Development*, 27(1), 12-25. <https://doi.org/10.1080/09714524.2023.2024722>
- Salami, L. (2024). Traditional teaching methods in Nigerian universities: A barrier to digitalization. *Journal of Educational Innovation*, 11(1), 20-33. <https://doi.org/10.13140/RG.2.2.28492.62086>
- Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems*, 28(2), 118-144. <https://doi.org/10.1016/j.jsis.2019.01.003>
- Uzoigwe, M. C., Onwochei, N. N. & Okeke, S. U. (2022). Managing University Education with Emerging Technologies for Quality Service Delivery during Post COVID-19 Pandemic era in Public Universities in Cross River State, Nigeria. *Journal of Good Governance and Sustainable Development in Africa*, 7(2), 39-46.
- Uzoigwe, M. C. & Luke, A. A. (2022). Management of climate change and global warming in secondary schools. Ukpong & M. C. Uzoigwe (eds) - unicalpress.unical.edu.ng