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# Digital library service systems for Nigerian university students

Robert Akinade Awoyemi, *PhD*[1], Titilayo Oluwapelumi Akinwamide[2] and Juwayriyyah Adejoke Qamaruddeen[3]
University Library, Federal University of Technology, Akure, Nigeria

## Abstract
Due to inadequate physical library facilities, out-of-date materials, and restricted funding, Nigerian university students have substantial challenges in accessing academic resources. As a result, the emergence of mobile digital libraries offers a revolutionary answer by facilitating easy, mobile access to information. Based on this, the development of a comprehensive digital library service system for Nigerian university students is examined in this research, along with its advantages, difficulties, and current models for evaluation. It concluded that mobile digital libraries greatly improve university students' academic achievement, research output, and access to knowledge. However, strategic investments, stakeholder cooperation, and a strong technology infrastructure are necessary for their effective implementation. The study offers seven doable suggestions for enhancing mobile library services in Nigeria: (1) bolstering digital infrastructure; (2) offering students subsidised data plans; (3) improving digital literacy programs; (4) creating locally hosted cloud-based library services; (5) encouraging open educational resources; (6) boosting funding for hybrid digital libraries; and (7) putting in place user-cantered feedback systems. The study comes to the conclusion that although mobile digital libraries have enormous potential to increase academic engagement and close the knowledge gap, their efficacy depends on focused policy initiatives, ongoing funding, and technology improvements. In summary, through improved knowledge accessibility, a well-integrated digital library service system will empower Nigerian students, encourage inclusive education, and propel national progress.

**Keywords:** Academic library, digital library, digital technology, mobile technology, mobile library services, Nigerian university students.

## Introduction
In the current digital era, mobile technology has become a revolutionary instrument for information access. Mobile technology has significantly increased access to knowledge in the field of higher education, making it a key factor in academic achievement, innovation, and societal advancement (Agbo, 2021). A number of academics have recently highlighted the enormous potential of mobile technology in providing digital library services, which would close knowledge gaps and give students direct access to learning materials no matter where they are (Alguliyev & Ismayilova 2017; Wang, 2018; Okeji, et al., 2020; Awoyemi & Awoyemi 2021; Fernández-Molina et al., 2022).However, from these bodies of literature, it was deduced that while developed countries have long integrated advanced digital library services into their academic systems, Nigerian universities face unique challenges that hinder the full adoption of mobile digital libraries (Agbo, 2021; Ogunniyi et al., 2024).

Inadequate finance, shortcomings in policy implementation, poor digital literacy, and deficiencies in infrastructure have all been identified as challenges (Mohammed, 2013). Academic libraries have had constant advancements in terms of easy access to academic resources since the early 1980s, when a number of digital technologies first emerged (Unegbu et al., 2023). Academic libraries are now facilitating stress-free information retrieval for both students and researchers through the use of digital technology and mobile library service systems (Olubiyo & Olubiyo, 2023). In order to guarantee that users may easily access academic materials on their smartphones and other devices, the digital academic library's

mobile services go one step further by providing ease and flexibility-enabled mobile devices, even in remote areas(Anusha et al., 2020).

Developed nations have made substantial use of mobile technology, especially through sophisticated digital library systems, to offer more seamless and effective educational experiences. To enhance information accessibility, data management, and security in academic settings, digital library infrastructures in nations like the US, UK, and Canada are progressively integrating cutting-edge technologies like blockchain, cloud computing, and artificial intelligence (Wang, 2018). The increase of remote access to academic resources and the modernisation of library services have both benefited greatly from these advancements.

On the other hand, many higher education institutions in Nigeria are currently working to create reliable and completely functional digital library systems, therefore the country's digital library development is still comparatively underdeveloped (Obuezie et al., 2022). Progress in this field is nevertheless hampered by issues such insufficient digital repositories, poor internet access, erratic power supplies, and the restricted digitisation of academic papers (Obuezie et al., 2022). Notwithstanding these drawbacks, recent research has highlighted the need of enhancing mobile-based access to academic knowledge in Nigeria, especially in academic settings where the need for adaptable learning resources is still growing (Ntogo-Saghanen & Echedom, 2023).

The lack of clear national policies on digital education and technology integration is one of the main causes of the sluggish development of digital academic libraries in Nigerian universities (Odu & Omosigho, 2017). The use of mobile digital library systems has become less coordinated and efficient across institutions as a result of this policy gap. In light of this, the current study uses a literature review methodology to investigate the transformational potential of mobile digital libraries in enhancing knowledge access. The following goals serve as the study's compass in order to accomplish this goal:

1. To examine the current state of digital library services in Nigerian universities;
2. To evaluate the benefits and challenges associated with mobile access to digital libraries.

**Approach adopted**

This paper uses secondary sources of data to implement a qualitative research strategy. In keeping with this strategy, the paper mainly uses a literature review method to analyse and compile academic materials pertinent to the topic of mobile digital libraries and knowledge access in Nigerian institutions. The literature review method offers a chance to critically assess previous research, theoretical debates, and empirical results related to the study issue.

A literature review, according to Anusha et al. (2020), entails the methodical identification, analysis, and synthesis of academic works pertaining to a specific subject of research. In a similar vein, Abdulahi and Aliyu (2019) clarify that the methodology allows researchers to evaluate and analyse current scholarly materials, such as journal articles, textbooks, conference papers, and institutional reports, in order to develop a trustworthy evidence-based basis for research. Based on these viewpoints, this study examined pertinent research on mobile technology, digital libraries, and academic resource access in higher education.

Secondary data adoption was deemed appropriate since it enables more extensive interaction with previously established scholarly arguments and findings in many contexts. By using this method, the study is

possible to pinpoint gaps, new trends, and persistent issues related to the creation and use of digital libraries in Nigerian academic institutions.

**Overview of digital libraries and their importance in higher education**

Because they make it easier to access enormous collections of scholarly and research resources, digital libraries are becoming more and more important parts of contemporary higher education. Digital libraries give consumers quicker and more flexible access to knowledge via electronic platforms, in contrast to traditional libraries that mostly rely on physical resources and constrained storage space. Digital libraries, according to Alguliyev and Ismayilova (2017), enhance information retrieval procedures and assist organisations in overcoming many of the drawbacks of conventional library systems. Consequently, academic materials can be accessed remotely by students, researchers, and lecturers via computers, tablets, and mobile devices.

The idea of digital libraries has been tackled from a variety of angles by different academics. According to Wang (2018), a digital library is a systematically arranged collection of digital resources and associated services that are accessible electronically from various locations. According to Abankwa and Run (2019), digital libraries can be defined more simply as library systems that offer electronic access to content like e-books, scholarly journals, theses, research reports, and multimedia resources, hence encouraging flexibility in learning and research activities.

Globally, digital libraries have become increasingly significant within academic environments. Fernández-Molina et al. (2022) note that initiatives such as the Library of Congress Digital Collections and the European Digital Library have demonstrated the effectiveness of digital platforms in preserving, organizing, and disseminating knowledge across diverse audiences (Ogunniyi et al., 2024).

While Nigeria has adopted digital library innovations more slowly than many industrialised countries, efforts to incorporate digital library services into academic institutions are progressively being undertaken at a number of universities. Agbo (2021), for example, emphasises how the National Open University of Nigeria uses its electronic library platform to give students access to academic publications. However, in many Nigerian higher education institutions, the full realisation of digital library services is still hampered by a lack of infrastructure, insufficient finance, and technological constraints (Awoyemi & Awoyemi, 2020; Agbo, 2021).

In a same vein, Ahmadu Bello University has embraced digital innovation by creating a digital repository that has greatly increased the institution's access to scholarly and research materials (Unegbu et al., 2023). Similarly, the Federal University of Technology Akure runs a digital library system that facilitates staff and student research, teaching, and learning (Olubiyo & Olubiyo, 2023). The Albert Ilemobade Library serves as the institution's main academic library and offers digital platforms for users to access electronic books, journals, theses, dissertations, and multimedia resources (Awoyemi & Awoyemi, 2021).

These resources can be accessed remotely, thereby enabling users to continue research and learning activities beyond the physical library environment. Beyond the central repository, some faculties and schools within the university have also developed specialized electronic library platforms tailored to their academic disciplines. For example, the School of Computing maintains an e-library that provides access to digital books, archived projects, and other relevant computing materials.

The growing integration of digital libraries into higher education reflects their broad significance for learning, research, and academic collaboration (Abdulahi & Aliyu, 2019). One of the most widely acknowledged benefits of digital libraries is the increased accessibility and convenience they provide to users. Chiware (2020) observes that digital libraries allow students and academic staff to access scholarly resources without the limitations of geographical location or time.

This position is reinforced by Obuezie et al. (2022), who note that digital platforms create uninterrupted access to academic materials, thereby supporting continuous learning. Unegbu et al. (2023) further argue that unlike conventional libraries that operate within fixed hours, digital libraries remain accessible round the clock, making research materials available whenever they are needed. A practical example is the digital repository of the University of Ibadan, which has reportedly improved students' access to scholarly resources and reduced dependence on outdated physical materials (Sahabi & Otobo, 2021).

The capacity of digital libraries to promote multidisciplinary interaction and research cooperation is another significant addition. They promote knowledge sharing and enable multiple users to retrieve and exchange information at the same time by giving access to a wealth of digital resources (Ntogo-Saghanen & Echedom, 2023). Because they facilitate the efficient access and dissemination of scientific knowledge, platforms like JSTOR and ScienceDirect have become essential to academic research in many developed nations (Omeluzor et al., 2022). However, issues like insufficient funding, erratic internet access, and poor infrastructure continue to limit the efficacy of digital libraries in Nigeria (Aboagye et al., 2020).

From an economic standpoint, digital libraries have also been considered cost-effective alternatives to conventional library systems. Okeji et al. (2020) explain that digital repositories help institutions optimize available resources while reducing operational pressures associated with physical libraries. Obuezie et al. (2022) further argue that maintaining traditional libraries often requires substantial investment in physical infrastructure, staffing, and continuous acquisition of printed texts, whereas digital libraries reduce dependence on hardcopy materials and increase the quantity of resources that can be made available to users electronically. Supporting this view, Adogbeji and Akporhonor (2021) note that digital systems expand access to academic materials while minimizing some of the recurring costs associated with physical collections. Niqresh (2019) additionally reports that universities utilizing digital repositories may reduce operational library costs by approximately 40 percent.

Additionally, digital libraries play a major role in closing knowledge gaps, especially in underdeveloped nations where access to global academic resources may be restricted. Their capacity to link academics with worldwide research results enhances academic visibility and participation. For instance, the Covenant University Repository has improved researchers' and students' access to foreign scholarly publications, allowing for increased involvement in international academic discourse (Chukwu et al., 2018).

**Current state of digital library service systems in Nigerian universities**

In recent years, universities in Nigeria have increasingly acknowledged the importance of digital library systems in supporting teaching, learning, research, and knowledge dissemination within higher education institutions (Agbo, 2021). Although

awareness and adoption have improved considerably, the level of development and implementation of digital library services still differs widely across universities. Several institutions continue to face infrastructural, financial, and administrative challenges that limit the effectiveness and sustainability of these systems (Ogunniyi et al., 2024).

The growth of digital libraries in Nigerian institutions is mostly due to technological advancements and the increasing need for easier access to academic resources (Anusha et al., 2020). Universities including the University of Ibadan, Ahmadu Bello University, and the Federal University of Technology Akure have created digital repositories that provide access to electronic books, theses, dissertations, and scholarly publications (Unegbu et al., 2023). Despite these developments, colleges' digital library services vary widely in terms of efficacy, accessibility, and quality. Many universities still utilise outdated technology and poorly maintained digital infrastructures, which negatively affects service delivery and user experience.

One of the most persistent obstacles confronting digital library systems in Nigeria is inadequate technological infrastructure. Chukwu et al. (2018) observe that many universities lack reliable high-speed internet connectivity, modern data servers, and sufficient digital storage facilities required for managing large electronic collections effectively. In contrast, universities in developed countries have invested heavily in cloud computing technologies, advanced servers, and integrated digital platforms that ensure seamless access to scholarly resources. Institutions such as Harvard University and University of Oxford have developed sophisticated digital library infrastructures that support efficient information retrieval and remote accessibility. In Nigeria, however, unstable electricity supply further compounds the problem, as students and researchers often experience interruptions while attempting to access online academic materials outside campus environments.

The expansion and viability of digital libraries in Nigerian colleges are still significantly hampered by funding. According to Mohammed et al. (2020), Nigerian institutions sometimes face severe financial restrictions, in contrast to many other countries where governments and commercial organisations make significant investments in academic digitalisation. As a result, colleges frequently find it difficult to maintain their current technical infrastructure, grow their digital collections, or update software systems. The poor condition of digital resources in many postsecondary institutions has also been noted by the National Universities Commission as a result of inconsistent funding policies (Odu & Omosigho, 2017).

Another significant limitation relates to the absence of a centralized national digital repository. According to Wang (2018), advanced economies increasingly utilize open-access frameworks and cloud-based systems that allow institutions to share research materials seamlessly across multiple platforms. Examples include the Digital Public Library of America and Europeana, both of which integrate digital resources from numerous institutions into unified systems (Chiware, 2020). In contrast, Nigerian universities largely operate independent repositories with minimal interconnectivity, resulting in fragmentation and difficulties in accessing research outputs nationally (Agbo, 2021).

Technological innovation within library management systems also remains relatively limited in Nigeria. Artificial intelligence and data analytics are being incorporated into digital libraries in many industrialised nations to enhance user experience, recommendation systems,

cataloguing, and search efficiency (Khan, 2021). On the other hand, a lot of Nigerian colleges continue to use manual or semi-manual cataloguing techniques, which slow down and reduce the effectiveness of information retrieval (Okeji et al., 2020). Users' access to advanced search and personalisation is further restricted by the lack of AI-driven solutions (Abankwa & Run, 2019).

Some Nigerian colleges have made significant strides in bolstering their digital library systems in spite of these obstacles. Covenant University, for example, has established a robust institutional repository that encourages free access to thousands of academic articles (Anasi, 2012). In a similar vein, the University of Lagos created the UNILAG Library repository, which enhances access to scholarly materials by integrating with multiple global research databases (Adedokun et al., 2022). However, many state-owned universities still struggle to set up and maintain efficient digital library systems, and these developments are still restricted to a small number of schools.

**Benefits and challenges of mobile access to digital libraries**

Mobile access to digital libraries is gradually receiving increasing attention in Nigeria due to the rapid spread of smartphones and expanding internet penetration across the country. Abdulahi and Aliyu (2019) note that the growing adoption of mobile technologies presents important opportunities for improving access to academic resources, although several operational challenges remain within the Nigerian context. Through mobile-enabled digital libraries, students and researchers can access scholarly materials conveniently without depending entirely on physical library visits. Agbo (2021) explains that this flexibility helps remove geographical barriers and enables users to retrieve academic information from virtually any location.

Furthermore, Ogunniyi et al. (2024) stress that students who are unable to frequently visit physical libraries might greatly benefit from mobile access to digital libraries. Mobile digital libraries support ongoing academic engagement while reducing reliance on physical collections by offering remote access to thousands of electronic books, journals, theses, and research resources. Additionally, digital libraries help institutions and students by lowering the cost of purchasing and maintaining sizable physical book collections (Chiware, 2020). Nigerian institutions can digitise academic materials and make them available in more adaptable and affordable versions by using mobile platforms.

This process not only lowers expenses related to book procurement and physical storage but also promotes easier preservation and transfer of materials through cloud storage systems, USB devices, and cross-device accessibility (Ntogo-Saghanen & Echedom, 2023). A practical example is the e-library initiative of the National Open University of Nigeria, which has reportedly helped reduce students' dependence on costly physical textbooks (Adogbeji & Akporhonor, 2021). Beyond accessibility and cost reduction, mobile digital libraries also enhance research productivity and academic excellence by providing users with access to current journals, conference proceedings, and scholarly literature (Fernández-Molina et al., 2022). Wang (2018) observes that mobile-enabled digital libraries create opportunities for international research collaboration and increase the visibility of Nigerian academic outputs within the global scholarly community.

Partnerships between Nigerian colleges and foreign academic publications that grant access to reliable databases like JSTOR and Springer have made this

increasingly apparent (Obuezie et al., 2022). Students and researchers can more successfully interact with current global research developments when they have access to these platforms. The effective development and uptake of mobile digital library services in Nigeria are still hampered by a number of issues, despite these important advantages. Poor internet connectivity combined with expensive mobile data services is one of the most commonly mentioned barriers (Abankwa & Run, 2019). Unreliable network connectivity is a common problem for students living in underprivileged and rural areas, making it challenging to download and access academic resources (Unegbu et al., 2023).

Additionally, the frequency with which many students can access digital materials—especially those that demand high data consumption—is restricted by the rising cost of internet connections. The delayed uptake of mobile digital library services is also largely due to institutional and infrastructure constraints. According to Adedokun et al. (2022), the sustainability and effectiveness of digital library efforts in many Nigerian universities are adversely affected by insufficient institutional support. Many organisations don't have enough money to expand, upgrade, and maintain their digital systems. Additionally, students' access to digital resources and mobile learning platforms is still hampered by the inconsistent electricity supply in several regions of the nation (Olubiyo & Olubiyo, 2023).

Another significant issue with mobile access to digital libraries is security-related worries. Cyber dangers, unauthorised access, and intellectual property infringement continue to be major risks in digital academic contexts, according to Aboagye et al. (2020). International publishers are frequently deterred from providing unlimited access to Nigerian institutions by the unapproved sharing and replication of copyrighted works (Chukwu et al., 2018). As a result, some students turn to using academic materials that have been pirated, which compromises academic integrity and ethical research norms (Sahabi & Otobo, 2021).

**Digital library service models and frameworks**

In order to explain the acceptance, usefulness, efficacy, and sustainability of mobile digital library services, academics and technology specialists have been inspired to create a number of theoretical models and frameworks. These frameworks offer several viewpoints on how digital library systems might be organised and run to enhance accessibility and user experience. The Technology Acceptance Model (TAM) is one of the most used frameworks. Awoyemi and Awoyemi (2020) claim that TAM emphasises two key elements—perceived utility and perceived ease of use—to explain users' acceptance and adoption of digital technologies. According to the concept, researchers and students are more inclined to use digital platforms in the context of mobile digital libraries if they find them useful and user-friendly.

According to Agbo (2021), TAM has been extensively used in research looking at user adoption trends in higher education institutions, particularly in settings where levels of digital literacy vary significantly. Anusha et al. (2020) observed that a number of mobile digital library systems at Nigerian institutions had poor usage, in part because users believe certain platforms are hard to use and not sufficiently user-friendly. Students' willingness to regularly interact with available digital resources is frequently diminished by subpar interface design and a lack of user orientation.

Despite its applicability, the Technology Acceptance Model has come under fire for failing to sufficiently take into

consideration the external socioeconomic and infrastructure elements that affect the adoption of technology. Regardless of customers' opinions of their utility or usability, Ntogo-Saghanen and Echedom (2023) contend that problems including erratic internet access, poor infrastructure, and costly mobile data subscriptions have a major impact on the uptake of mobile digital libraries in Nigeria. For instance, expensive internet fees often force students at Ahmadu Bello University to stop using mobile digital library services, according to Unegbu et al. (2023).

The Technology Acceptance Model has been criticised for not adequately accounting for the external socioeconomic and infrastructure factors that influence technology adoption, despite its relevance. Ntogo-Saghanen and Echedom (2023) argue that issues including inconsistent internet connectivity, inadequate infrastructure, and expensive mobile data subscriptions have a significant impact on the adoption of mobile digital libraries in Nigeria, regardless of consumers' perceptions of their usefulness or usability. According to Unegbu et al. (2023), for example, costly internet fees frequently compel students at Ahmadu Bello University to discontinue using mobile digital library services.

Because the systems are more closely adapted to users' expectations and experiences, research shows that mobile digital library platforms created employing user-centred concepts frequently see higher levels of user satisfaction and adoption (Ogunniyi et al., 2024). However, there are certain drawbacks to the UCD approach. According to Abdulahi and Aliyu (2019), the model's reliance on ongoing user assessment and feedback could impede implementation procedures, especially in establishments with limited financial and technical resources. Universities may find it difficult to maintain the frequent testing and redesign procedures necessary for successful user-centred development in such circumstances.

Within the Nigerian context, the User-Centered Design (UCD) model is considered particularly valuable because it allows digital library platforms to be developed in ways that reflect the technological abilities, learning patterns, and preferences of students and researchers (Mohammed, 2013). By focusing on users' experiences and expectations, the model contributes to the development of more accessible and user-friendly mobile digital library systems. Nevertheless, the implementation of UCD principles in Nigeria is still affected by several limitations, including inadequate funding for usability testing and the shortage of professionals with expertise in user-centered design approaches (Amini et al., 2021). Despite these challenges, some institutions have recorded notable progress. For instance, the University of Ibadan has reportedly applied UCD principles in developing aspects of its e-library platform, thereby improving accessibility and ease of navigation for users (Tom-George & Onyema, 2022).

The Digital Library Reference Model (DLRM), which offers an organised method for creating and assessing digital library systems, is another framework pertinent to the creation of digital libraries. Sahabi and Otobo (2021) claim that DLRM detects critical elements including users, digital material, system functionality, policies, and access management structures. The concept serves as a foundation for mobile digital libraries, assisting in the systematic organization of digital materials and the explicit definition of access rights (Omeluzor et al., 2022). According to Aboagye et al. (2020), DLRM has made a substantial contribution to the standardisation and organising of digital libraries in numerous developed nations.

However, due to institutional and technological limitations, the usage of DLRM in Nigerian universities is still very restricted. The framework's reliance on established digital regulations and operational standards, many of which are inadequate or nonexistent in Nigeria, is one of its main criticisms (Adogbeji & Akporhonor, 2021). Mohammed (2013) notes that many Nigerian colleges continue to function without complete national digital library policy, in contrast to institutions in the US and certain regions of Europe where digital library principles are more standardised. Furthermore, the complete deployment of organised digital library systems remains challenging due to infrastructure issues including inadequate electrical supply and erratic internet access (Mohammed et al., 2020).

**Interpretation and implications**

This examination of the literature in this paper offers a wealth of information about the increasing importance of mobile digital libraries in higher education, especially in developing nations like Nigeria. The results of the examined studies show that mobile digital library services are becoming more and more crucial tools for boosting learning flexibility, facilitating research activities, and improving access to academic resources. Scholars have frequently highlighted the pervasiveness of mobile digital libraries in the literature, pointing out that these services allow users to access academic texts via mobile technologies at any time or place (Awoyemi & Awoyemi, 2020; Wang, 2018).

Because many students in Nigerian institutions struggle with overcrowded physical libraries, a lack of learning materials, and restricted access to current academic resources, mobile digital libraries seem particularly important (Chiware, 2020). By offering remote access to electronic books, journals, theses, and research databases, mobile digital platforms may be able to close these gaps, according to the evaluated studies. As a result, mobile digital libraries provide significant chances to enhance learning outcomes and increase academic engagement among researchers and students.

Despite these advantages, the literature also identified several challenges affecting the practical implementation and sustainability of mobile digital library services in Nigeria. One of the most recurring concerns relates to inadequate internet infrastructure. Several studies observed that unstable internet connectivity, high mobile data costs, and unreliable electricity supply significantly hinder effective access to digital academic resources (Agbo, 2021; Ogunniyi et al., 2024). These infrastructural limitations are particularly severe in rural and underserved communities where students may already experience restricted access to educational technologies. As a result, although mobile digital libraries offer strong theoretical potential for promoting flexible learning, their practical effectiveness within Nigeria remains constrained by broader socio-economic and technological realities.

The literature also shows that cloud computing technologies are becoming more and more important for mobile digital library systems due to their cost-effectiveness, scalability, and flexibility (Okeji et al., 2020; Alguliyev & Ismayilova, 2017). Large amounts of academic resources can be stored and managed by organisations using cloud-based technologies, which also make it simpler for users to access them remotely. However, in the Nigerian context, research examined in this paper also draw attention to issues with accessibility, long-term affordability, and data security (Mohammed, 2013; Amini et al., 2021). Even though cloud computing is a good substitute for conventional on-premise library systems, Nigerian institutions continue to struggle

with the financial resources, technical know-how, and infrastructure preparedness required for successful deployment.

Adopting hybrid digital library systems, which integrate digital and physical resources to provide a more comprehensive and adaptable framework for information access, is another feasible strategy for enhancing digital library services in Nigeria (Adedokun et al., 2022). According to Sahabi and Otobo (2021), the hybrid library model combines traditional library services with digital and mobile technology to satisfy the various academic and research needs of instructors and students. This strategy is especially useful in settings where infrastructure and budgetary constraints may still prevent a complete digital transition. Universities can better serve consumers with different levels of digital access and technological proficiency by integrating electronic resources with physical collections.

The literature reviewed in this study provided substantial insight into the opportunities and limitations associated with mobile digital library services. Nevertheless, several research gaps were identified across the reviewed studies. One notable gap relates to the limited availability of empirical evidence assessing the actual effectiveness and impact of digital libraries within Nigerian universities. Although many studies discuss implementation challenges and potential benefits, fewer studies provide measurable evaluations of how mobile digital libraries influence learning outcomes, research productivity, or academic performance. In addition, there is still limited scholarly discussion concerning the long-term sustainability of digital library systems, particularly in relation to policy development, institutional regulation, and funding frameworks required to sustain mobile digital library initiatives in Nigeria (Aboagye et al., 2020; Omeluzor et al., 2022).

The results also imply that enhancing the growth and sustainability of mobile digital library services in Nigeria requires more cooperation between government agencies and the private sector. Efforts to expand digital library systems may stall or eventually fail in the absence of strong regulatory frameworks, wise investments, and long-term financing sources.

The following suggestions are put out to enhance mobile digital library services at Nigerian institutions in light of the study's findings:

1. The Nigerian government, in partnership with international organizations, should provide financial support and grants to universities for the digitization of academic resources and the expansion of mobile-friendly digital library platforms.
2. Telecommunication providers should introduce subsidized internet data plans for students and researchers accessing educational and digital library platforms in order to reduce financial barriers to usage.
3. Government agencies and private sector organizations should collaborate to improve internet infrastructure and network accessibility to support seamless mobile access to academic resources.
4. Universities across Nigeria should incorporate digital literacy training into their academic curricula to equip students and lecturers with the technological skills required for effective utilization of mobile digital libraries.
5. Policymakers and educational stakeholders should establish supportive policies and incentive structures that encourage easier

access to scholarly publications and digital academic materials for Nigerian students and researchers.

## Conclusion

The evolution and importance of mobile digital library service systems in Nigerian institutions were investigated in this study. The study's conclusions show that mobile digital libraries are a significant, game-changing project that can solve significant issues with efficiency, affordability, and accessibility in higher education. Mobile digital libraries give students and scholars more flexible access to academic information and intellectual materials in many Nigerian universities where traditional library systems are frequently hampered by out-of-date items, insufficient physical space, and scarce funding. Mobile technologies improve academic engagement, research activities, and overall learning experiences by enabling users to effortlessly access learning resources from any location.

The multiple advantages of mobile digital libraries, such as greater accessibility, cost-effectiveness, research cooperation, and better knowledge distribution, are further highlighted by the literature evaluated in this study. But the study also found a number of enduring obstacles that prevent these methods from being successfully implemented in Nigeria. Inadequate digital infrastructure, erratic electrical supply, expensive internet subscription fees, a lack of financing, low levels of digital awareness, and shoddy regulatory frameworks are some of these issues.

All things considered, mobile digital libraries have a great deal of potential to change Nigerian university students' access to academic resources and information. However, strategic infrastructure investments, increased institutional support, better policy implementation, and ongoing technological advancements aimed at guaranteeing equitable and long-term access to digital learning resources will be critical to the sustainability and efficacy of these systems.

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