

# Barriers And Enablers to The Implementation of Mobile Learning Platforms in Rural Nigerian Education Systems

ACHUONYE, KEZIAH AKUOMA<sup>1</sup>, USHIE, BESHEL CLETUS<sup>2</sup>, WILLIAMS, ANNE CHIDINMA<sup>3</sup>

<sup>1,3</sup> *Department of Educational Technology, Ignatius Ajuru University of Education, Port Harcourt.*

<sup>2</sup> *Educational Technology Department, University of Calabar. Calabar.*

**Abstract-** *This paper examined the barriers and enablers to the implementation of mobile learning platforms in rural Nigerian education systems. Mobile learning platforms, which enable access to educational content through smartphones and tablets, offer a promising pathway for expanding learning opportunities anytime and anywhere. However, the implementation of mobile learning platforms in rural Nigerian education systems faces significant barriers identified among others as inadequate ICT infrastructure, unreliable electricity and network connectivity, high costs of devices and data plans, and low digital literacy. Several enablers and policy frameworks support mobile learning integration. National initiatives such as the National Policy on Information Technology, National Educational Technology Policy, National Digital Economy Policy and Strategy, and Smart Schools Initiative. Complementary strategies include infrastructure investment, public-private partnerships, professional development for educators, affordable device schemes, localized content development, inclusive and gender-sensitive approaches, solar-powered solutions, community engagement, and impact evaluation mechanisms. It argues that a coordinated, inclusive, and context-sensitive approach—anchored in sustainable infrastructure, digital literacy development, affordability, and policy coherence—is essential for leveraging mobile technologies to bridge the rural-urban educational divide and promote equitable access to quality education.*

**Index Terms-** *Barriers, Enablers, Mobile Learning Platforms, Rural Nigerian Education Systems.*

## I. INTRODUCTION

Education has been adopted by nations, both developed and developing, as a potent tool for the growth and development of their citizenry. Although Nigeria as a nation is experiencing a rapid growth trend in urbanisation, more than 170 million (45.12%) of its citizens are found in rural areas. These populations lack access to reliable internet

connectivity and modern technological devices, thereby exacerbating inequalities in educational opportunities. Nigeria, the sixth most populous country in the world and the first in Africa, with an estimated population of 236,614,615 (Population.com.nigeria) in 2025, has equally adopted education as a tool for national development. One of the offshoots of the introduction of information and communication technology in education is the emergence of mobile communication technology in educational systems. This paper examines the concept of mobile learning platforms, the various platforms available, barriers hindering their effective implementation in rural Nigerian education systems and identifies strategies that can be adopted to improve their performance and pathways that can enhance their effectiveness in rural Nigerian education systems.

This phenomenon has often been described as the digital divide (Unwin, 2017). Various levels of government have taken responsibility to initiate programmes to foster conducive environment by integrating technologies to avert systemic issues (Olawale & Raji, 2021). One such technology is the mobile communication platform which is a digital environment that enables learners to access educational content, resources and tools using mobile devices such as smartphones and tablets. These platforms leverage mobile technology to facilitate learning anywhere, anytime and often incorporate features such as micro learning, gamification personalization, collaboration and analytics.

Some popular mobile learning platforms include Udemy, Coursera, edX, LinkedIn Learning, Khan Academy, Moodle, Blackboard, and Google Classroom. Strategies that can be implemented through these platforms include the following:

- a. *Mobile-first design*, which involves creating content and interfaces that are specially designed for mobile devices.
- b. *Content chunking*, which involves breaking large or complex content into smaller, manageable chunks.
- c. *Offline access*, which allows learners to access content offline or with limited internet connectivity.
- d. *Push notifications*, which make use of notifications to remind learners of new content, updates, or deadlines.
- e. *Social learning*, where learner-to-learner interaction through discussions and collaboration is encouraged.
- f. *Continuous feedback*, which provides regular and consistent feedback and assessments to identify areas of weakness.
- g. Learning Management Systems (LMS), Human Resource Systems, and other relevant systems (Omolara, Opara, & Ngongpah, 2025).

#### Barriers To the Implementation of Mobile Learning Platforms in Rural Nigerian Schools

Desired impact of mobile learning has continued to be hindered by several factors (Adedoyin & Sosa, 2020).

*i. Limited Information communication Technology Infrastructure:* Most of the hinterlands of Nigeria lack access to reliable electricity supply, as they are poorly served. Power outage is common alongside unreliable internet connectivity and poor telecommunication networks making it extremely difficult to establish and sustain mobile learning services. Low affordability and accessibility of mobile devices, as well as the high cost of internet data, also act as hindrances to the execution of mobile learning in rural areas of Nigeria. This is largely due to the low socioeconomic status of inhabitants in rural areas, who not only lack access but also cannot afford the cost of the gadgets required for internet connectivity (Nwokedi & Agwagu, 2021).

*ii. Low digital literacy among adult caregivers:* This issue is further worsened by the fact that most people exposed to digital literacy prefer to stay in urban centers, where they can enjoy modern amenities,

leaving behind the deprived environments of rural areas (Okon & Udo, 2021). Consequently, rural areas are frequently inhabited by older adults who are deficient in the skills and knowledge required to operate digital devices (Nwogu, Okafor, & Ibe, 2021). This is evident in World Bank data, which shows that over 50% of Nigerians lack basic digital skills; only 68% can use smartphones at a basic level, and only 39% can operate laptops or tablets. Gender disparities are also evident, with only 38% of females being aware of mobile internet, compared to 62% of their male counterparts (NITDA, 2025; Adegoke & Adebayo, 2020).

*iii. Language and content localization:* Nigeria is a heterogeneous nation with well over two hundred and fifty (250) ethnic nationalities. Though there are three dominant languages of Hausa, Yoruba and Igbo, with 27%, 21% and 14% populations respectively, there are other numerous ethnic minorities with varied languages and dialects. Unfortunately, most capital technological services are developed in English majorly (Ushioda, 2017). This neglects Nigeria's linguistic diversity and plurality, hence limiting their usefulness for most of the rural populations.

*iv. Cultural and Social Inhibitors:* Nigeria is socially diversified nation with varied cultural practices, beliefs, and traditions. Most adherents of these cultural customs would sometimes be resistant to change or prefer traditional communication methods such as wooden gongs, whistles, and other similar means. In some instances, cultural norms and beliefs such as seclusion of certain persons in isolated rooms, disparities in the exposure of males and females to the tenets of Western education can create barriers to mobile learning platform adoption.

*v. Network Issues:* Mobile learning platforms are mostly adversely affected by unavailable or unsuitable telecommunication network infrastructure in the rural areas of Nigeria. The status of network infrastructure makes it difficult for educators to engage in mobile learning activities.

*vi. High Cost:* Both mobile devices and data plans are on average above the purchasing power of average Nigerians, especially students and rural dwellers. Though there are variations in the cost of

data plans across service providers such as MTN, Airtel, Glo, and 9mobile, the following data plan cost ranges are obtainable: Daily plans range from 75MB for ₦75, 1GB for ₦500, weekly plans range from 2GB at ₦1,500 to 6GB for ₦2, 2GB500, monthly plans range from 2GB for ₦1,500 to 36GB for ₦11,000 (naijatech.com). These relatively high costs of data plans limit access to mobile learning platforms, particularly for students from rural areas, disadvantaged backgrounds and low-income earners. The high costs of data plans are aggravated by regulation governing their use by the consumers. For instance, if a customer struggles to procure a data plan of say 36GB for use in one month and was unable to exhaust it within the specified duration, he would be barred from using it as he will be requested to buy a similar bundle to be able to roll over the unused data or forfeit the balance.

*vii. Resistance to change:* This is a fundamental challenge to the implementation of mobile learning platforms especially in the rural education systems in Nigeria. This can be explained from different perspectives to include educators, students and other stakeholders being deficient in digital skills/knowledge due to their status as digital immigrants. The prevalence of Born Before Computer (BBC) teachers in Nigerian rural schools readily comes to mind as these may not understand how to use the platforms or being afraid of being replaced or displaced by the computers (Ijeoma & Kalu, 2021). In addition, many educators and administrators are accustomed to traditional teaching and administrative methods and may be hesitant to adopt new technologies due to uncertainties about their effectiveness or the additional workload that may entail their adoption.

*viii. Lack of government support:* There are a myriad of robust and inconsistent policies and initiatives that hinder mobile technology adoption in Nigeria especially in the rural areas (World bank, 2021). While there may be commitments to integrate mobile technology within the educational framework, many initiatives suffer from inadequate funding, haphazard implementation and incoherence, thereby leading to their eventual collapse (Ijeoma, Agbo & Kalu, 2021; Zhang & Wang, 2020). Moreover, there are policy restrictions or inhibitions that prohibit or limit the use

of mobile devices during official school hours, just like there is lack of technical support and maintenance for mobile devices.

*ix. Gender disparities:* This exists between men and women in both ownership of smartphones and the use of services in the rural areas of Nigeria. Research shows that while 50% of men own smartphones, only 39% of their female counterparts (indicating 23% gender gap) use the facility. Again, while about 34% of women use internet services, their male counterparts have about 56%. The implication of this is that women, who are usually caregivers of children in rural areas, are deficient in the use of mobile learning platforms for the technological upbringing of children.

#### Enablers To the Implementation of Mobile Learning Platforms in Rural Locations

There are diverse and visible ways the government and private policies and initiatives have been floated to mitigate the challenges of implementing mobile learning platforms successfully in the hinterlands of Nigeria.

National Policy on Information Technology (2001): The Nigerian government formulated this policy to promote the use of information technology in various sectors, including education. It aims to integrate ICT into the educational system to enhance teaching and learning processes (Bada, 2018).

National Educational Technology Policy (2017): The Nigerian Ministry of Education launched this policy to provide a framework for implementing technology in education. It emphasizes the importance of ICT in primary, secondary, and tertiary education while promoting the development of digital literacy among students and teachers (Olayode, 2019; U.S. Department of Education, 2019).

Smart Schools Initiative: This initiative is aimed at developing smart schools across Nigeria by equipping them with ICT infrastructure. The programme intends to enhance educational delivery through digital resources and seamless internet access, thereby promoting an interactive learning environment across Nigeria (Adebayo, 2020).

Universal Basic Education (UBE) Programme: The UBE program emphasizes the integration of technology in basic education. Part of its mandate is to provide educational resources, training workshops for teachers, and the implementation of ICT-based learning methods to improve educational outcomes (Oni, 2019).

Partnership with International Organizations: The Nigerian government collaborates with international organizations such as United Nations Educational and Scientific and Cultural Organization (UNESCO) and the World Bank to promote technology in education. These partnerships are aimed at providing technical support, funding, and resources necessary for the successful implementation of educational technology initiatives especially in rural Nigeria (Ademola, 2020).

National Digital Economy Policy and Strategy (2020): This policy outlines specific objectives for digital transformation, including enhancing ICT education and digital skills among students. It aims to bolster the use of technology in educational institutions while promoting innovation and research (Mohammed, 2021). For example, the 3 million Technical Talent (3MTT) programme has trained 350,000 in digital skills. The goal of the programme is to integrate digital education from primary to tertiary levels alongside training national youth service corpse (NYSC) members to become digital ambassadors. This project is supported by infrastructure including 90,000km of fiber optic cable and digital centers in all states (Inuwa, 2025).

E-learning Platforms and Digital Content Development: The Nigerian government has initiated the development of e-learning platforms, such as the National Open University of Nigeria (NOUN) online learning portal. Additionally, initiatives like the Nigeria Learning Passport aim to create digital content tailored to the Nigerian educational curriculum to foster inclusive and equitable education (Udo & Ukpe, 2021).

Strategies For Facilitating the Adoption of Mobile Learning Technology in Rural Areas

Some strategies that have been adopted by governments and private participants to integrate mobile technologies in rural Nigeria include but not limited to are as follows.

*Investment in Infrastructure Development:* Investment in infrastructure development is crucial for the successful adoption of educational technology. Governments and educational institutions must prioritize upgrading existing facilities with high-speed internet, reliable Wi-Fi networks, and modern technological equipment. A strong digital infrastructure enables educators and students to leverage various learning tools and online resources effectively as is countries like South Korea (Kim et al., 2020). Developing solar-powered mobile learning platforms to provide stable, consistent, and reliable access to digital technologies would keep alive interest, commitment and adoption in areas with limited or no electricity supply.

*Promoting Public-Private Partnerships in Education Technology:* Public-private partnerships (PPPs) serve as a viable strategy for facilitating technology adoption in education. By combining resources and expertise from both sectors, these collaborations can create innovative educational solutions that cater to diverse learning needs. These partnerships foster the development of customized curricula, training programmes, and technological solutions that can be adapted to local contexts (Johnson et al., 2021). Engaging with local leaders, influencers, communities through Mobile Network Operators (MNO) partnerships promotes mobile technology and address concerns related to its use. Community involvement can build trust and encourage adoption.

*Enhancing Professional Development for Educators:* Adequate training enables educators to understand and effectively use technological tools, fostering a smoother transition from traditional teaching methods (Alude, et al., 2020; Baker, 2020). Research indicates that ongoing professional development programmes focused on technology-based teaching methodologies can significantly improve student learning outcomes (Ertmer & Ottenbreit-Leftwich, 2013; Tan & Wong,

2020). In countries such as Finland, comprehensive training and support systems have been linked to the successful implementation of educational technology in classrooms, resulting in high levels of educator satisfaction and student engagement.

*Increasing Access to Affordable Technological Devices:* Access to affordable technological devices is crucial for reducing inequalities in educational opportunities (Smith, Jones & Taylor, 2019). Governments, educational institutions, and technology companies must work together to develop initiatives that provide students with low-cost or subsidized devices. Such initiatives require collaboration with local businesses and community organizations to effectively reach underserved populations (OECD, 2020). Furthermore, creating a secondary market for refurbished devices can provide additional opportunities for students to obtain affordable technology while simultaneously encouraging environmental sustainability.

*Creating Customized Learning Environments:* Leveraging learners' unique needs and preferences, technologies such as adaptive learning software can tailor educational content based on individual performance, enabling students to progress at their own pace while fostering motivation and engagement. Research shows that personalized learning experiences, with considerations for local contents and indigenous languages (Garca & Wei, 2014) can significantly enhance student performance, particularly for those struggling with traditional teaching approaches (Kaufman & O'Rourke, 2021; Darwin & Norton, 2014; Flores & Beardsmore, 2015). Institutions should focus on developing flexible learning spaces equipped with diverse technologies, allowing students to engage with content through their preferred media. This approach promotes deeper learning and accommodates varied pedagogical styles among educators.

*Ensuring Data Privacy and Security:* Adopting educational technology comes with the responsibility of ensuring data privacy and security for both students and educators (Ibrahim, 2017). Institutions must adopt best practices for data management, including encryption and secure access protocols, to safeguard student information. Countries such as

those in the European Union have established comprehensive data protection regulations, such as the General Data Protection Regulation (GDPR), which can serve as a model for other nations (European Commission, 2018).

*Fostering a Culture of Innovation:* Creating a culture of innovation within educational institutions can significantly enhance technology adoption efforts (Olatunji & Houghton, 2021). Encouraging experimentation and creative problem-solving empowers educators to explore and incorporate new technologies into their teaching practices. Institutions may establish "innovation days" where teachers share their experiences with technology, learn from one another, and collaborate on cross-disciplinary projects (Pérez-Escoda et al., 2022). Encouraging a growth mindset while emphasizing the potential of technology as a tool for improvement can enable more dynamic adaptation to emerging digital tools.

*Evaluating and Measuring Impact:* It is essential to establish evaluation frameworks for monitoring and measuring the impact of technology adoption in educational settings (Adedeji, 2020). Continuous assessment allows institutions to identify areas for improvement, refine practices, and scale successful initiatives. By gathering quantifiable data on student outcomes related to technology use, educational leaders can make informed decisions about future investments and strategies. Many education systems worldwide employ models such as the Technology Acceptance Model (TAM) to analyze the acceptance and use of technology among educators and students (Venkatesh & Bala, 2008). Implementing structured evaluation techniques enables schools to evolve and optimize their technology integration strategies effectively.

## II. RECOMMENDATIONS STAKEHOLDERS' ROLES IN MOBILE LEARNING TECHNOLOGY INTEGRATION

Each stakeholder has certain roles in ensuring proper integration of M-Learning in rural schools.

**Government Agencies:** They formulate policies and standards that guide the adoption of mobile learning platforms within schools and other tertiary

institutions. For instance, the Nigerian government, through national policy on Information Technology has aimed to enhance the educational environment by promoting ICT infrastructure and training teachers in technology use. This top-down approach ensures that there are guidelines and resources allocated specifically for the integration of technology in educational curricula (Bada, 2018). Bridging the digital divide in Nigeria is essential for fostering equitable access to education and enhancing the quality of learning experiences for all students.

**Educational Institutions:** Institutions must invest in necessary infrastructure, such as hardware and software, to support digital learning environments. They facilitate teacher training programmes that equip educators with the necessary skills to effectively use technology in their teaching practices.

Research suggests that when institutions actively promote technology use, student engagement and academic performance tend to improve (Olayode, 2019). Moreover, curriculum reforms that incorporate technology-focused learning can prepare students for a digital economy and better equip them with the skills necessary for future job markets.

**Teachers:** Teachers are responsible for selecting appropriate digital tools and resources that align with curriculum objectives and meet the diverse needs of their students. An effective teacher utilizes technology not only as an instructional tool but also to foster collaborative learning among students. Continuous professional development is essential for teachers to stay updated on evolving technologies and to implement them effectively in their classrooms. Consequently, teachers' attitudes toward technology significantly influence students' learning experiences and outcomes (Ademola, 2020).

**Learners (students/pupils):** These are primary stakeholders in the integration of technology in education, as they are the end-users of the educational products and tools developed. Their engagement with technology directly impacts their learning outcomes. As digital natives, students often adapt quickly to new technologies; however, their feedback and needs should be taken into

consideration when implementing technology in the educational landscape (Udo & Ukpe, 2021).

**Private Sector and Technology Providers:** These organizations often collaborate with educational institutions to develop customized educational software, hardware, and training resources. Their involvement can offer innovative solutions and financial support. Such partnerships can enhance the quality and availability of technological resources, ensuring that all students could benefit from modern educational techniques (Oni, 2019). Ultimately, a coordinated and strategic approach from the Nigerian government, inclusive of policies that prioritize technology in education, will be vital in narrowing the digital divide. The success of these initiatives will not only pave the way for a more informed and skilled population but also strengthen national development in an ever-evolving global landscape.

### III. CONCLUSION

The integration of mobile learning platforms into rural Nigerian education systems presents both a critical necessity and a transformative opportunity. Several interconnected challenges reinforce the digital divide and perpetuate systemic educational inequalities. However, mobile learning platforms, when thoughtfully designed and strategically deployed, can expand access to quality educational resources beyond the physical classroom, enabling flexible, personalized, and inclusive learning experiences. Government policies demonstrate formal commitment to digital transformation in education. Complementary private initiatives with international organizations further highlight ongoing efforts to strengthen ICT integration. And, for mobile learning to achieve sustainable impact in rural Nigeria, implementation must move beyond policy declarations to coordinated actions involving the stakeholders. Ultimately, bridging the rural-urban educational divide through mobile learning requires a holistic, inclusive, and context-sensitive approach that aligns technological innovation with social realities.

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