Tertiary Institutions and Lifelong Learning via Digital Tools in Nigeria: A Review

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Abstract
Background: Tertiary institutions play a critical role in promoting lifelong learning through the adoption of digital tools. These institutions employ online platforms, interactive resources, and virtual tools to empower students beyond traditional education, fostering continuous skill development and adaptability to the digital age.
Objective: This study examined the intersection of tertiary institutions' role in enhancing lifelong learning through digital tools.
Methodology: A scoping review, conducted following Arksey & O'Malley's (2005) methodology, systematically analyzed studies from 2015 to 2023 to achieve the research aim.
Results: The study revealed that tertiary institutions can leverage Learning Management Systems (LMS), video conferencing platforms like Zoom and Google Teams for virtual classes, online libraries for research, and collaborative tools like Google Workspace and Teams to cultivate continuous education beyond traditional boundaries. Furthermore, tertiary institutions promote lifelong learning by providing access to resources, fostering critical thinking, and offering diverse courses. They also nurture an environment of intellectual curiosity and equip students with the knowledge and skills necessary for lifelong career and personal growth.
Conclusions: The study concluded that tertiary institutions enhance lifelong learning through digital tools by providing accessible online courses, interactive platforms, and virtual resources. These tools can facilitate flexible learning, enabling individuals to acquire new skills at their own pace. The integration of technology in education would promote continuous knowledge acquisition, fostering adaptability in an evolving global landscape.
Keywords: Tertiary institutions, lifelong learning, digital tools, traditional education, digital age.

1.0   Introduction

In the ever-changing landscape of the 21st century, lifelong learning has emerged as a critical concept for individuals to thrive and adapt to the demands of the modern world. Lifelong learning is the ongoing process of acquiring new knowledge, skills, and understanding throughout one's life, enabling continuous personal and professional growth (Reychav, 2023). The rapid advancements in technology, globalization, and the changing nature of work have made lifelong learning more essential than ever before. As jobs become increasingly automated and require specialized skills, individuals must continuously update their knowledge and skill sets to remain competitive in the labour market. Lifelong learning also plays a crucial role in personal fulfilment and well-being. Engaging in lifelong learning allows individuals to explore new interests, expand their horizons, and enhance their cognitive abilities, contributing to a more enriching and meaningful life.

Lifelong learning has emerged as a critical factor in Nigeria's pursuit of rapid development and a knowledge-based economy. As the country strives to diversify its economy and enhance its competitiveness globally, equipping its citizens with the skills and knowledge necessary to adapt to the evolving demands of the 21st century is paramount. Lifelong learning benefits individuals and contributes to Nigeria's economic growth. By fostering a skilled and adaptable workforce, lifelong learning enhances productivity, innovation, and entrepreneurship, driving economic expansion (Erim et al., 2021). Moreover, lifelong learning promotes social inclusion and reduces poverty by enabling individuals to acquire the skills necessary to secure employment and improve their livelihoods (Eze et al., 2020).

Despite the recognized importance of lifelong learning, its implementation in Nigeria faces several challenges. Limited access to education, particularly in rural areas, hinders individuals from pursuing continuous learning opportunities. According to United Nations Educational, Scientific and Cultural Organization's 2022 Global Education Monitoring Report, the net enrollment rate in secondary education is only 42.7%, and the adult literacy rate is 62.1% (UNESCO, 2022). These low rates hinder individuals from pursuing further education and engaging in lifelong learning activities. Financial constraints pose another significant barrier, as many Nigerians struggle to afford the costs associated with further education (Olanrewaju, 2020). Societal attitudes also play a role, with traditional beliefs sometimes discouraging individuals from pursuing education beyond the formal schooling system. These challenges highlight the need for comprehensive strategies addressing structural and attitudinal barriers to promote lifelong learning in Nigeria (Gamage et al., 2021).

Tertiary institutions, encompassing universities, colleges, and technical institutes, have traditionally played a pivotal role in imparting formal education and equipping students with the necessary skills and knowledge for successful workforce participation. This role has been characterized by providing structured academic programs, specialized instruction by qualified faculty, and cultivating critical thinking and problem-solving abilities (Chigbu & Nekhwevha, 2022). A fundamental aspect of this traditional role lies in preparing graduates for the demands of the workforce. Tertiary institutions have historically tailored their curricula to align with industry needs, ensuring graduates possess the relevant skills and competencies employers seek (Mainga et al., 2022; Poláková et al., 2023).

In addition to technical skills, tertiary institutions have also emphasized the development of transferable skills, such as communication, teamwork, and adaptability, which are crucial for success in a rapidly evolving job market (Poláková et al., 2023). Chan (2016) stated that the benefits of tertiary education extend beyond the acquisition of specific skills and knowledge. Tertiary education enhances individuals' self-efficacy, motivation, and learning ability, essential for lifelong learning. Tertiary institutions also play a role in promoting lifelong learning by collaborating with industry and community partners. These partnerships create opportunities for students to apply their knowledge and skills in real-world settings, bridging the gap between academia and the practical world (Huong, 2023).

Despite its merits, traditional education faces limitations that necessitate introducing digital tools for lifelong education. These limitations include rigidity, limited accessibility, and an inability to adapt to the ever-evolving

demands of the digital age. The rigidity of traditional education, with its fixed schedules, classroom-based instruction, and standardized curriculum, often fails to cater to students' diverse learning styles and needs (Alt & Raichel, 2020). This can hinder effective learning and discourage students from pursuing lifelong learning opportunities. Traditional education is also constrained by limited accessibility, particularly for individuals residing in remote areas or those with busy schedules (Haleem et al., 2021). The reliance on physical classrooms and fixed timetables excludes those who cannot easily attend traditional classes. Furthermore, traditional education often struggles to keep pace with the rapid advancements in technology and the ever-changing demands of the workplace. The fixed curriculum and lack of flexibility make incorporating new skills and knowledge into traditional education models difficult. To address these limitations, digital tools offer a promising solution for lifelong education. (Serdyukov, 2017).

The rapid advancement of technology has revolutionized the educational landscape, opening up many opportunities for lifelong learning. Digital tools have emerged as powerful enablers of continuous education, offering individuals the flexibility and accessibility to pursue knowledge and skills throughout their lives (Keengwe & Bhargava 2014). One of the most significant contributions of digital tools to lifelong learning is their ability to break down geographical and temporal barriers. Online platforms and virtual learning environments provide learners access to various educational resources, regardless of location or time constraints. This flexibility allows individuals to fit learning into their busy schedules, fostering a culture of continuous upskilling and reskilling (Camilleri & Camilleri, 2017; Adepoju & Esan, 2023). Digital tools also enhance lifelong learning by providing interactive and personalized learning experiences. Adaptive learning technologies cater to individual learning styles and pace, adjusting content and activities to match each learner's needs (Hassan, 2021). This personalized approach promotes more profound understanding and engagement, fostering a more effective learning process. Furthermore, digital tools facilitate collaboration and knowledge sharing among learners, creating a vibrant learning community beyond traditional classroom walls. Online forums, discussion boards, and social media platforms allow learners to connect, share ideas, and engage in peer-to-peer learning, fostering community and support (Adepoju & Esan, 2023).

The significance of digital tools in the lifelong learning process can be underpinned in the theory of connectivism (Corbett & Spinello, 2019). Tertiary institutions function as centers, facilitating the exchange of ideas and resources among scholars, students, and others. Lifelong learning is facilitated in digital environments beyond the confines of the traditional classroom through collaborative platforms and online courses. The role of digital technology in education in Nigeria is highlighted by Eli-Chukwu et al (2020), who revealed that tertiary institutions can enhance accessibility and foster a culture of lifelong learning. Through digital tools, tertiary institutions can enable collaboration and information sharing by establishing a networked learning environment.

A growing body of research has examined the role of digital tools in promoting lifelong learning, highlighting their potential to enhance accessibility, flexibility, and engagement in education Oyedokun & Adeolu-Akande (2022) revealed that digital devices and mobile learning can improve accessibility, flexibility, and personalization, empowering individuals to pursue lifelong learning. Similarly, Haleem (2022) found that digital tools foster collaborative learning environments, enabling individuals to connect with peers and experts, fostering community and promoting knowledge sharing. Moreover, a study by Tong et al. (2022) demonstrated the effectiveness of digital tools in promoting self-directed learning, allowing individuals to take control of their learning journey and pursue their interests at their own pace. Similarly, Uko & Nnaji (2016) found that tertiary institutions can promote lifelong learning by providing career counselling services, offering lifelong learning programs, and encouraging students to engage in self-directed learning. Mundhe (2022) found that tertiary institutions can promote lifelong learning by developing partnerships with industry, offering internships and apprenticeships, and encouraging students to participate in lifelong learning activities. There has, however, been a dearth of studies examining how tertiary institutions adopt digital tools to enhance lifelong learning. Hence, this study shall examine the role of tertiary institutions in enhancing lifelong learning among students in the tertiary institution annexing digital tools in Nigeria. The specific objectives include to:

i.   assess how digital tools can enhance lifelong learning

ii.   examine the digital tools that can be used in tertiary institutions to stimulate lifelong learning in Nigeria

iii. examine how tertiary institutions can utilize digital tools to enhance lifelong learning among students

2.0   Methodology

Scoping review methodology, as presented by (Arksey & O'Malley, 2005), was employed for this study. This study's methodology was in accordance with the recommendations made by (Arksey & O'Malley, 2005). There are six steps involved in a scoping review methodical framework (Arksey & O'Malley, 2005), which include identification of the research question, identification of relevant studies, study selection, charting the data, collation; summary and reporting of results and the sixth the consultation exercise.

2.1   Research Question

The primary objective of this scoping review was to explore the central research question: "What are the roles of tertiary institutions in enhancing lifelong learning via digital tools in Nigeria? " The primary research question directly pertained to the scoping review's underlying focus, and all the studies in this review addressed this fundamental research question (Arksey & O'Malley, 2005). All studies that met all inclusion criteria were further assessed for evidence related to the study objective.

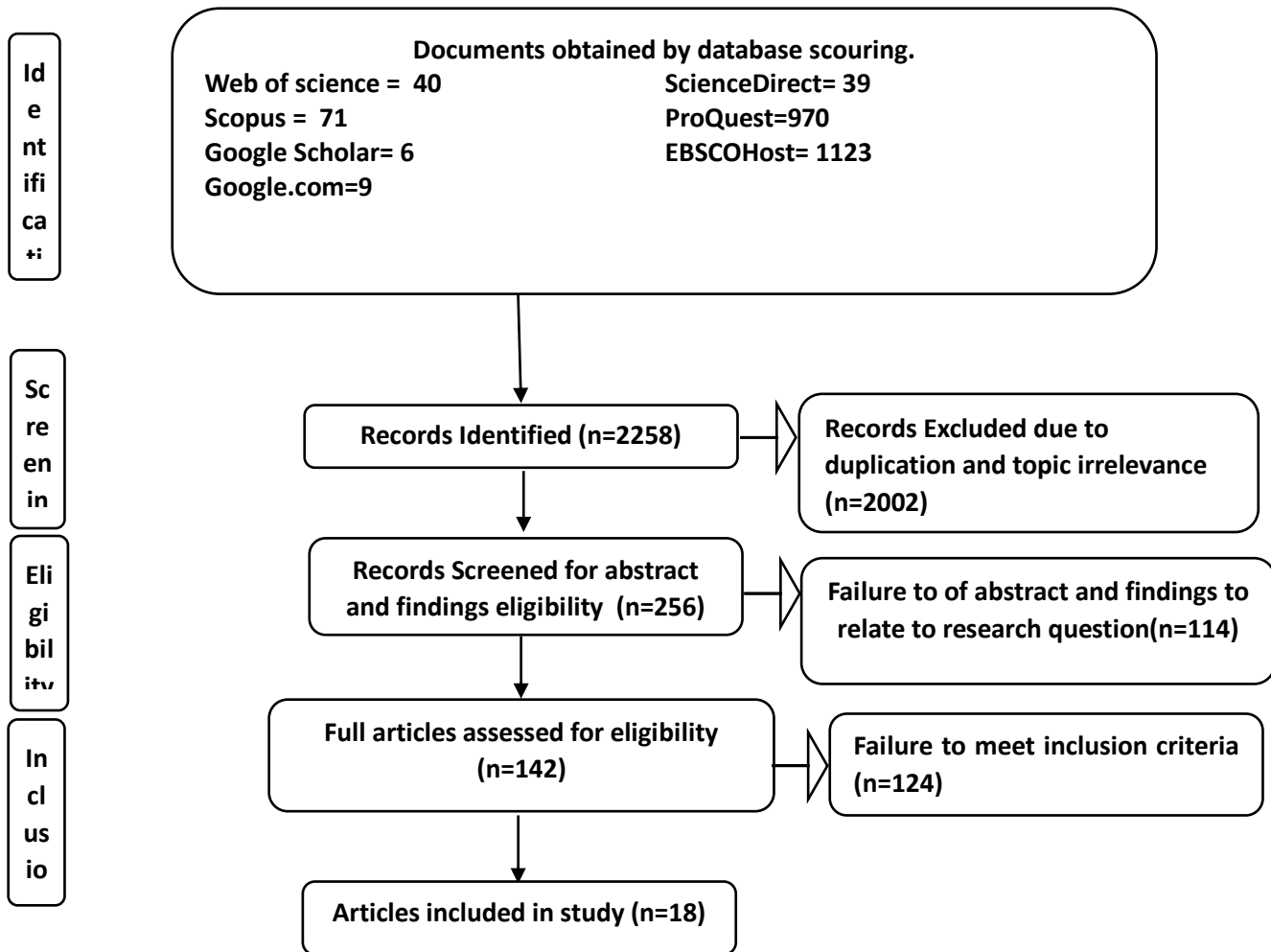## 2.2   Identification of Relevant Studies

A comprehensive search of multiple databases was used to identify relevant studies, including Scopus, ProQuest, EBSCOHost, Science Direct, and Web of Science. Following guidance from Arksey and O'Malley (2005), key publications and reference lists of included articles were hand-searched to identify additional relevant articles and potentially relevant recognized sources were assessed for inclusion. The search was conducted in November 2023, using two broad areas: the role of tertiary institutions in enhancing lifelong learning and the role of digital tools in promoting lifelong learning in Nigeria. Search terms were developed for each area and ran separately using the Boolean phrase. The initial search produced a total of 2258 articles. Duplicate and irrelevant articles by titles were removed to have an initial search outcome of 256 articles.

2.3   Study Selection

Articles were reviewed for relevance based on predetermined inclusion and exclusion criteria. The criteria were based on the applicability of the research questions. The study included peer-reviewed research articles, conference papers, reports, and grey literature published in English that directly addressed the roles of tertiary institutions in enhancing lifelong learning via digital tools in Nigeria. The Inclusion criteria for articles are (1) peer-reviewed research articles, conference papers, reports, and grey literature published in English. (2) studies conducted in Nigeria. (3) studies published from 2015 to 2023. (4) quantitative, qualitative, literature reviews and mixed-methods studies. (5) Studies focusing on tertiary institutions.

The title, abstract and findings of 256 articles were reviewed for inclusion, among which 114 were excluded for failure to meet inclusion criteria. The full text of the remaining 142 articles was carefully examined for eligibility to produce an outcome of 18 studies included in this scoping review.

Figure 1: Visual presentation of the article selection process.

Documents obtained by database scouring.

Web of science = 40	**ScienceDirect= 39**
Scopus = 71	**ProQuest=970**
Google Scholar= 6	**EBSCOHost= 1123**
Google.com=9	

Identificati

Screenin

Eligibility

Inclusio

Records Identified (n=2258) → **Records Excluded due to duplication and topic irrelevance (n=2002)**

Records Screened for abstract and findings eligibility (n=256) → **Failure to of abstract and findings to relate to research question(n=114)**

Full articles assessed for eligibility (n=142) → **Failure to meet inclusion criteria (n=124)**

Articles included in study (n=18)

3.0   Results and Discussion

3.1   The role of digital tools in enhancing lifelong learning among students in the tertiary institutions

Digital tools have emerged as potent facilitators of lifelong learning, offering individuals unparalleled opportunities for information access, collaborative engagement, and individualized learning experiences. Digital tools can eliminate geographical constraints, granting students access to an extensive array of educational materials irrespective of their locations. Learning has been democratized and made available worldwide through online courses, webinars, and educational platforms (Haleem et al., 2022; Di Giacomo et al., 2018; Frank et al., 2023; Garzón Artacho et al., 2019; Imoke et al., 2021) . For instance, websites like Coursera and edX provide courses from prestigious universities worldwide, enabling students to customize their education to fit their interests and professional objectives. Furthermore, digital tools offer temporal and pacing flexibility. Students can accomplish their educational goals while managing other obligations by having access to materials at their own pace. Many online courses are designed to accommodate diverse schedules and foster a culture of lifelong learning that respects the unique requirements of each student (Timotheou et al., 2023; Garzón Artacho et al., 2019).

Collaboration in learning is another benefit of digital tools, as they eliminate the social isolation frequently present in conventional educational settings. Collaborative platforms such as online forums and discussion boards facilitate the connection, exchange of perspectives, and active participation in substantive dialogues

among learners and experts on a global scale. This collaborative element enriches the educational journey by facilitating the exchange of ideas and cultivating a feeling of camaraderie (Fischer et al., 2023; Curran et al., 2019). Social media platforms serve as additional facilitators of networking and knowledge exchange. Platforms such as LinkedIn facilitate Professional networking and knowledge-sharing, which foster an environment of lifelong learning that extends beyond the confines of formal education. By participating actively in online communities, students can establish a network of professionals and experts and remain current on industry trends (Şen & Yildiz, 2022). Digital tools foster instantaneous engagements, deliberations, and collaborative undertakings, thereby establishing an animated and progressive educational community that transcends the confines of the conventional classroom. Skill development and lifelong learning are inextricably linked, and digital tools are instrumental. Individuals can acquire and refine practical skills through simulation tools, online courses, and virtual workshops. Providing a secure and engaging setting enables individuals to develop and hone their abilities, guaranteeing ongoing professional growth throughout their professional trajectories (Marcia et al., 2023).

3.2 Digital tools in tertiary institutions for stimulating lifelong learning in Nigeria.

The concept of lifelong learning has become increasingly significant in the dynamic realm of education, playing a pivotal role in the progress of both individuals and societies. Lifelong learning transcends the conventional confines of formal education and permeates an individual's existence, cultivating continual personal and professional growth. There is a growing recognition among tertiary institutions in Nigeria of the significance of incorporating digital tools to foster and promote lifelong learning among faculty and students. Digital tools that can facilitate lifelong learning include online learning platforms. Educational systems have been profoundly transformed globally with the introduction of online learning platforms. Tertiary institutions in Nigeria can utilize platforms such as Coursera, edX, Khan Academy, FutureLearn, and Linkedin Learning to offer various courses in diverse disciplines. These resources can serve as supplementary learning tools for students, allowing them to delve into subjects beyond their traditional curriculum. Moreover, these platforms enable institutions to collaborate to provide Massive Open Online Courses (MOOCs), thereby augmenting the accessibility of high-quality education (Haleem et al., 2022; Eze et al., 2018, Imoke et al., 2021).

Learning management systems (LMSs), including Moodle and Blackboard, also function as all-encompassing platforms that facilitate the administration and distribution of academic materials. These systems facilitate the creation of virtual classrooms, resource-sharing, and collaborative learning among institutions. A study by Eze et al. (2020) indicates that LMS fosters an environment favourable for lifelong learning by improving communication and interaction. By utilizing LMS, tertiary institutions in Nigeria can foster collaboration and guarantee that learning continues outside the conventional classroom environment. Social media platforms, including but not limited to Facebook, WhatsApp, Twitter, and LinkedIn, function as potent instruments that facilitate collaborative learning and professional networking. Academics can establish virtual communities where faculty and students collaborate on projects, exchange pertinent materials, and engage in discussions. Furthermore, these platforms provide avenues for ongoing professional growth as tutors disseminate real-time insights and updates (Abdulrahaman et al., 2020; Jumare & Sulaiman, 2022).

In addition, video conferencing platforms such as Google Teams and Zoom have the potential to revolutionize traditional education in Nigeria, where smartphones are ubiquitous. These platforms facilitate instantaneous interaction between educators and students. Online libraries can also facilitate research by providing students with access to a wealth of digital resources. Collaborative tools like Google Workspace and Teams enable ongoing education by challenging conventional limitations and encouraging uninterrupted collaboration on documents and projects. These digital technologies will serve as a supplementary tool to traditional education while fostering a culture of lifelong learning. They will facilitate global connectivity among individuals and surpass geographical constraints, thereby ensuring a lifelong educational experience that is both inclusive and dynamic (Garzón Artacho et al., 2020; Haleem et al., 2022; 39. Tulinayo et al., 2018).

3.3   The role of tertiary institutions in the utilization of digital tools to enhance lifelong learning among students.

Tertiary institutions have a significant impact on the academic and professional development of individuals. These institutions are progressively acknowledged as vital centres for promoting continuous learning, in addition to their conventional emphasis on degrees. An imperative approach to fostering lifelong learning involves seamlessly incorporating technology into the pedagogical and teaching procedures. Institutions should allocate resources towards implementing cutting-edge technologies, including MOOCs, virtual reality, online simulations, and interactive learning platforms. By promoting active learning and equipping students with the digital competencies demanded in the contemporary labour market, these instruments will serve to facilitate lifelong learning (Haleem et al., 2022; Tulinayo et al., 2018; Huong & Maryam, 2023). Nigerian tertiary institutions can also adopt online learning systems, offering students convenient access to educational resources. Platforms like Coursera, edX, and Khan Academy provide a wide range of courses, allowing students to gain additional skills and information beyond what is taught in their conventional curriculum.   Institutions can collaborate with these platforms or create their own to enhance traditional classroom learning (Kaputa et al., 2022; Alenezi, 2022).

Tertiary schools should incorporate virtual classrooms and webinars into the curriculum to enable immediate interaction between students and educators, overcoming geographical limitations and promoting ongoing involvement.   Platforms such as Zoom and Microsoft Teams have become indispensable for remote education, facilitating the delivery of lectures, workshops, and conversations while promoting camaraderie among students.   Tertiary institutions can utilize digital solutions such as Google Workspace and Microsoft 365 to foster collaborative learning, enhance teamwork, and facilitate student communication by creating shared documents, presentations, and projects. This collaborative approach aligns with the requirements of contemporary business, where proficient teamwork and communication abilities are essential (Eze et al., 2018, Imoke et al., 2021).

Developing mobile learning applications in Nigeria can improve accessibility due to the extensive utilization of cell phones.   Institutions can develop applications that offer convenient access to course materials, quizzes, and interactive content while on the move.   This strategy caters to the mobile-focused lifestyle of numerous pupils, enhancing the probability of regular contact with educational resources.   Tertiary institutions should give high priority to providing digital literacy training for both students and educators (Frank et al., 2023; Eze et al., 2018).   Incorporating digital literacy classes and professional courses into the curriculum can equip students with the necessary abilities to navigate online platforms and promote ongoing learning.   This equips them for a future highly influenced by technology and enriches their lifelong educational journey.

4.0   Conclusions, Policy Implications and Contribution to Knowledge

4.1   Conclusion

Incorporating digital tools has surfaced as a potent catalyst in encouraging students to engage in lifelong learning. These tools have the capacity to surpass geographical limitations, promote educational equity, and offer adaptable learning opportunities. Courses such as those provided by Coursera, edX, and Khan Academy enable students to customize their academic pursuits in accordance with their personal inclinations and career objectives. Collaborative technologies, such as video conferencing and social media platforms, eliminate social isolation and promote global connectivity, enhancing lifelong learning. Furthermore, tertiary institutions play a crucial role in implementing digital tools, necessitating the smooth incorporation of technologies such as massive open online courses (MOOCs), virtual reality, and online simulations to foster active learning and furnish students with digital proficiencies. In an ever-changing educational environment, tertiary institutions must employ digital tools strategically to ensure that students are adequately equipped for a future in which lifelong education is fundamental to their personal and professional development.

4.2   Recommendations

The research findings on the role of digital tools in enhancing lifelong learning among students have significant policy implications for tertiary institutions in Nigeria.

1. Policymakers in Nigerian tertiary institutions should prioritize integrating digital tools into the curriculum. The findings emphasize the importance of online learning platforms such as Coursera, edX, and Khan Academy, indicating that these platforms offer diverse courses that can supplement traditional education. Institutions should explore collaborations with these platforms or consider developing their own to expand the accessibility of high-quality education. Allocating resources to implement learning management systems (LMSs) like Moodle and Blackboard can further enhance communication, collaboration, and the distribution of academic materials. Institutions should also engage in the formulation of strategies to incorporate technology into the educational domain seamlessly.

2. The study also highlights the significance of social media platforms in fostering collaborative learning and professional networking. Policymakers should recognize the potential of platforms like Facebook, WhatsApp, Twitter, and LinkedIn in creating virtual communities where faculty and students can engage in discussions, collaborate on projects, and exchange knowledge. Integrating these platforms into the educational ecosystem can create a more dynamic and interactive learning environment.

3. Furthermore, the research underscores the importance of video conferencing platforms like Google Teams and Zoom, especially in Nigeria, where smartphones are prevalent. Policymakers should consider incorporating virtual classrooms and webinars into the curriculum to overcome geographical limitations and promote real-time interaction between students and educators. Additionally, the development of mobile learning applications is suggested to improve accessibility, aligning with the mobile-focused lifestyle of many students in Nigeria.

4.3   Contribution to Knowledge

The study provides a comprehensive overview of platforms and technologies, such as MOOCs, LMSs, social media, video conferencing, and mobile applications. It offers a practical guide for institutions seeking to enhance their educational practices. It bridges the gap between theoretical discussions on lifelong learning and actionable strategies by pinpointing tools to implement in the Nigerian context.

Moreover, the research emphasizes the role of institutions in fostering a culture of ongoing learning through digital literacy training. Policymakers should prioritize including digital literacy classes and professional courses in the curriculum to equip students and educators with the necessary skills to navigate online platforms effectively. This forward-looking approach prepares students for a future dominated by technology and ensures they derive maximum benefit from the digital tools available.

Glossary of Abbreviations

LMSs Learning management systems.

MOOCs Massive Open Online Courses.

UNESCO United Nations Educational, Scientific and Cultural Organization.

Declarations

Availability of data and materials

All research materials used have been referenced in the study.

Competing interests

The authors declare that they have no known competing interest that could have appeared to influence the work reported in this article.

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Authors' contributions

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