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November 2022

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Identifying an Analytical Framework to Assess the Determinants of ICT Adoption in Libraries and its Implications for Teaching and Learning during Insecurity

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Abstract

The security situation in Nigeria, particularly in the country's North-West and North-Central Zones, has forced the closure of many educational institutions. Teaching and learning have become more erratic as a result of this. This issue has far-reaching repercussions for librarians and information specialists. Libraries have long been regarded and recognized by educational institutions for their contribution to high-quality teaching and learning. Several studies have found that information and communication technology (ICT) can improve teaching and learning by facilitating access to information. As a result, governments and school administrators have been working to promote the use of ICT in libraries to aid teaching and learning. Despite these efforts, ICT adoption is still very low in most primary and secondary schools in Nigeria. This research conducted a conceptual analysis based on a literature search to identify the major criteria that should be considered when promoting the adoption of ICT in libraries to enhance quality teaching and learning in the face of security problems.

Keywords: Insecurity, ICT adoption, Library, Teaching, Learning, Nigeria

1. Introduction

Insecurity refers to a situation in which people are in danger and vulnerable, frequently as a result of their vulnerability to attacks or injuries that has an impact on their social, economic, and educational development. Security is critical in the school setting the tone for high-quality teaching and learning. Insecurity in the school environment has increased dramatically in Nigeria. Since the abductions in Chibok, Borno, in 2014; Daphchi, Yobe, in 2018; and Faskari, Katsina, in 2021, to name a few, this has become more evident. The problem is exacerbated by recent surges in armed banditry and kidnapping for ransom of students and instructors in the

school environment. As of the 4th of November 2021, (1446) students and (24) members of the education sector had been kidnapped in Nigeria, according to a situational analysis of threats (Global Partnership for Education (GPE), 2022). Additionally, 76 percent of reported instances in 2020 were in the northern states, with the north-western part of the country seeing the majority of attacks. This condition of affairs has had a significant impact on educational activities, as well as on the quality of teaching and learning. As a result, governments, school administrators, teachers, and a variety of other stakeholders must determine what factors must be addressed to lessen the impact of insecurity on the school ecosystem.

Many academics and public pundits have proposed new approaches and initiatives to improve school teaching and learning activities. Traditional media such as radio and television are among these methods. The current state of insecurity in Nigerian schools, according to this paper, has highlighted the need for a major turning point in the country's educational system. As a result, ICT adoption and utilization can act as a panacea for reducing the impact of insecurity and its repercussions on information delivery and teaching and learning. In the midst of the noxious insecurity situation, a paradigm shift toward ICT adoption, including e-library adoption, online content choice, open education resources, and new communication channels like webinars and social media, could serve as viable alternatives to face-to-face library services and the chalk-talk teaching method. Although there are many definitions of "ICT adoption" in the context of this study, it is defined as the acceptance and use of technology and new innovations – computers, internet, Wi-Fi, web 2.0, mobile devices, online education, and digital libraries – to provide quality teaching and learning in an uncertain environment.

Several academics have discussed information and communication technology (ICT) adoption in the sphere of education in the face of various challenges (Moreno-Morilla, Guzman-Simon &

Garcia-Jimenez, 2021; Pongsakdi, Kortelainen & Veermans, 2021; Rahmat, Reza, Zahid, Abbas, Mohd Sobir & Sidiki, 2021; Jain, 2013; Omidinia, Masrom, and Selamat, 2011). For example, In light of the growing worldwide public health issues posed by the COVID-19 pandemic, it has been suggested that using ICT for learning is no longer optional but rather required (Cabezas-Gonzales, Casillas-Martin & Garcia-Valcarcel, 2021). In addition, Rahmat et al. (2021) investigate the relationship between integrating the technological readiness 2.0 indexes and students' uptake of e-library services during the Coronavirus pandemic. The study found that the utilization of technology and online services helped students meet their learning needs during the pandemic. ICT use has altered fresh learning opportunities for school children, notably reading and writing text in social space (Moreno-Morilla, Guzman-Simon, and Garcia-Jimenez, 2021). Similarly, Pongsakdi, Kortelainen, and Veermans (2021) point out that increasing teachers' digital technology usage can help schools prepare for twenty-first-century expectations. In addition, Jain (2013) summarizes the areas where ICT has had a significant impact, stating that "education, culture, teaching, learning, research, scholarly communication, libraries and information centers, medical health, agriculture, and so on" are among them (p. 135). As a result, Omidinia, Masrom, and Selamat (2011) conclude that ICT is not only essential to educational institutions, but also crucial to the same effect. Furthermore, many studies have also demonstrated the importance of information technology to libraries, information professionals, and users. ICT adoption and utilization, for example, has rejuvenated and altered library information service delivery, according to Paulson (2021). Besides, the introduction of ICT into libraries (Issa, Blessing, & Daura, 2009) is seen to have transformed them into educators who teach users how to 'find, use, and evaluate' material in a digital environment.

Given the increasing relevance of ICT in educational growth, all levels of government in Nigeria (Federal, State, and Local) must implement processes, policies, and techniques to encourage its acceptance and usage in educational institutions and libraries. Through literacy development, education has a vital role in the development of individuals and their social, economic, and political life. Although, in Nigeria, like in many developing countries, ICT adoption in educational institutions and libraries is beset by a slew of obstacles, including budgetary limits and a lack of digital literacy among students and teachers (Moreno-Morilla, Guzman-Simon & Garcia-Jimenez, 2021), as well as insufficient policies and infrastructure (Ejiroghene, 2021; Jain, 2013). Furthermore, many students and teachers lack the financial resources to purchase a computer and have insufficient digital abilities and competencies (Marlen & Isael, 2021). There is also a lack of standards, financial, technological, and organizational resources (Igbinovia, 2021; Liang & Chen, 2020). Other current issues include digitization trauma and a lack of technology infrastructure (Jain, 2013).

ICT adoption in libraries and educational institutions has sparked numerous academic debates over the years. The factors that influence ICT adoption in libraries to improve the quality of teaching and learning despite insecurity in Nigerian educational institutions are not yet subject to a systematic and thorough review. This study offers a multi-level overview of the factors influencing ICT adoption in libraries as a result. The article started by examining individual factors including digital competence and skills. It also looked at technological determinants including open educational resources and communication platforms. Third, it looks at infrastructure and policy as important environmental factors that influence the use of ICT in libraries. The importance of this study for policy direction and administrative decisions in

schools is to advance pertinent knowledge that can be used to advance the adoption of ICT to improve quality teaching and learning in the face of insecurity.

2. Methodology

This study aims to investigate the factors that influence ICT adoption in enhancing quality teaching and learning as well as information service delivery in an unstable environment. The study expressly focuses on the factors that influence ICT adoption in libraries in the face of insecurity. Numerous web databases were methodically and thoroughly explored in order to make sure the study is comprehensive enough. Online databases such as Science Direct, ProQuest, Google Scholar, Taylor & Francis, and Emerald Insight are among those that are searched. The terms "ICT determinants," "ICT theories and models," "adoption," and "insecurity" were used as descriptors for the search. No time limit was set for the scope of the search. The paper, however, ensures that only recent and various genres of literature were included in the analysis. The novelty of this study lies in the dearth of prior research on the subject, and as a result the study's theoretical stance is deduced from the literature survey and a few theories about technology adoption. The review extrapolates factors that affect ICT adoption from many contexts that served as the study's foundation.

3. Theoretical Based

This paper is supported by a broad theoretical framework. The factors of technology adoption in education and in the context of libraries are investigated using a wide range of theories and models. These theories and models include the Theory of Planned Behavior, the Unified Theory of Acceptance and Use of Technology (UTAUT), the Technology Acceptance Models (TAM) (Davis, 1989), and UTAUT2 (Venkatesh et al., 2003; Venkatesh et al., 2013). These theories emphasized the individual aspects of ICT adoption. The Technology Organization and

Environmental (TOE) Framework, the Diffusion of Innovation (DOI) Model, and the Institutional Theory, on the other hand, concentrate on organizational aspects (Tornatzky & Fleischer, 1990; Rogers, 1995; Scott, 2002). However, many academics have expressed grave concerns about the diversity of the theories and models. For instance, Tondeur et al. (2021) contend that "some diversity in models can be valuable to focus on different aspects and inform technology integration in education, but too much diversity may be counterproductive as it impedes the accumulation of knowledge and fails to provide coherent guidelines for practitioners." (p. 2). In light of this, it is acceptable to state that the teaching and learning environment, as well as the library, are dealing with numerous changes and difficulties that seem to arise every day. The COVID-19 pandemic, kidnappings for ransom, school shootings, and the challenges of adopting new technologies are a few examples. In such a circumstance, a generalized theory or model cannot be used to solve these various issues. Hoffmann, Lutz, and Meckel (2014) had a similar perspective and discovered that heterogeneity in IS research can be minimized by combining the results from many antecedents. Consequently, a multiple-level perspective strategy is required.

4. A Conceptual Model of ICT Adoption Factors in Libraries in an Uncertain World

The study developed a multi-level analytical framework (see Figure 1) in accordance with established technology adoption theories and pertinent literature that were drawn from current research works in order to explore the determinants of ICT adoption in a library for high-quality teaching and learning in a risky environment. The inventiveness of this study is derived from earlier studies on technology uptake. In particular, the study by Kaba (2019) offers a compelling method for creating the analytical framework.

4.1. Individual Perspective

According to studies by Liebenberg & Pather (2021), Totolo (2021), Acheampong et al. (2016), Hoffmann, Lutz & Meckel (2014), Kim, Kim, & Kim (2010), Hong et al. (2002), and Davis (1989), individual users' acceptance, belief, and attitude are significant factors of technology adoption. For Davis (1989), two primary factors—perception that the information system will enhance their occupational functions and belief that it is challenging to use and of little benefit to their functions—are responsible for system utilization. Davis referred to these two ideas as "perceived usefulness" and "perceived ease of use". Other factors have been proposed as significant influencers of technology acceptance and use, including affordability, effort expectation, performance expectation, computer self-efficacy, and technological expertise (Liebenberg & Pather, 2021; Acheampong et al., 2016; Hong et al., 2002). The results of a study (Totolo, 2021) showed that perceived ease of use and computer phobia have an impact on secondary schools' adoption of technology. Additionally discovered to have a significant indirect influence on users' inclination to utilize mobile library applications are external factors like habits and system quality (Rafique & Bashir, 2020). In the context of this study, ICT skills and competencies are also seen as significant predictors of ICT adoption and use.

4.1.1. ICT Skills and competencies

Having the necessary skills is essential for ICT uptake and use, as well as for librarians, teachers, and students. The difficulties with ICT skills have been highlighted in several studies on ICT adoption (Liebenberg & Pather, 2021; Kundu & Bej, 2020; Kaba, 2019; Hinostroza, 2018; Mingaine, 2013). The results of the research' analyses demonstrate that the ICT proficiency of teachers, librarians, and students is generally low in developing nations. For instance, in a recent study (Liebenberg & Pather, 2021); they noted that the lack of ICT skills in South Africa is

largely to blame for the country's poor use and acceptance of the internet. Inadequate ICT skills among teachers were recognized by Kundu & Bej's (2020) study as the primary factor influencing the adoption and integration of ICT for teaching and learning in private high schools in India. Similar to this, Mingaine (2013) points out that a lack of ICT skills is to blame for the low acceptance and use of ICT in Kenya's public secondary schools. Similar findings have also been reported in Nigeria (Ashcroft & Watts, 2005).

Many nations have recognized the value of educating students for digital skills (Johannes et al., 2020). Governments and school administrators should place a high priority on digital literacy skills including information literacy, ICT skills, and media literacy in the specific instance of adoption and use of ICT for teaching, learning, and library services during a scenario of insecurity. These skill sets are crucial for educators, students, and librarians to deal with the challenging situations brought on by insecurity. It is significant to recognize that the current teaching, learning, and library settings are changing on a worldwide scale. These processes are currently computer-driven and provided digitally. In order to appreciate the advantages of ICT in expanding learning, communication, collaboration, and knowledge creation choices, learners, teachers, and librarians must develop digital skills.

Information literacy is the capacity to recognize when knowledge is required and to quickly and morally access, evaluate, and apply that knowledge. An illustration would be looking for information online or from other sources (such as web 2.0, e-library, search engines, databases, and national and institutional information repositories). Learners and their teachers would be able to access databases that are available online or in the library, as well as internet resources (such as scientific research, education, public policy, and legal regulations). They would also be able to access e-resources (such as e-books, e-journals, and e-magazines). Teachers will also be

able to deliver classes online, introduce new material, offer comments, and administer evaluations online. Learners could also obtain the data they would need for additional research activities.

Digital literacy is a further crucial talent that librarians, students, and their teachers must possess. Digital literacy entails possessing the basic skills to live, learn and work in an environment where communications and other activities are made using digital technologies. This ability enables one to access, manage, integrate, assess, and produce information using digital technology, communication tools, and/or networks. Basically, these skills could include proficiency with MS Word (ability type, format, edit, and manage documents), MS Excel (ability to enter data, plot graphs, and manage spreadsheets), and PowerPoint (ability to develop presentation files), Social Networking Sites (SNSs) (ability to communicate through any of the social media platform including Facebook, Twitter, Wikis, Skype, YouTube etc.), innovative skills (ability produce new knowledge and publish it via graphics, design, images, video, and wiki), as well as proficiency with webinars. Learners would be able to make lecture notes, make charts from any collection of data, and present their project work with these abilities. Similar to that, both synchronous and asynchronous library webinar delivery by librarians would be acceptable.

The media literacy skill emphasizes the significance of the skill sets necessary to enable high-quality teaching and learning. Decoding, evaluating, analysing, and producing print and electronic media, including recording and editing any kind of file, are all included in this. The ability to create and exchange digital content in many formats (such as videos, music, video podcasts, Wiki content, and audio podcasts) would enable learners, teachers, and librarians to keep minimal contact with teachers and students.

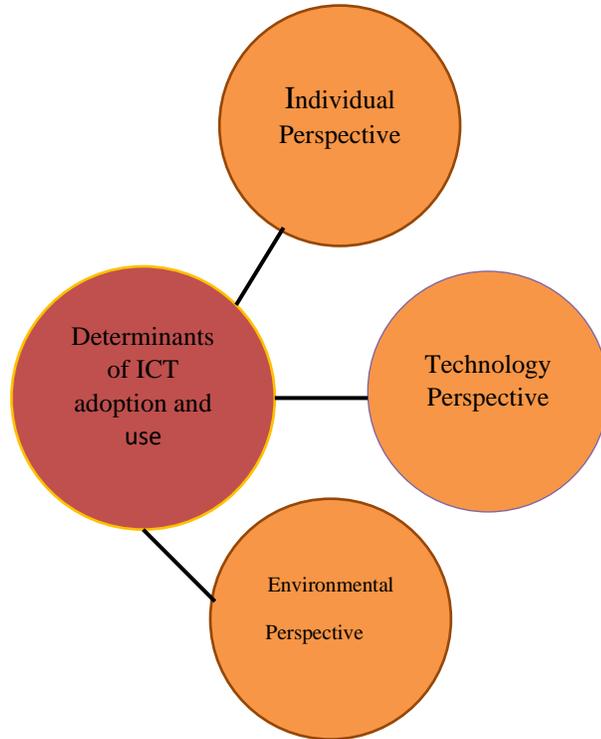


Figure 1: Analytical Framework

4.2. Technology Perspective

The amount of money spent on information and communication technology in schools has dramatically expanded during the past two decades (Pandolfini, 2016; Bremer & Pratt, 2007). The developed world has seen a greater increase in this trend. For instance, educational transformation has occurred in the People's Republic of China, where every student in a primary school now has access to a computer. Johannes et al. (2020) contend that when examining the ICT transformation process in educational systems in Germany and other European nations, the adoption and usage of ICT has progressively expanded in secondary and elementary schools. As a result of this evolution, those schools now use a variety of ICT tools to enhance teaching and learning, including computer technology, online learning software, and communication media. The same condition holds true for online instructions for pupils at their homes and library reference services. The ICT tools that are being used to deliver these services were aptly

highlighted by Moorefield-Lang & Hall (2015). These tools include web 2.0 conferencing tools, screen sharing software, virtual library tours, and screen cast, pathfinder, Wimba Web, Skype Online communication, and meet the librarian web pages.

While these advancements are happening steadily in the industrialized world, there is a lack of digital tools in the majority of developing nation's schools, particularly in the North-West region of Nigeria. For instance, technical assistance, internet-capable gadgets - laptops, desktops, tablets, IPods, etc., and access to the internet (whether through a single computer with a modem or bandwidth) are all woefully inadequate. According to the Federal Ministry of Communication and Digital Economy, Nigeria had a broadband penetration rate of roughly forty percent (40%) as of the month of March 2020, which equates to about eighty million Nigerians having access to high-speed internet in a nation of 200 million people. There are still 31 million people in Nigeria who live in undeveloped or underdeveloped areas. Therefore, significant expenditures in ICT tools are required if schools are to support efficient teaching, learning, and searching for information or knowledge despite security issues.

4.3. Environmental Perspective

Environmental perceptions have received much attention and have been proven to be important factors in ICT adoption and use. Some of the most important ideas when considering the environmental perspective include: policy development and ICT infrastructure. These elements simultaneously limit and open up potential for ICT adoption. From the outlook for policy formulation, many nations have established policies for the adoption, use, and integration of ICT in education. For instance, the Standing Conference of the Ministry of Education and Culture Affairs in Germany has released a strategic paper on "education in the digital world" with the intention of promoting students' digital competencies (Johannes et al., 2020). According to

Kundu & Bej (2020), a number of initiatives have been established in India to support the integration of ICT in school pedagogy, including Education Technology (ET), Computer Literacy and Studies in Schools (CLASS), and the National Policy on ICT in School Education. In Nigeria, a framework for digital literacy is currently being created by the federal government. By 2030, the nation hopes to have 95% of its population digitally literate, according to Mr. Kashifu Inuwa Abdullahi, Director General of the National Information Technology Development Agency (NITDA). In order to provide the agency direction, NITDA has already created a Strategic Roadmap and Action Plan (SRAP), 2021–2024. Over 45,000 teachers have received training on digital literacy and using technology in the classroom at this time nationwide. Additionally included are numerous educational websites and about 15,000 videos. In a similar spirit, the Federal Ministry of Education in Nigeria has created a community for digital literacy through its digital literacy initiative. The program's objectives include educating students, forming alliances, expanding volunteer networks, and designing literacy curriculum for Nigerian secondary schools.

Unquestionably, Nigeria and numerous other nations have made noteworthy efforts to encourage the adoption and use of ICT to support the educational ecosystem. Unfortunately, the digital literacy policy has not been completely integrated with school libraries and librarians. The majority of school libraries and librarians in Nigeria and other developing nations are in this predicament. For instance, Hassan (2019) observed that the Bangladeshi education system recognizes school libraries as being less important than other goals since they are not connected with the teaching and learning process. Similarly, Mojapelo (2018) claims that the majority of African nations with emerging economies lack legislative school library policies that would enable them to implement active and long-lasting libraries and information services to raise the

quality of education. In order to improve instruction, learning, and information service delivery in an unsafe school setting, a digital literacy policy must be developed. Without taking into account everything that supports and functions as a school, this policy may not be very helpful. The librarians and school libraries are crucial participants in this initiative and ought to be included.

ICT infrastructure refers to the quantity of IT resources in an organization or a nation. They are essential to an organization's ability to innovate. This framework outlines several digital infrastructures, such as internet connectivity, desktop, laptop, and smart phone use, that will support learning in an unsafe setting. The adoption and usage of these digital tools will enhance online homeschooling, remote learning, e-learning, blended learning, and virtual library services. These digital infrastructures can be used by instructors, librarians, and students to convey information and provide remote access to information sources. In a number of studies, the requirement for ICT infrastructure in schools and school libraries has been recognised (Shonhe, 2019 Omidinia, Masrom, and Selamat, 2011). It is apparent that activity in this area is necessary given the relevance of ICT infrastructures and their impact on the educational system.

5. Conclusion

The study attempts to comprehend the factors that influence ICT adoption in high-quality teaching learning in an unstable environment. The study concentrates on individual, technological, and environmental viewpoints. The difficulties brought by insecurity are a topic that will continue to spark intellectual discussion among different education stakeholders, much like abduction and kidnapping and kidnapping for ransom continue to have an impact on regular school life. Teachers and librarians now need to become used to teaching and providing library services online because of the extraordinary security problem.

The study's proposed analytical approach will aid in efforts to continue discovering and implementing safe learning methods in educational settings. All contexts, including communication, the manufacturing of products and services, healthcare, marketing, and education, rely heavily on digital technology. Digital tools are employed in the educational setting to support teaching and learning. Thus, implementing strategies and regulations for the adoption and use of digital technology will have a big impact on teaching and learning while there is instability.

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