5 DIGITAL EDUCATION IMPLEMENTATION IN NIGERIAN LIBRARY AND INFORMATION SCIENCE SCHOOLS FOR STUDENTS' EFFECTIVE GLOBAL PARTICIPATION

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Abstract

Purpose: The study aims to identify Nigerian LIS schools that have adopted digital education, explore the digital infrastructures utilized, teaching resources employed, teaching platforms and strategies used, assessment methods in place, and the challenges faced in embracing digital education.

Methodology/Design/Approach: *This paper is an exploratory study in which review available and relevant literature on the digital education and its implementation in Library and Information Science schools was reviewed both from conceptual and empirical perspectives. A conceptual model was designed for this purpose. The study accessed a variety of databases through the EBSCO Host e-connect Library Online Catalogue, Institutional Repositories, Research Gate, and other relevant Library and Information Science journals, including the University of Nigeria's library electronic databases. Additionally, searches were conducted on journal databases such as Emerald Insight, as well as through Google search engine and Advanced Google to gather information beyond the university's domain. The keywords used in the searches included digital education, Library and Information Science schools, implementation, digital learning outcome, and global participation, among others.*

Findings: *The findings from the empirical evidences reveal the low extent of digital education adoption in Nigerian LIS schools, and the limited availability of digital infrastructures and teaching resources utilized, as well as teaching platforms and strategies employed.*

Implication: *The research underscores the need for enhanced digital infrastructure, innovative teaching strategies, and comprehensive support systems to overcome these challenges of digital education, thereby facilitating effective global participation of Nigerian LIS students in the digital era.*

Originality/value: *Among several benefits that digital education offers, it fosters students' engagement and facilitates skills that enable individuals to compete favourably in the larger society. Without digital education therefore, students who graduates from higher education may not be able to participate effectively in the global community. Again, they may not be able collaborate with their counterparts. The LIS educator is not left out in this noble call to implement digital education.*

Keywords: *Digital Education; Library and Information Science (LIS); Global Participation; Digital Infrastructures; Teaching Strategies; Digital Learning Outcome; LIS Digital Education Schema [LIS-DES]*

Introduction

Education has transcended the traditional practices of face to face teaching and learning to encompass a technology-assisted, learner-centered approach with diverse learning content and opportunities. The constant change in the socio-economic manner of human relationship has necessitated the need for adoption of the various changes in the ways of teaching and learning. Undoubtedly, digital technologies have facilitated learning in their various changes. As an evolving pedagogy, digital education has taken multifaceted approach, the aim of which is to facilitate change in learning while personalizing leaning (Prakash and Ibrahim, 2021; Blundell et al., 2016). Allan (cited in Mcilwhan, 2020) stated that, conducted at least partly in, with or through digital technologies, digital education encompasses using technology in a traditional classroom environment, a combination of online and face-to face learning (blended learning) or

learning carried out entirely online. Also referred to as online, virtual learning and as the use of digital tools with internet connections for teaching and learning, digital education offers flexibility, prompt information delivery, convenience, accessibility, and diversity in student experiences (Bankole, 2022). While it aims at changing the method of learning to focus on the learner, digital education enhances the skills and competencies for effective functioning in the digital age (European Agency for Special Needs and Inclusive Education; 2022) and the need to participate in global community.

Studies show that online learning (digital education) enhances knowledge exchange, communication, and performance (Alqahtani & Rajkhan, 2020; Selken, 2020). The minimum technological requirements for successful online learning include computers, mobile devices, webcams, listening devices, and video conferencing applications (Bankole, 2022). Borgohain, Nath, and Devi, (2020) stated that digital education is the most suitable teaching method for modern ICT environments, as the role of information professionals in teaching information literacy skills has grown. It can be provided in two modes: synchronous and asynchronous, allowing real-time interaction and access to training materials. Online teaching has become more mainstream globally, particularly in the Nigerian educational system, due to the COVID-19 pandemic. Digital education also foster students' engagement, promote individualized instruction, assess learning to strengthen instruction, advance assessment practices (Committee for Economic Development, nd), increase access to learning opportunities, personalize learning resources, make for flexibility in the learning content as well as to be generally accepted (Mcilwhan, R., 2020).

Library and Information Science schools as higher learning institutions and with the aim of training individuals on the appropriate strategies for managing information resources through effective collection, organization, dissemination and preservation is challenged by the digital environment and education specifically. In order to equip upcoming professionals for the digital age, Library and Information Science schools need to embrace digital education. This change entails using virtual infrastructures and platforms, interactive multimedia materials, and diverse teaching and evaluation strategies to improve accessibility and create a dynamic learning environment as well as more learning outcome. Library schools have the responsibility of equipping graduates (who will in turn facilitate digital learning in high institutions) with necessary skills through digital education whether through synchronous or asynchronous methods; thus enabling them gain competencies of digital library profession, include technological knowledge, library-related knowledge, (Okeji & Mayowa-Adebara, 2020), media utilization and teaching strategies.

It is worrisome, however, that while the call to embrace digital education is tilting to the positive dimension as well as opening for many institutions to embrace it, all too often, many institutions are still glued and sticking to the traditional forms of education. Inability to embrace digital education has left many students and graduates unskilled and inexperienced in various digital tools and systems. This may in future, render them incapable when it comes to competing favourably with their counterparts in the global community. Digital education has therefore become a necessity for participating and competing effectively in and outside the four walls of the Nigerian and African community to meet with the constant change in educational system and technological

development. Without it, individual who have graduated from the Library and Information Science schools may not actively be part of the continuous transformation. The question this study seeks to answer, therefore, is: to what extent is digital education implemented in Library and Information Science schools with regard to the Nigerian setting?

Objectives of the study

The major objective of this study is to explore the position of Library and Information Science schools in implementing digital education with regard to Nigerian setting. Specifically, this study intends to:

1. Identify Nigerian Library and Information Science schools that have adopted digital education;
2. Ascertain the digital infrastructures used by Nigerian Library and Information Science schools for digital education;
3. Find out the teaching resources used by Nigerian Library and Information Science schools for digital education;
4. Determine the teaching platform/strategies employed by Nigerian Library and Information Science schools for digital education;
5. Determine the evaluation strategies used by Nigerian Library and Information Science schools for digital education;
6. Identify challenges which Nigerian Library and Information Science schools face in embracing digital education

This paper is an exploratory study in which review available and relevant literature on the digital education and its implementation in Library and Information Science schools was reviewed both from conceptual and empirical perspectives. To achieve this, varieties of database were accessed on the EBSCO Host e-connect Library Online Catalogue Publications, Institutional Repositories, Research Gate, Publications and Library Journals of the University of Nigeria's library electronic databases collection. Searches were conducted in many journal databases, including Library and Information Science collection; websites of governmental and Non-governmental organizations; Emerald insight, among others. Also, Google search engine and Advanced Google were also used to broaden our search for relevant information from other websites that were outside the University of Nigeria's domain. Keywords were combined during the searches as well as use of other search techniques such as phrase searching, keyword search and Boolean logics.

The thesaurus that was built from the following keywords (Digital Education, Library and Information Science Schools, Implementation, Digital Learning Outcome, Global Participation) for the study to aid in our searches are represented in the table below:

Digital education	Library and Information Science school	Learning outcome	implement
Digital infrastructures	University Libraries	Improved Learning	Realize
Digital systems/Tools	Educational Institutions	Global participation	Achieve
Digital teaching pedagogies			Execute

Literature Review

Digital Education and Nigerian Library and Information Science Schools

Education, an activity that takes place in diverse ways and places venues is often intended to transform individuals into developing knowledge, understanding, values, growth, care and behaviour. This happens "when you sit in your house, and when you go on the way, and when you lie down and when you rise" (Chazan, 2022) and virtually anywhere; thus implying more of a process than a place. In a formal setting, technologies have revolutionized a lot of things in today's society; especially the human experience visible in the changing the way one learns. This has given birth to what we know to be "digital education". To understand digital education, it is imperative to understand the concept of education. Education as a process of learning or training in schools, is geared towards improving knowledge and developing skills and attitudes in the learner and also influencing permanent change in behaviour (Hornby, 2010). In the other hand, digital learning involves developing one's skills using digital tools, integrating the digital resources into the process of teaching and learning (Razak, 2021). It involves making use of a broad range of Information Communication Technologies (ICT) to develop learners with a more digital skill and knowledge using statistical reasoning to utilize digital tools in creative and technical ways to enhance teaching and learning (Marchionini, 2022).

Digital education, also known as Technology Enhanced Learning (TEL), virtual learning or e-learning, involves the creative use of digital tools, resources and innovations while teaching and learning; therefore exploring the use of emerging technology offers educators the ability in the courses they offer, to design interactive learning environments, which can take the form of mixed or entirely online programs and courses (Delgado Kloos et al., 2017; Banerjee et al., 2015; Celeste McLaughlin, 2018). When e-cable connections were established in Nigeria in 1996, the growth of telecommunications led to the development of e-learning (Ajadi, Salawu, & Adeoye, 2008). At that time, the most widely used e-learning format was lecture notes on CD-ROM, which the student could play whenever they wanted to. In the modern world, technology plays a crucial role in improving education and facilitating students' participation in their chosen fields of study. According to Ekwonwune and Oparah (2020), one idea that is altering the front-line knowledge acquisition in the modern educational setting is the use of virtual learning environments for teaching and learning provision. Developed nations enabled the creation of virtual universities, or universities based on ICT for education (Anekwe, 2017).

Countries, as stated by UNESCO (2020) have started leveraging ICTs to advance education, driving public institutions to get involved. As a result, there has been inequality in digital learning opportunities. This has equally been worsen by the COVID-19 pandemic; leaving one third of students without access to digital learning especially during the peak of the crisis in 2020. Thus, UNESCO guidelines canvass for inclusion, equity and gender equality in adopting ICTs in learning. The guideline also proposes planning framework geared towards examining the digital well-being of teachers and students and the readiness of the local education systems while assessing their needs. To this end, UNESCO brought strategic areas and subthemes for inclusion in the national ICT in education policies and masterpiece, among which are higher education- curriculum and assessment and digital learning resources. More recently, University of Oxford brought

out their digital education strategies, aimed at identifying areas in which digital education is capable of facilitating the realization of the commitments already given to education; while ensure all possible measures towards digital education (University of Oxford, 2023).

Only a very small number of traditional universities in Nigeria offer courses via virtual learning platforms. Virtual learning may still seem like a pipe dream to some educational institutions. Ajadi et al. (2008) state that because of advancements in the field of information and communication technology, the National Open University of Nigeria (NOUN), which was founded in July 1983 and is Nigeria's first distance learning post-secondary institution, has resumed its previously suspended online courses. Further, the authors stated that these changes in ICT have equally spurred some other government institutions to start acquiring facilities for online learning. This calculated action fosters a workforce that is tech-savvy and fits in with worldwide information management trends. Library and Information Science schools are schools of higher learning that train individuals on the appropriate collection, organization, dissemination and storage of information and information resources for posterity. Considering the great exploit being done in the digital environment, Nigerian Library schools can be said to still be a toddler in this regard. This is evident in the traditional methods still used in the delivery of knowledge. Also, many scholars have observed the obsolescence of the curriculum prescribed in the long extant 1999 edition of this document (Nwosu 2009, Diso 2009, Aina 2014). Aina (2014) demonstrated that the NUC curriculum only offers one course on ICT, "Automation in Libraries and Information Centres," and makes no allowances for knowledge management or entrepreneurship. For the education of library and information professionals in the twenty-first century, such a curriculum is therefore insufficient. Despite a revision in 2007, the high education course content in the resultant curriculum makes it unappealing to library schools. Therefore, it becomes necessary to update the official NUC curriculum for teaching library and information science in Nigeria to reflect current trends. In Africa and other developing nations, LIS schools do not engage in collaboration within their respective countries and regions. In the USA and Europe, the concept of collaboration is well-known and widely used. (Malhan and Singh). It is necessary to support digital education as well as any other developmental endeavour that will keep LIS on the concurrent list of courses offered in educational institutions across developing nations. To make the holder of a certificate in digital education a marketable, competent professional, skills in the field must complement theory. Courses and materials offered by LIS schools ought to align with the demands and standards of the labour market.

Digital Infrastructures used in Nigerian Library and Information Science Schools for Digital Education

Like other institutions, schools of Library and Information Science in Nigeria have the role of incorporating digital infrastructures to improve the quality of their curricula. For flexible access to lectures, course materials, and collaborative tools, they are charged to use online platforms in teaching delivery. Advanced software-equipped computer labs provide for practical instruction in digital archiving and information retrieval. Through strategic integration, students are better equipped to meet the changing demands of the digital era in information management. Mbagwu, Ozioko, & Ogueri, (2017) stated that ICT contents have been incorporated into LIS courses in Nigeria as a result of changes

in reference services and information forms. It is yet unknown, nevertheless, how much ICT infrastructure are used in LIS education. Learners anticipate excellent, user-friendly services, and having a strong ICT infrastructure is essential for being competitive in the information industry. Digital infrastructure and tools must be optimized in teaching library school curricula in order for upcoming librarians to gather skills for competitive labour force and adjust to the changing needs of their clients (Mbagwu, Ozioko, & Ogueri, 2017). Aramide and Ogunjobi (2021) recommended the adoption of a developed Digital Resource System in Ibadan School Library for improved information needs and academic performance of young people in high schools. The system includes Integrated Library Management Software, Learning Management System, and electronic resources; while Mbagwu, Ozioko, and Ogueri (2017) highlighted the lack of digital infrastructure in library teaching and learning, affecting LIS professionals due to factors like large class sizes and inadequate infrastructure. They further suggested an increased ICT training infrastructure, raising awareness about its importance, standardizing training facilities, and implementing them in library school programs. The lack of modern facilities in higher education, as opined by Owan, & Ekpenyong, (2022), hinders effective learning outcome. As the author stated, in the traditional classrooms, students complain about inadequate lecture halls, labs, libraries, and information resources. Universities are implementing digital libraries and lecture theaters to accommodate students. Integrating digital (electronic) infrastructure (EI) can provide unlimited access to education and resources, enhance collaboration, and remove barriers to effective learning. When digital infrastructures are suitably adopted, LIS educators would optimally utilize vast teaching resources available online for greater learning outcome.

Teaching Resources used for Digital Education

To improve learning, Nigerian Libraries and Information Science school educators should be able to create and use a variety of digital technologies and resources. Virtual libraries supply e-books, journals, and databases; online platforms offer lectures, interactive assignments, and collaboration spaces. Different learning styles are accommodated by multimedia features such as interactive simulations and video lectures. Instructional resources expand the scope of the curriculum and give students the technological know-how they need to succeed in the rapidly changing sector. Digital education resources are available for teachers to use in lesson plans, covering various subjects and levels of education. According to Bixler (2021) these resources include simulations, interactive models, graphics, videos, and online assessments. Teachers can also use podcasts, audio, educational games; literature, primary source documents, interactive maps, and tools like graphing calculators. Digital textbooks are quick and easy to access, while online assessments provide instant data and engagement. As the author noted, interactive maps and full online courses offer hands-on learning experiences and allow students to work on their own learning goals.

Teachers' employment of digital tools and resources to improve engagement and access to information as technology to catalyze interactive learning experiences have been discussed by several authors(Dillon, 2023, Diaz, 2023), Mhouti, Nasseh, & Erradi, 2013)). The rise of technology in classrooms has become the new normal, with e-learning becoming increasingly popular. What are the strategies employed t deliver digital education in Nigerian universities.

Strategies employed for delivering Digital Education in Universities

In order to create interesting learning environments, digital education initiatives in universities make use of a variety of platforms and approaches. Among them are asynchronous learning, social media, interactive multimedia components, virtual labs, video conferencing, learning management systems (LMS), and virtual classrooms. Utilizing technologies to improve learning encourages accessibility and establishes vibrant, welcoming learning environments in post-secondary educational establishments. Thus Taylor and Skelton (2022) are of the view that digital learning strategy in higher education institutions can overcome time and distance barriers, offering flexibility and accessibility to serve current students and attract new students and (Mehta & Downs, 2016) argue that technologies have significantly impacted corporate learning and leadership development, with the rise of online courses and new media platforms. Teaching strategies inform digital strategy, with digital platforms mostly being utilized to offer pre-existing content and achieve a more enhanced learning outcome, through learner engagement and content delivery. The landscape of achieving effective teaching strategies using digital technologies is changing, necessitating new definitions (Hashim & Matthews, 2022). Digital technologies revolutionize education by simplifying instructional materials; however, if different teaching techniques are not optimally while promoting collaboration and effective learning outcome. They enable remote learning, promote students engagement, fostering creativity and delivery success, and ultimately makes education more interactive and engaging (Haleem, Javaid, Qadri, & Suman, 2022) noted by the University of Gloucestershire (2023). It is noteworthy that digital technology have created online teaching strategies to encouraged remote learning and increased teaching productivity. They have developed inclusive learning environments, increased knowledge and understanding skills, and established virtual classrooms (Haleem, Javaid, Qadri, & Suman, 2022).

Ways of evaluating digital education for greater impact

Evaluating digital education involves a comprehensive approach to assess the effectiveness of learning experiences and educational objectives. It involves monitoring students' engagement, assessing learning outcomes, using feedback mechanisms, tracking the performance of digital tools, and continuously analyzing data to provide insights into students' progress and tailor education strategies. This comprehensive evaluation provides a holistic understanding of the impact of digital education on students' learning. Evaluation is needed to identify high-quality resources in academic, pedagogical, didactic, and technical fields (Mhouti, Nasseh, & Erradi, 2013). Quality criteria for summative evaluations can drive improvements in design practice. When implementing a blended learning model, it is crucial to critically evaluate digital curricular resources to meet Common Core State Standards and meet budget constraints (Hudson, 2014). Being aware of these criteria is essential for developing evaluation instruments like evaluation grids or software tools.

Finding high-quality digital content and evaluating its authenticity, dependability, and authorship are essential. As per Natlib (2023), the following instruments are available for assessing digital content: SIFT (the acronym for Stop, Investigate the source, Find better coverage, and Trace claims, quotes, and media to the original context; The five Ws of website assessment are Who, What, When, Where, and Why: applying the

CRAAP test —Currency, Relevance, Authority, Accuracy, and Purpose; RADCAB —Relevance, Appropriateness, Detail, Currency, Authority and Bias. By evaluating digital content, individuals can ensure the accuracy, validity, and currency of their information. A thorough evaluation involves defining goals, honoring learning principles, research analysis, and focusing on student empowerment and critical thinking (Hudson). Online tests, group projects, and peer reviews are also some examples of assessment techniques which could be employed to ensure proper delivery of digital education and pedagogies.

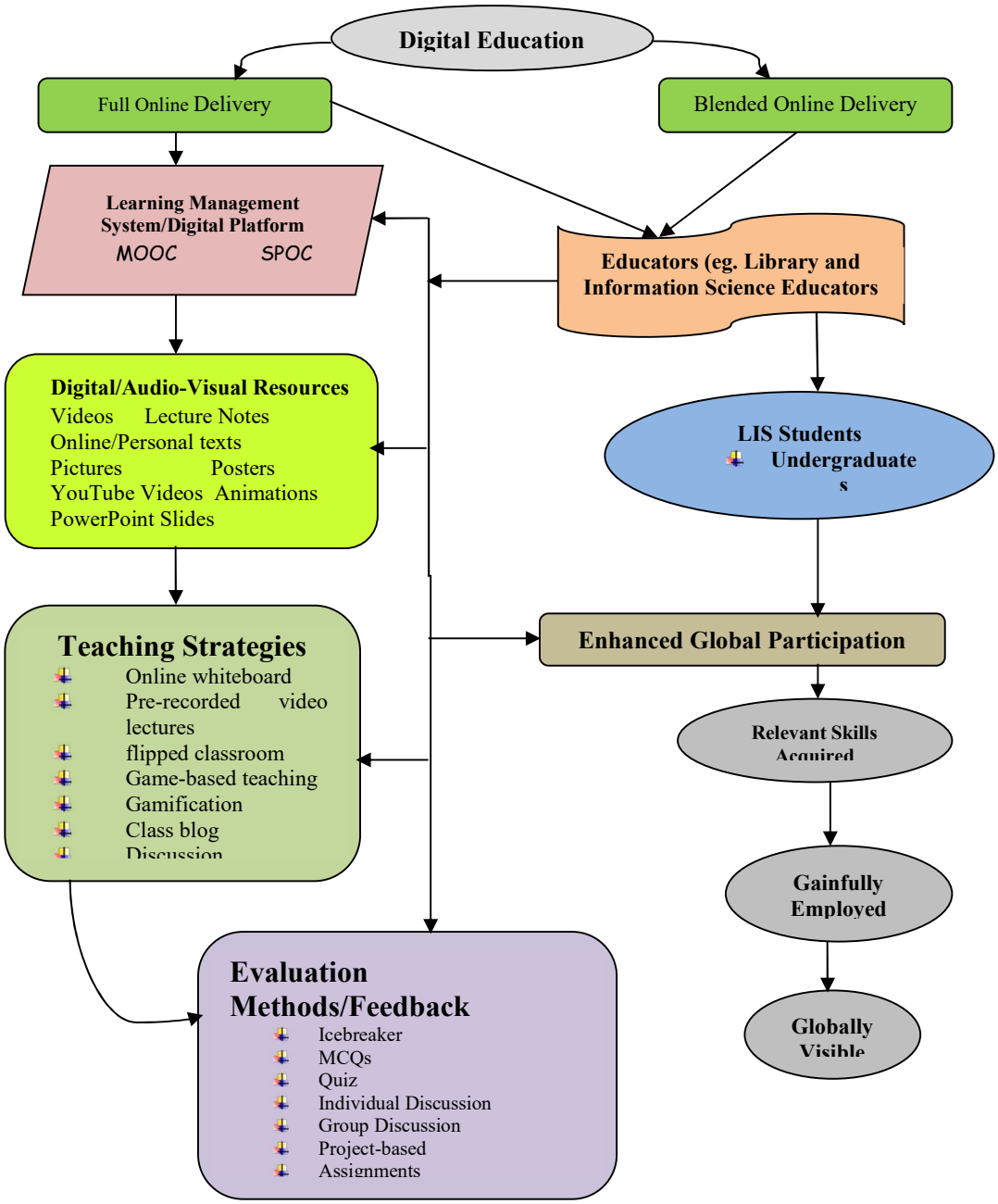

Figure 1: Digital Learning, Enhanced Learning outcome and Effective Global Participation: LIS Digital Education Schema [LIS-DES]

The above LIS Digital Education Schema [LIS-DES] is a schematic representation of digital education from the categories of blended and full online delivery; representing the LIS educators involvement whether in a large or small group. The model also presents the four major considerations for effective digital education which could give rise to effective global participation through skills acquired, gainful employment and global visibility.

1. Selection of the learning management system which could be for a large group (in form of Massive Open Online Courses - MOOC or Small Private Online Courses - SPOC). The digital platform has an influence on the entire digital education.
2. Consideration of the digital/audio-visual resources to use in delivering digital education also has great impact on the success of the delivery. These may include videos, lecture notes, online or personal texts material, pictures, posters, YouTube videos, animations, PowerPoint slides.
3. Teaching strategies also has a great influence on the overall success of the digital education. Optimizing different teaching strategies like Pre-recorded videos, live lectures, online whiteboard, flipped classroom Game-based teaching, game-based learning and gamification, class blog, discussions, etc., could help realizing positive learning outcome.
4. Finally, it is always important to evaluate both the course taught as well as the digital education as a process and as a program. Evaluation methods or feedback mechanism could include the use of quizzes, icebreakers, multiple choice questions (MCQs), individual or group discussion, project-based assignments, etc.

Empirical evidence of digital education implementation from the Nigerian perspectives

The researchers' empirical review will focus on the extent of implementation of digital education in Nigerian universities. Specifically, infrastructure used, digital platforms optimized, digital resources utilized, and teacher and evaluation strategies employed will be looked into as well as challenges encountered in implementing digital education in Nigerian Universities. In a study conducted by Dele-Ajayi and Taddese (2020) on realising the potential of technology in education-EdTech in Nigeria, the aim of the empirical review was examine the potential of technology in education, focusing on EdTech in Nigeria through a rapid scan of policies, infrastructure, partners, and initiatives. The research highlights key policies like the National ICT Policy and the National Policy on ICT in Education set by the Ministry of Communication Technology and the Federal Ministry of Education, respectively. Infrastructural challenges discovered by the study include low computer ownership, limited access to electricity, and inadequate data on technology availability in schools. The Federal Ministry of Education plays a pivotal role in EdTech policy formulation, collaborating with other government bodies like the Federal Ministry of Communications and education authorities at federal and state levels. However, government funding for EdTech remains limited, with initiatives largely led by NGOs, startups, and international organizations. It underscores the significance of key policies like the

National ICT Policy and the National Policy on ICT in Education, set by relevant ministries.

Anene et al. (2014) investigated the issue and future potential of e-learning in Nigerian universities in a different study. This study looked into e-learning in universities in Nigeria. The goal was to ascertain whether or not Nigerian universities had the resources and infrastructure necessary for online learning, as well as whether or not students could use these resources to further their education. In order to do this, the study's sample consisted of 228 students from each of Nigeria's six geopolitical zones. The study's conclusions showed that inadequate infrastructure is a significant barrier to the adoption of information and communication technology. The majority of the students who participated in the study stated that the main issues were the scarcity of e-learning library resources, online seminars, instructor discussions, online exams, and bandwidth constraints. Years later, a study on the availability and use of ICT facilities for teaching and learning of Library and Information Science (LIS) undergraduate programmes in universities in South-South, Nigeria, was carried out by Ali, Nwafor, and Onoh (2019). For the design/methodology, the researchers employed a descriptive survey research design. It was found that all six of the universities under investigation had computers, a local area network (LAN), a standby generator, an uninterrupted power supply, and internet access (UPS). These universities had no access to any other ICT resources, such as radios, projectors, or styluses. Kolawole & Mutula (2017) again studied the extent of teaching with Web 2.0 technologies in selected federal universities in South West Nigeria taking into consideration its integration into teaching as well as the factors influencing its use for teaching purposes240 academics from the faculties of technology, sciences, and veterinary medicine were chosen with the help of the updated DeLone and McLean (D&M) Model of Information Systems Success. The findings showed that while Web 2.0 adoption for teaching purposes is still low in Nigerian universities, it appears to be increasing. Furthermore, academic staff technology adoption and use was influenced by three main factors: system quality, information quality, and service quality.

In another recent study, Onwueme et al. (2019) assessed library and information science instruction at a few Nigerian universities in a different recent study. In order to determine the current state of LIS education and training in Nigeria, the study set out to explore the viewpoint of final-year students at LIS schools in that country. This was made necessary by the expectation that soon-to-be LIS school graduates will be fully formed and equipped to provide timely and relevant information services to both their immediate community and society at large. This is especially true in this day and age, when the continued advancement of ICTs in the profession has increased expectations for LIS professionals to be change agents and development agents in Nigeria. The research design used in the study was a descriptive survey, with simple random sampling. The instrument used to collect the data was the questionnaire. The final-year students of three specifically chosen LIS schools in the southern region of Nigeria—University of Benin, Benin (UNIBEN), University of Ibadan, Ibadan (UI), and University of Nigeria, Nsukka (UNN)—were the study's target population. There were 150 students enrolled in each of the three LIS schools that were chosen. Out of the entire study population, 110 people made up the sample size. Percentages were used to analyse the responses. According to the studies, a significant proportion of the current student body is female and falls into the 20–24 age

range. Students at the Library School generally have low access to and use of ICTs, especially on a daily basis. The main issues facing students in the Library Schools are power outages, subpar computers, and restricted access to and use of ICT in the departmental libraries and computer laboratories.

Ahiazu et al. (2020) evaluated the ICT proficiency of Library and Information Science (LIS) instructors in preparation for Rivers State's implementation of blended learning. With 45 participants, the study used a descriptive survey design. To sample all 45 library educators from Rivers' four library schools, a census sampling technique was used. The study employed a structured questionnaire to collect data. 42 instrument copies were received back and determined to be suitable for examination. Merely utilizing percentages and mean scores, the collected data were analysed. The results showed that LIS educators were not implementing blended learning, even though they could use new media, mobile, and basic computer interfaces for it. Lack of resources, including policies, expertise, and facilities, was cited as the cause of the problems. Therefore, it was suggested, among other things, that the Nigerian Librarians' Registration Council create a policy that will encourage and direct the use of blended learning in LIS education and that LIS educators should train in order to take advantage of blended learning.

The effects of digitization in education were looked at in a study by Arisoy (2022). The researcher used a qualitative approach to her study. Twenty professionals who are experienced managers in the field of education who work in the private sector made up the study's population. An interview form that was semi-structured was used to gather data. By coding the data and identifying the codes, categories, and themes, the researched data was analysed using the content analysis method. The results were defined and interpreted, and these codes, categories, and themes were arranged. The study uncovered people's concerns regarding the digitalization of education, the scarcity of real educational resources, the inferiority of digital learning over in-person instruction, and the lack of digital literacy. In order to maximize the effectiveness of education, the researcher suggests organizing educational content using technological opportunities, developing virtual reality-infused educational materials, and implementing gamification.

Furthermore, a study by Egielewa et al. (2022) titled COVID-19 sought to investigate digitised education. It examined students' perceptions of Nigerian higher education institutions using the new digital culture brought about by the COVID-19 pandemic, specifically online learning (i.e., e-learning), which has become commonplace both globally and specifically in Nigeria. Based on the student state residence location, the study employed quantitative survey methods and a sample size of 1134 Nigerian students from the three types of higher education institutions in Nigeria: universities, polytechnics, and colleges of higher education. In June and July of 2020, the respondents answered a Google Forms questionnaire. According to the study, students do not like the virtual learning that many colleges and universities across the nation implemented during the COVID-19 lockdown, and they do not want to continue learning online after the pandemic because of inadequate internet infrastructure and power outages.

Researching further, David-West (2022) investigated digital literacy skills and utilization of online platforms for teaching by LIS educators in universities in Rivers State,

Nigeria. The study was undertaken as a descriptive survey design. Three research questions and three hypotheses guided this study. The population of the study was twenty-six lecturers from the three universities in Rivers State where library and information science are offered. The twenty-six lecturers constitute the sample size. Census sampling technique was adopted for the study. The questionnaire instrument was used to elicit information from the respondents. Twenty-six copies of the questionnaire were administered and retrieved. Mean ($\bar{x}$) was used to analyse the research questions and the null hypotheses was tested with t-test at 0.05 level of significance. According to the study, there is no discernible difference between LIS instructors at Rivers State University's use of online learning platforms and their level of digital literacy. Additional research showed that LIS educators lack the abilities needed to successfully navigate the online learning environment on their own. Finally, in order to keep up with global practice, LIS educators need to be creative and keep their skills up to date.

Recently, Wada et al. (2023) conducted research on how undergraduate library and information science students at the University of Maiduguri, Nigeria, used ICT skills and blended learning during the COVID-19 pandemic. As undergraduate students return to the University of Maiduguri in Borno State amid the COVID-19 pandemic, this study examined their ICT proficiency in relation to their expectations for blended learning. For this study, a survey research design was employed. For this study, there was one hypothesis and two research questions. A sample of 306 respondents, drawn from the target population of 1,500 Library and Information Science students, participated in the study using a questionnaire as the instrument for data collection. Inferential statistics of PPMC and descriptive statistics of frequency count, percentage, mean, and standard deviation were employed in the data analysis. According to Wada et al.'s study, undergraduate students' ICT proficiency was below average, and they had low expectations for blended learning. Nonetheless, the correlation coefficient ($r=0.285$) and the p-value $< a=0.05$ and $<\alpha=0.0$ showed that there is a weak but statistically significant positive relationship between undergraduate students' expectations for blended learning and their ICT skills when taking library courses at the University of Maiduguri. It is also found that undergraduate students' expectations on BL can only be influenced by 28.5% of their current ICT proficiency.

Most recently, Ibrahim, et al. (2023) examined whether undergraduate students' cognitive experiences with using digital devices influenced their behaviour towards the conduct of e-assessment in Nigerian universities in a study on digitalizing educational assessments in a Nigerian university. It also looked at whether students' varied experiences with digital space across different platforms had a big impact on how they behaved when it came to e-assessment in Nigerian universities. In this study, an ex post facto research design was used. During the 2020–2021 academic year, 280 Part 3 undergraduate students from a public university in Jigawa state were chosen as the sample. Data were collected using a questionnaire, and Chi-Square (χ 2) and Pearson Product Moment Correlation were used to analyse the results. Additionally, a basic percentile analysis method was used. Additionally, a basic percentage statistical method was used to perform percentile analysis. According to the findings, students' digital experiences had a big impact on how they behaved when it came to e-assessment in Nigerian universities. Additionally, students' perceptions of the effectiveness of

e-assessment delivery in Nigerian universities were greatly influenced by their digital experiences. Furthermore, how students interacted with the digital world on various platforms and in different ways had a big impact on how they behaved when it came to e-assessment in Nigerian universities.

Haleem, Javaid, Qadri, and Suman (2022) embarked on a study aimed at reviewing and understanding the role of digital technologies in education. The empirical review delves into the integral role of digital technologies in advancing the United Nations' sustainable development goal of quality education by 2030. With a focus on inclusivity and equity, digital tools are identified as crucial enablers for achieving these objectives. These technologies not only facilitate emissions reduction and environmental sustainability but also revolutionize the education landscape. The COVID-19 pandemic has accelerated the adoption of digital tools in education, transforming it into a dynamic, interactive, and inclusive process. Students now leverage software and online resources to enhance learning, shifting from traditional methods to more engaging and efficient digital platforms. Despite the benefits, challenges such as access and digital literacy remain, underscoring the need for continued investment and innovation in digital education.

It is of important to note that technological advancements in our society have brought about significant and tremendous changes to the Library and Information Science (LIS) education globally and Nigeria in particular. In other words, the LIS education has been experiencing exponential and radical changes in the last couple of decades which results to fundamental approach to LIS education. This however has not been without some glaring challenges associated with delivering digital education in LIS schools. These challenges were enunciated by Bappah (2014) in a study titled "Rethinking E- Learning in Library and Information Science (LIS) Education in Nigeria: Developing a Model for the 21st Century, opined that Challenges of e-Learning is a major threat to the growth of LIS Education in Nigeria. The study was guided by a general purpose of establishing the need to propose a framework that takes into consideration the vital aspects in curriculum development and 3 specific objectives which include to: explore the current situation regarding e-learning in LIS schools, identify the state of the art in the global LIS schools regarding e-learning, identify the challenges facing the adoption of e-learning in LIS schools in the Nigeria. The research methodology for the study included content analysis of the information and the administration of an online survey. The Librarians' Registration Council of Nigeria (LRCN) website and a few documents supplied by LIS schools served as sources of data for the study. The findings of the study showed that the challenges facing e-Learning in LIS schools include technological challenges which is a fundamental requirement for the development of any potential e-learning programme, lack of skilled personnel in LIS schools across the country, inarticulate LIS curriculum, management and financial challenges, and others. The findings of this study by Bappah (2014) could be used to proffer solutions to the challenges facing delivering digital services for LIS education in Nigeria LIS schools. This is because of the fact that it is similar to the present study in the title, scope and objectives.

Recommendations

Efforts are being made to implement learning that is digital-driven in the Nigerian higher learning system. Nevertheless, recent literature shows that different authors have

pointed out the challenges that face digital education implementation in Nigerian higher education. Based on this, the following recommendations are made:

Facilitating the implementation of Digital Education

The policy makers and management of Nigerian higher institutions should brace up to the challenges of facilitating the implementation of digital education in the system. This could be realized through the provision of enabling digital learning environment such as digital infrastructures, platforms and resources that enhance learning outcome. They should also provide training opportunities both train-the-trainers and other trainees. This way both educators and students would enjoy the environment, as well as compete favourably in the society.

Developing Digital-driven LIS Curriculum

Library and Information Science should look into the curriculum and provide strategies for delivering the content through digital platforms: fully or in a blended way. The departmental administration should build the curriculum to lend themselves to digital systems and tools so that the educators will begin to chart ways of designing them for this purpose. Again they should find ways of facilitating LIS educators' and students' access to digital tools and other technologies so as to make digital education effective while building their competence for positive learning experiences and outcome as well as global participation.

Organizing Workshops and Seminars for LIS Educators and Students

This can only be achieved organizing workshops and inviting digital educators and those who are tech-savvy to assist in facilitating skills acquisition relevant for effective digital education. When both educators are fully competent in digital pedagogical delivery; and students become fully ready and knowledgeable in participating, the learning experiences and outcomes would be effective, enjoyable and satisfactory. Then they begin to deliver their courses digitally, both synchronically and asynchronically. LIS students are also expected to gain knowledge of the essence of engaging in digital learning especially as it contributes to effective global participation. The global market place calls for individuals who are skilled as it concerns the use of digital technologies. Developing these skills would enable them participate effectively in their learning and also be able to compete favourable when they graduate.

Creating Digital Learning Environment and Resources

Further, academic libraries would begin to assess their roles in providing aid to digital learning and resources for lecturers and students who are involved in this learning system. When they provide enabling digital learning environments for students who have challenges with keying into the learning process and doing their assignments, the learning process and outcome would become effective for students. This study would also help researchers in Nigeria and beyond to get research findings that are timely through collaboration with other researchers on digital education including the digital infrastructures, platforms and resources as well as pedagogical strategies. It would eventually help researchers to embrace the digital education and technologies as a means of effective learning and global participation.

Encourage research on the perception of Educators and Students

Higher institutions should explore students' view on implementation of digital educator, their experiences and challenges through interactive platforms so as to chart better courses for effective pedagogical delivery of

digital learning in Nigeria. Again, Higher institutions should encourage research geared toward ascertain the extent of implementations of digital education, fears of educators and students on embracing blended or full digital learning and best practices of digital education.

Challenging the Challenges of Digital Education

From the findings it is recommended that administrators of higher education should work to ameliorate the challenges of digital education. First, they should provide digital infrastructures with user-friendly interface to facilitate digital learning outcome that is positive. This could be achieved through improved funding to for acquiring these infrastructures and creating platforms that are sustainable and could improve curriculum delivery. Again, contents should be developed in a way that students would not be overburdened with so much heavy workloads while internet facilities should be functional.

Conclusion

Digital education has been generically viewed as a phenomenon which emphasizes all pedagogical delivery in the digital environment. Digital education has been birthed by digital transformation which has affected all spheres of lives including education. Among several benefits that digital education offers, it fosters students' engagement and facilitates skills that enable individuals to compete favourably in the larger society. Without digital education therefore, students who graduates from higher education may not be able to participate effectively in the global community. Again, they may not be able collaborate with their counterparts. LIS educator is not left out in this noble call to implement digital education.

Despite the call to embrace digital education, many of the LIS schools, as research shows, are being challenged by several factors that inhibit its implementation. With regards to the Nigerian communities, there is move towards implementing digital education, though it is still not fully implemented in library schools. The implication therefore is for concerned stakeholders: education policy makers and higher education administrators, LIS schools, LIS educators and students and all to continue to strive towards implementing digital education creating favorable digital environment and organizing training and workshop geared towards effective digital education implementation in Nigeria. The challenges are many, yet therein lies the implementation of digital education in Nigerian higher education.

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