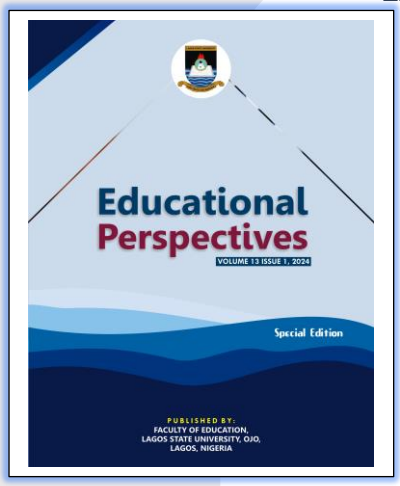

Navigating Technological Integration: Digital Transformation and the Challenges of Educators in Nigeria

Onasanya Hafsat Ibironke & Fadeyibi Bolaji Jayeola

Department of Educational Management, Faculty of Education, Lagos State University,Ojo
Department of Educational Management, Faculty of Education, Lagos State University,Ojo

KEYWORDS:

Technology, integration, education, pedagogy, digital transformation

WORD COUNT:
207

CORRESPONDING EMAIL ADDRESS:
hafsat.onasanya@lasu.edu.ng

ORCID NUMBER:

0000-0002-4576-2645

ABSTRACT

The rapid advancement of digital technologies has revolutionized various sectors, including education. As educational institutions increasingly adopt digital tools and platforms, the imperative to prepare educators for this digital transformation has become more pronounced. This study explored technological integration in education and the challenges teachers face when adopting new technologies for pedagogical purposes. Data for the study was gathered from secondary sources. The findings reveal that the pace of technological change is one primary challenge teachers face. With new tools and platforms emerging continuously, educators often struggle to stay abreast of the latest innovations. Additionally, the disparity in technological infrastructure across different regions exacerbates this issue, with teachers in low-resource settings facing significant hurdles in accessing the necessary tools and training. Furthermore, effective integration demands a high level of digital literacy among educators. Resistance to change, stemming from a lack of confidence or familiarity with technology, further complicates the problem. To address these challenges, comprehensive and continuous professional development programs are essential. Effective strategies include personalized training, workshops, online courses, and peer collaboration that provide hands-on experience and foster a supportive learning community. Similarly, mentorship programs, the provision of digital tools and facilities, and policy support are crucial for creating a conducive environment for educators' professional development.

HOW TO CITE

Onasanya H.I & Fadeyibi B.J. (2025). Navigating Technological Integration: Digital Transformation and the Challenges of Educators in Nigeria. *Educational Perspectives, 13*(2), 117-126.

Introduction

The rapid advancement of technology has transformed virtually every sector, including education, causing a paradigm shift and digital transformation in education (Palacios-Rodríguez et al., 2023). Digital transformation in education involves integrating digital technologies into all aspects of the educational process, fundamentally altering how educators teach and students learn. As Panakaje et al., (2024) note, students have become very familiar with and show a strong preference for technologies. Young people pursuing higher education have also become particularly adept at using the internet and other digital devices as a medium of social interaction. Hence, to effectively educate these tech-savvy generations, it is essential for teachers to learn and incorporate digital media into their teaching practices.

The use of digital technology in education has become pervasive across the world (Vásquez-Peñafiel et al., 2023). It stands as one of the most influential forces transforming the educational landscape today. Numerous schools currently demonstrate robust support for integrating higher levels of technology in the classroom by providing essential hardware such as computers, and internet connectivity, and implementing comprehensive programs aimed at improving computer literacy for both teachers and students (Herold, 2020). While this transformation offers numerous benefits, such as increased accessibility to information, personalized learning experiences, and enhanced engagement, it also presents significant challenges for educators.

Educators generally recognize and appreciate the advantages offered by educational technologies. Yet, they frequently encounter considerable challenges in seamlessly and effectively integrating these tools into their teaching practices (Johnson et al., 2016). This is primarily because the process of technology integration is multifaceted, involving the acquisition of new technological equipment, adaptation of curricula, and modification of teaching techniques to incorporate these new educational tools, each step presenting its own set of difficulties, from ensuring equitable access to devices and internet for all students to providing adequate training and ongoing support for teachers (Panakaje et al. 2024; Johnson et al. 2016).

Johnson et al. (2016) similarly acknowledged these challenges, indicating that many teachers feel unprepared to fully utilize new technologies due to insufficient training and support. Additionally, adapting curricula to integrate technology in meaningful ways often requires significant time and effort, further complicating the integration process (Trust & Whalen, 2020). Despite these obstacles, the push towards greater technological integration in education continues to grow, driven by the potential for enhanced learning outcomes and the need to prepare students for a digitally-driven future. Similarly, as education systems rapidly integrate digital technologies, new solutions and tools are introduced and integrated into day-to-day learning and education logistics (Amoah, 2024; Walimbwa, 2023). Hence, the need to develop and integrate the digital skills of individual educators and learners becomes a matter of great attention (Ndulu et al., 2023; Shao et al., 2023; Abate et al., 2023; Owoseni, 2023; Mhlongo et al., 2023; Arewa, 2021).

The Concept of Digital Transformation

Digital transformation refers to the process of integrating digital technologies into all aspects of an organization's operations, fundamentally changing how it functions and delivers value to its stakeholders. This transformation goes beyond merely adopting new technologies; it involves rethinking and redesigning workflows, culture, and customer interactions to leverage the full potential of digital advancements. According to Hinings et al. (2018), digital Transformation (DT or DX) is "the combined effects of several digital innovations

bringing about novel actors (and actor constellations), structures, practices, values, and beliefs that change, threaten, replace or complement existing rules of the game within organizations, ecosystems, industries or fields" (p. 53). Hence, as Gobble (2018) puts it, DT is an "extended process of change that may have multiple goals, while innovation is focused on the moment of invention and the implementation of that invention" (p. 57).

Digital transformation (DT) in education focuses on creating a more interconnected and dynamic ecosystem where technology enhances every aspect of the learning experience by bringing together people, processes and data to enhance the learning environment for students, educators, parents, and other stakeholders in a world currently overtaken by technology (McCarthy et al., 2023). This holistic approach aims to not only optimize current educational practices but also to anticipate and prepare for future innovations and challenges. Hence, a reorganization of formal and informal learning environments as well as the educational content and delivery may become necessary.

Technological Integration in Education, why is it important?

Technological integration is a practical application of technology into the art of teaching, teaching models, teaching concepts, teaching patterns, and application environments by using modern technology. A powerful tool, the integration of technology in the educational sector equips educators and learners with the capacities to access repositories to various sources of information for quick study and instructional purposes. Educational technologies are tools for learning, and they supply the needed experience on the utilization of educational tools. Many research studies have mentioned the relevance of technology in education. As a powerful tool, technology is widely utilized in educational systems all over the world. Developed countries, in particular, have been committed to enhancing the quality and standard of their educational systems through specialized research to improve a learning environment, including instructional design on technology implementation for educational improvement (Szymkowiak et al.2021; Chen et al., 2020; Bond et al., 2020; Haleem et al., 2022; Akkerman et al., 2021).

The integration of technology into education holds several benefits. For instance, Bowers (2016) highlights the relevance of digital tools such as interactive whiteboards, educational software, and online learning platforms for increasing learners' engagement and improving learning outcomes. Bowers (2016) also affirms that digital tools can captivate students' attention and make complex concepts easier to understand. Similarly, the integration of digital technologies into education enhances personalization and student-centeredness (Johnson et al., 2021), helping educators to provide tailored content and assessments that enable students to progress at their own pace.

Furthermore, technological integration through assistive technologies and online resources provides opportunities for inclusive education by allowing students with disabilities as well as those in remote locations to participate in education (Smith & Basham, 2014). technological integration also enhances communication, collaboration and administrative efficiency among students, teachers, and parents. Tools such as learning management systems (LMS), video conferencing, and collaborative documents enable seamless interaction and teamwork (Trust & Whalen, 2020). Similarly, technology streamlines administrative tasks such as grading, attendance tracking, and resource management allowing educators to focus more on teaching and less on paperwork (Herold, 2020).

Challenges Faced by Educators in Nigeria

Despite its numerous benefits, the integration of technology in education presents several

significant challenges. In Nigeria, the challenges of technological integration are numerous considering that the country's status as a developing country. In their study on the integration strategies of media technologies in the teaching of primary schools in the rural areas of Akwa Ibom State, Willie and Akirika (2023) found that while digital technologies greatly enhance learning among primary school students effectively integrating into the educational system is often problematic. The authors identified the challenges of technological integration among educators in Nigeria to include insufficient resources, inadequate access to technology, lack of administrative support by government and schools, negative perception of the use of technology and its impact on culture, lack of knowledge and expertise on the part of teachers, focus on using technology for computer-based testing rather than teaching and learning as well as negative attitude of teachers to technology.

Similarly, Olokooba, Okunloye, Abdulsalam, and Balogun (2018) reported similar challenges preventing the effective integration of technology into educational processes in Nigeria. These include challenges such as the unavailability of computers, the lack of instructional software, the inadequacy of teachers' technical knowledge, the irregular power supply, and the deficient maintenance of computer systems as the main barriers to the use of ICT in Nigerian schools. Obielodan et al., (2020) also identified that ICT tools are mostly unavailable for teaching in many schools and the few available ones are not frequently used. Many teachers in most schools were also found to have little or no pedagogical knowledge of how to effectively adopt ICT tools for pedagogical purposes.

Anene et al. (2014) conducted a study at the University of Abuja, Nigeria, focusing on the challenges and opportunities of e-learning in Nigerian universities. They examined the availability of e-learning facilities and materials and sought to determine if students utilized e-learning in their studies. Their findings revealed that infrastructure deficiencies were a major obstacle to the use of ICT. Structural institution-wide deficiencies with the technological integration, especially the dearth of adequate e-learning library domains, online seminars or discussions with lecturers, online examinations, and limited bandwidth also contribute to poor technological integration. Chiaha et al. (2013) also found problems of irregular electric power supply, poor network connection, among others.

Considering that previous studies have consistently pointed to the lack of technological facilities as the problem of technological integration in Nigeria, Atsumbe et al. (2012) conducted their study to examine the availability and utilization of e-learning infrastructures in a Nigerian University. Their study revealed that although technological facilities were available, they were mostly used for administrative purposes. As such they found that technological facilities specifically directed toward teaching and learning were inadequate and while teachers and students have access to computers and internet facilities they are barely used for teaching and learning.

Further studies (Oye et al., 2011; Eze et al., 2018) have also found challenges that move beyond the unavailability of technological facilities to include the comfort of teachers with traditional pedagogical methods and the unwillingness to learn or integrate emerging technologies into their teaching. For instance, Eze et al. (2018) found that many educators are accustomed to traditional, teacher-centred approaches and may be resistant to adopting new, technology-enhanced pedagogies. This resistance is often rooted in a preference for familiar methods and a reluctance to step out of their comfort zones (Eze et al., 2018).

Similarly, Ajayi (2008) found that some educators may experience technophobia, or a fear of using technology which may be further exacerbated by a lack of confidence in their ability to effectively use

digital tools, leading to avoidance and resistance (Ajayi, 2008). Educators may also be sceptical about the actual benefits of using technology in education. According to Onyema (2020), some educators doubt that digital tools can improve student learning outcomes, viewing them as distractions rather than enhancements.

Other studies acknowledge the dearth of IT skill development training for educators as one of the major challenges to technological integration in Nigeria. Martens et al. (2020) found that aside from the lack of assess to technological facilities and the internet, teachers lack access to training and professional development that empower them to effectively integrate technology into their classes. Onyema (2020) similarly emphasized the importance of training, indicating that while many schools try to promote the use of technology, they neglect the importance of training and capacity development for educators. As crucial as technological devices and their potential advantages may be for education and learning, the capacity to use these devices is more important. Nonetheless, the teachers in many Nigerian schools do not receive regular training on basic computer skills.

Ayoku and Okafor (2015) found that university librarians in Nigeria have good skills in e-mail use and word-processing tasks, but they do not understand how to evaluate and catalogue e-resources; have no knowledge of subject gateways, specialized databases and some open-access library databases; have no knowledge of database management; are not skilled in web design and are equally not familiar with web design applications. Hence, the need for skill development and capacity building is sacrosanct. Similarly, Seena and Sudhier-Pillai (2014) found that aside from the lack of infrastructure and network facilities, a significant number of library professionals lack of training. Bolaji et al. (2022) also found training and the lack of resources such as funds, physical facilities, internet connectivity, and e-database subscriptions among others, as some of the challenges of technological integration. There is also a dying computer culture in many schools because most computer systems have not been used for years due to the issue of getting professionals who can use and manage these systems. It is not because the teachers are not interested in learning, but many of them do not even have basic knowledge of technology or have not received any applicable training. Some teachers are flexible with internet use and other computer skills but still require specific skills in the area of multimedia design (Demissie et al., 2022).

Policy Frameworks and Initiatives for Digital Transformation in Nigerian Education

The education sector in Nigeria has experienced several institutional and policy reforms driven by the government at various levels (federal, state, and local). Several of these policies and initiatives have been focused on the use of information technology in education. Some of these include the National Policy on Information and Communication Technology (ICT) in Education introduced by the Federal Government of Nigeria to integrate ICT into the educational system at all levels (Federal Ministry of Education, 2019). The policy outlines objectives such as developing ICT infrastructure, enhancing digital literacy among students and teachers, and incorporating ICT into the curriculum. The National Broadband Plan (NBP) was also instituted to expand broadband access across Nigeria, including rural and underserved areas. By improving internet connectivity, the plan supports the implementation of e-learning and other digital educational initiatives. The NBP sets targets for broadband penetration, aiming to provide robust and affordable internet access to educational institutions (Nigerian Communications Commission, 2020). Furthermore, the Universal Service Provision Fund (USPF) was designed to promote universal access to ICT services in Nigeria. The fund supports projects that provide ICT infrastructure and services to educational

institutions, particularly in rural areas. This initiative aims to bridge the digital divide and ensure equitable access to technology (USPF, 2018). Despite these initiatives, digital transformation in Nigerian still suffers setbacks

The Role of Leadership in Driving Technological Integration

Educational leaders are crucial for driving digital transformation in education. Although physical devices are crucial, the role of leaders in creating an environment conducive to technology adoption, fostering innovation, and ensuring that both educators and students can maximize the benefits of digital tools is pivotal for digital transformation. One of the primary roles of educational leaders in driving technological integration is the creation of a clear and compelling vision. This vision should articulate how technology can enhance teaching and learning, improve administrative efficiency, and prepare students for future challenges (Hew & Brush, 2007). To be effective, all stakeholders must be involved in the vision development to ensure widespread support and commitment. Leaders also have the responsibility of developing a strategic plan that outlines the steps needed to achieve technological integration, including timelines, resource allocation, and evaluation metrics (Anderson & Dexter, 2005). This also includes ensuring that technology initiatives are aligned with the broader educational objectives and that progress can be monitored and assessed (Picciano, 2011).

Leadership is crucial in securing and managing the resources necessary for technological integration. This includes financial resources, infrastructure, and human capital. Leaders advocate for funding to support technology initiatives through various means including lobbying for budget allocations, seeking grants, or exploring partnerships (Afshari et al., 2009). Leaders also have the capacity to recruit, train, and retain skilled personnel who can support technology integration (Ertmer et al., 2012; Lawless & Pellegrino, 2007).

Leadership also helps to build a collaborative culture where all stakeholders work together towards the success of technological integration efforts. This can be achieved through stakeholder engagement (teachers, students, parents, and the community) through committees, focus groups, and surveys, ensuring that the voices of all stakeholders are heard and considered (Hargreaves & Fullan, 2012). Collaboration can also be achieved by proactively addressing by understanding the concerns of those who are hesitant about technology, providing adequate support, and demonstrating the benefits of technology integration through data and success stories (Hall & Hord, 2015).

Finally, leaders can achieve technological transformation through continuous monitoring and evaluation to assess the effectiveness of current efforts and make necessary adjustments. This is achievable through the establishment of clear metrics for evaluating the impact of technology on teaching and learning, conducting regular assessments to identify what is working well and where improvements are needed, and adapting strategies such as scaling up successful initiatives, discontinuing ineffective ones, and continuously seeking new and innovative ways to integrate technology (Means et al., 2010; Dexter, 2011; Fullan, 2013).

Conclusion and Recommendations

Digital transformation in Nigerian education holds immense potential to improve learning outcomes, increase accessibility, and prepare students for the future. While significant progress has been made through policy frameworks and initiatives, challenges such as infrastructure deficiencies, funding constraints, and inadequate training persist. Despite these challenges, technology has become an integral part of the educational landscape, and its integration into schools is inevitable. Therefore, educational stakeholders

must learn to maximize the opportunities offered by technology, and seek ways to address the identified challenges, since the benefits of technological integration far outweigh its challenges.

To overcome these challenges and advance digital transformation in Nigerian education, several actions are necessary. First, there is a need to strengthen educational infrastructure through investments in reliable electricity, internet services, and digital devices, especially in rural communities, to create a conducive environment for technology integration (Okebukola, 2007).

Furthermore, increasing budget allocations for education technology and seeking alternative funding sources, such as grants and partnerships, may help to provide the financial resources needed to support digital transformation initiatives (Ololube, 2006). Similarly, expanding and enforcing teacher training programs and professional development programs is crucial to enhancing digital literacy and competency, and help teachers stay updated with technological advancements (Ajayi, 2008).

Finally, the role of leadership in driving technological integration in education cannot be overstated. Effective leaders provide a clear vision, secure necessary resources, offer ongoing professional development, build collaborative cultures, and continuously monitor and evaluate progress. Hence, the commitment and actions of educational leaders are pivotal in transforming educational environments and achieving the full potential of technological integration.

References

Abate, G. T., Abay, K. A., Chamberlin, J., Kassim, Y., Spielman, D. J., & Tabe-Ojong, M. P. J. (2023). Digital tools and agricultural market transformation in Africa: Why are they not at scale yet, and what will it take to get there?. *Food Policy*, *116*, 102439.

Afshari, M., Bakar, K. A., Luan, W. S., Samah, B. A., & Fooi, F. S. (2009). Factors affecting teachers' use of information and communication technology. *International Journal of Instruction*, 2(1), 77-104.

Ajayi, I. A. (2008). Towards effective use of information and communication technology for teaching in Nigerian colleges of education. *Asian Journal of Information Technology*, 7(5), 210-214.

Akkerman, S. F., Bakker, A., & Penuel, W. R. (2021). Relevance of educational research: An ontological conceptualization. *Educational Researcher*, *50*(6), 416-424.

Amoah, L. G. A. (Ed.). (2024). *Examining the Rapid Advance of Digital Technology in Africa*. IGI Global.

Anene, J. N., Imam, H., & Odumuh, T. (2014). Problem and Prospect E-learning in Nigerian universities. *International Journal of Technology and Inclusive Education (IJTIE)*, *3*(2), 320–327.

Arewa, O. B. (2021). *Disrupting Africa: Technology, law, and development*. Cambridge University Press.

Atsumbe, B. N., Raymond, E, Enoch, E. B & Duhu, P. (2012). Availability and utilization of e-learning infrastructures in Federal University of Technology, Minna. *International Journal of Education and Practice, 3*(13), 56-64.

Ayoku, O. A. & Okafor, V. N. (2015). ICT skills acquisition and competencies of librarians: implications for digital and electronic environment in Nigerian universities libraries. *The Electronic Library*, *33*(3), 502-523.

Bolaji, H. O., & Adeoye, M. A. (2022). Accessibility, usability, and readiness towards ICT tools for monitoring educational practice in secondary schools. *Indonesian Journal of Multidiciplinary Research, 2*(2), 257-264.

Bond, M., Buntins, K., Bedenlier, S., Zawacki-Richter, O., & Kerres, M. (2020). Mapping research in student engagement and

educational technology in higher education: A systematic evidence map. *International journal of educational technology in higher education, 17*, 1-30.

Bower, M. (2016). Deriving a typology of web 2.0 learning technologies. *British Journal of Educational Technology*, 47(4), 763-777.

Chen, X., Xie, H., Zou, D., & Hwang, G. J. (2020). Application and theory gaps during the rise of artificial intelligence in education. *Computers and Education: Artificial Intelligence, 1*, 100002.

Chiaha, G. T. U, Eze, J. U., & Ezeudu, F. O. (2013). Education students' access to E-learning facilities in universities south-east of Nigeria. *Information and Knowledge Management*, *3*(10), 32–41.

Demissie, E. B., Labiso, T. O., & Thuo, M. W. (2022). Teachers' digital competencies and technology integration in education: Insights from secondary schools in Wolaita Zone, Ethiopia. *Social sciences & humanities open*, *6*(1), 100355.

Dexter, S. (2011). School technology leadership: Artifacts in systems of practice. *Journal of School Leadership*, 21(2), 166-189.

Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education*, 59(2), 423-435.

Eze, S. C., Chinedu-Eze, V. C., & Bello, A. O. (2018). The utilization of e-learning facilities in the educational delivery system of Nigeria: A study of M-University. *International Journal of Educational Technology in Higher Education*, 15(1), 1-20.

Federal Ministry of Education (2019). *National Policy on Information and Communication Technology (ICT) in Education*. May 2019. https://education.gov.ng/wp-content/uploads/2019/08/NATIONAL-POLICY-ON-ICT-IN-EDUCATION-2019.pdf

Fullan, M. (2013). *The New Meaning of Educational Change*. Teachers College Press.

Gobble, M.M. (2018). *Digitalization, digitization, and innovation*. *Research-Technology Management*, *61*(4), 56-59.

Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable operations and computers, 3*, 275-285.

Hall, G. E., & Hord, S. M. (2015). *Implementing Change: Patterns, Principles, and Potholes*. Pearson.

Hargreaves, A., & Fullan, M. (2012). *Professional Capital: Transforming Teaching in Every School*. Teachers College Press.

Herold, B. (2020). The impact of increased funding for educational technology in U.S. school districts. *Education Week*.

Hew, K. F., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technology Research and Development*, 55(3), 223-252.

Hinings, B., Gegenhuber, T., & Greenwood, R. (2018). Digital innovation and transformation: An institutional perspective. *Information and Organization*, *28*(1), 52-61.

Johnson, A. M., Jacovina, M. E., Russell, D. G., & Soto, C. M. (2016). Challenges and solutions when using technologies in the classroom. In *Adaptive educational technologies for literacy instruction* (pp. 13-30). Routledge.

Johnson, L., Becker, S. A., Cummins, M., Estrada, V., Freeman, A., & Hall, C. (2016). *NMC horizon report: 2016 higher education edition* (pp. 1-50). The New Media Consortium.

Johnson, L., Becker, S. A., Cummins, M., Estrada, V., Freeman, A., & Hall, C. (2021). *NMC Horizon Report: 2021 Higher Education Edition*. Austin, Texas: The New Media Consortium.

Lawless, K. A., & Pellegrino, J. W. (2007). Professional development in integrating technology into teaching and learning: Knowns, unknowns, and ways to pursue better questions and answers. *Review of Educational Research*, 77(4), 575-614.

Martens, M., Hajibayova, L., Campana, K., Rinnert, G. C., Caniglia, J., Bakori, I. G., ... & Oh, O. J. (2020). "Being on the wrong side of the digital divide": Seeking technological interventions for education in Northeast Nigeria. *Aslib Journal of Information Management*, *72*(6), 963-978.

McCarthy, P., Sammon, D., & Alhassan, I. (2022). Digital transformation leadership characteristics: A literature analysis. *Journal of Decision Systems*, *32*(1), 79-109.

Means, B., Padilla, C., & Gallagher, L. (2010). Use of education data at the local level: From accountability to instructional improvement. *US Department of Education, Office of Planning, Evaluation and Policy Development*.

Mhlongo, S., Mbatha, K., Ramatsetse, B., & Dlamini, R. (2023). Challenges, opportunities, and prospects of adopting and using smart digital technologies in learning environments: An iterative review. *Heliyon*, *9*(6).

Ndulu, B., Stuart, E., Dercon, S., & Knaack, P. (2023). *Driving Digital Transformation: Lessons from Seven Developing Countries* (p. 241). Oxford University Press.

Nigerian Communications Commission. (2020). *National Broadband Plan 2020-2025*.

Obielodan, O. O., Omojola, E. A., Kazeemtijani, O., & Samuel, N. (2020). Assessment of teachers' pedagogical knowledge on the utilization of information and communication technology in kwara state, nigeria. *International Journal of Education and Development using Information and Communication Technology*, *16*(1), 62-71

Okebukola, P. (2007). Innovations in teaching and learning: The case of a national university. *African Journal of Educational Studies in Mathematics and Sciences*, 5, 1-10.

Olokooba, I. N., Okunloye, R. W., Abdulsalam, A. A., & Balogun, I. N. (2018). Teachers' perceived challenges of using ICT in teaching secondary school social science subjects in Ilorin, Nigeria. *KIU Journal of Humanities*, *2*(2), 157-166.

Ololube, N. P. (2006). Appraising the relationship between ICT usage and integration and the standard of teacher education programs in a developing economy. *International Journal of Education and Development using ICT*, 2(3), 70-85.

Onyema, E. M. (2020). Integration of emerging technologies in teaching and learning process in Nigeria: the challenges. *Central Asian Journal of Mathematical Theory and Computer Sciences*, *1*(11), 35-39.

Owoseni, A. (2023). What is digital transformation? Investigating the metaphorical meaning of digital transformation and why it matters. *Digital Transformation and Society*, *2*(1), 78-96.

Oye, N. D., Salleh, M., & Iahad, N. A. (2011). Challenges of e-learning in Nigerian university education based on the experience of developed countries. *International Journal of Managing Information Technology*, 3(2), 39-48.

Palacios-Rodríguez, A., Llorente-Cejudo, C. & Cabero-Almenara, J. (2023) Editorial: Educational digital transformation: new technological challenges for competence development. *Front. Educ*. 8:1267939. doi: 10.3389/feduc.2023.12679

Panakaje, N., Ur Rahiman, H., Parvin, S. R., P, S., K, M., Yatheen, & Irfana, S. (2024). Revolutionizing pedagogy: navigating the integration of technology in higher education for teacher learning and performance enhancement. *Cogent Education*, *11*(1), 2308430.

Picciano, A. G. (2011). *Educational Leadership and Planning for Technology*. Pearson.

Seena, S. T., & Pillai, S. K. (2014). Impact of Web 2.0 Technology Applications in Kerala University Library: Library Professionals' Perspective. *DESIDOC Journal of Library & Information Technology*, *34*(5).

Shao, D., Mwangakala, H., Ishengoma, F., Mongi, H., Mambile, C., & Chali, F. (2023). Sustenance of the digital transformations induced by the COVID-19 pandemic response: Lessons from Tanzanian public sector. *Global Knowledge, Memory and Communication, 72*(6/7), 700-713.

Smith, S. J., & Basham, J. D. (2014). Designing online learning opportunities for students with disabilities. *Teaching Exceptional Children*, 46(5), 127-137.

Szymkowiak, A., Melović, B., Dabić, M., Jeganathan, K., & Kundi, G. S. (2021). Information technology and Gen Z: The role of teachers, the internet, and technology in the education of young people. *Technology in Society, 65*, 101565.

Trust, T., & Whalen, J. (2020). Teacher perceptions of professional development for technology integration: Considering the importance of the year-one experience. *Journal of Digital Learning in Teacher Education*, 36(2), 123-132.

USPF. (2018). *Universal Service Provision Fund*.

Vásquez-Peñafiel, M. S., Nuñez, P., & Cuestas Caza, J. (2023). Competencias digitales docentes en el contexto de COVID-19. Un enfoque cuantitativo. *Pixel-Bit: Revista de Medios y Educación, 67, 155-185.*

Walimbwa, M. (2023). Digital Transformation of Higher Education and Twenty-First-Century Skilling in Sub-Saharan Africa: Potentials and Challenges. Higher Education in Sub-Saharan Africa in the 21st Century: Pedagogy, Research and Community-Engagement, 313-325.

Willie, C. P., & Akarika, D. C. (2023). Integration strategies of media technologies in the teaching of primary schools in the rural areas of Akwa Ibom State. *Akwa Ibom State University Journal of Arts*, *4*(1), 1-17.