THE POTENTIAL OF SMARTPHONE TECHNOLOGY FOR ADULT LITERACY DEVELOPMENT IN NIGERIA: OPPORTUNITIES, CHALLENGES, AND STRATEGIES

UMMU HASSAN BABANZARA, PhD
Department of Adult Education and Community Services
Bayero University, Kano, Nigeria
E-Mail: ummuhzara@gmail.com

Abstract

This paper explores the transformative potential of smartphone technology for adult literacy development in Nigeria, addressing opportunities, challenges, and strategic integration. Despite widespread smartphone penetration offering unique educational avenues, a significant portion of Nigerian adults still face low literacy levels due to traditional barriers like limited access to learning centers, inadequate materials, and rigid curricula. Smartphones, acting as portable mini-computers, can overcome these hurdles by providing access to diverse educational applications, e-books, and multimedia content, facilitating personalized and self-directed learning, and fostering virtual learning communities. While the promise is substantial, challenges include the digital divide, lack of digital literacy, and infrastructure limitations. The paper examines existing initiatives, best practices, and innovative strategies for leveraging smartphones, emphasizing the redefined roles of educators as facilitators. It suggests policy interventions for seamless integration, including subsidies for devices, comprehensive digital literacy training, and the development of culturally relevant content. Ultimately, integrating smartphone technology into Nigeria's national adult literacy framework is crucial for empowering adults and driving national development in the 21st century.

Introduction

Nigeria, Africa's most populous nation, is experiencing a profound digital revolution driven by widespread smartphone adoption (Anshari, et al., 2017; GSMA, 2025). This transformation offers a unique opportunity to tackle persistent societal challenges, particularly low adult literacy levels, which hinder socio-economic empowerment and national development (GSMA, 2025). This paper explores the multifaceted potential of smartphones as a transformative tool for enhancing adult literacy in Nigeria, addressing traditional hurdles such as limited access to learning centers, scarcity of qualified instructors, and inadequate materials (Oduoye, 2019).

Smartphones, now powerful mini-computers, offer access to a vast array of educational applications, e-books, online courses, and multimedia content. Their interactive nature, with features like text-to-speech and speech-to-text, can significantly facilitate learning for adults (Kukulska-Hulme & Traxler, 2020). Beyond formal learning, smartphones enhance informal and self-directed learning through virtual communities on social media and messaging apps, where adults can practice skills and receive support (Vavoula & Sharples, 2021). While the promise is substantial, challenges like digital literacy, equitable access, and culturally relevant content must be addressed (UNESCO, 2019). This paper will delve into specific ways smartphones can be leveraged, examining existing initiatives, best practices, and proposing innovative strategies to contribute to a more literate, empowered, and digitally inclusive Nigeria.

Existing Initiatives for Adult Literacy in Nigeria

Nigeria acknowledges the vital role of adult literacy, with various governmental and non-governmental organizations working to combat high illiteracy rates. The National Commission for Mass Literacy, Adult & Non-Formal Education (NMEC) is the primary governmental body, spearheading programs like "Revitalization of Adult & Youth Literacy" (RAYL) and "Literacy by Radio," aiming to provide functional literacy, numeracy, and life skills (National Commission for Mass Literacy, Adult and Non-Formal Education (NMEC), (n.d.)). The National Policy on Education also supports adult education (Ugwu, 2023).

Non-Governmental Organizations (NGOs) significantly contribute, with the Nigerian Non-Governmental Association for Literacy Support Services (NOGALSS) acting as an umbrella body (Olayinka, 2020). Organizations like UNESCO and ActionAid Nigeria run programs such as "Enhancing Literacy for Sub-Saharan Africa," often targeting marginalized populations (Yusuf, et al., 2020; Yusuf, 2022).

Despite these efforts, existing initiatives face challenges. Government programs likely have limited reach and inconsistent implementation, failing to address the vast number of illiterate adults. Insufficient funding and fragmented NGO efforts may also neglect vulnerable groups. The long-term retention of literacy skills remains questionable, suggesting potential shortcomings in curriculum, teaching, or post-literacy support (Aderinoye, 2007). Thus, there's a need for innovative strategies.

Best Practices and Innovative Strategies

Effective adult literacy in Nigeria demands a flexible, learner-centered approach that integrates functional literacy, life skills, and vocational training, aligning with the National Policy on Education (NPE, 2013). High-quality instructors, equipped through continuous professional development and adequate incentives (Yusuf & Tsagem, 2024), are essential, as are conducive learning environments (Zakari & Yusuf, 2014).

Innovative strategies increasingly incorporate technology. Artificial intelligence (AI) offers potential for personalized learning tools, translation aids, and adaptable literacy programs (e.g., Al-Nabhani, Hamzah, & Abuhassna, 2025; Ouyang & Jiao, 2021; Tapalova & Zhiyenbayeva, 2022). Online learning platforms like "Daariz" have demonstrated success in reducing the time to achieve functional literacy (Ahmed, 2016; Bond et al., 2021; Haleem et al., 2022). Assistive technologies like text-to-speech software can significantly aid adults with reading disabilities (Silver-Pacuilla, 2007).

Beyond direct instruction, technology facilitates progress monitoring and program evaluation through data analytics (Nguyen, Gardner, & Sheridan, 2020; Soncin & Cannistrà, 2022). Smartphones, in particular, offer significant benefits for adult learners due to their accessibility and ability to motivate (Olabisi & Adeleke, 2018; Wagner et al., 2014).

Smartphone Applications and Platforms for Adult Learning

Smartphone applications and platforms have revolutionized adult learning by offering flexibility, accessibility, and diverse learning methods (Stafford, 2023). These tools

cater to adults balancing various commitments, enabling continuous learning at their convenience (Zhang & Saadat, 2025). The widespread use of mobile devices means learning can happen anytime, anywhere, turning brief moments into valuable learning opportunities (Kong & Wei, 2013).

Language-learning apps like Duolingo and Memrise use gamification and concise lessons for engaging language acquisition (Udemy, n.d.). Professional development platforms such as LinkedIn Learning and Udemy offer extensive courses for upskilling or reskilling, providing customizable, practical content (Udemy, n.d.). Specialized apps like NASA also offer access to educational resources for self-directed learning.

Mobile-optimized Learning Management Systems (LMS) platforms, including TalentLMS, 360Learning, and Moodle, offer comprehensive solutions for corporate training, higher education, and professional development (Sharples et al., 2015). They provide flexibility, allowing offline access to materials and automatic syncing (Traxler, 2007). Many also integrate collaborative features, fostering peer-to-peer learning and community building (Knowles et al., 2015).

The effectiveness of these platforms stems from their alignment with adult learning principles. Self-directed learning offers autonomy and control over the learning path (Stafford, 2023). Multimedia, simulations, and real-life case studies connect new knowledge to existing experiences, enhancing engagement. The prevalent microlearning format delivers information in digestible chunks, catering to adults' limited time (Kong & Wei, 2013).

In essence, the best smartphone applications and platforms for adult learning prioritize flexibility, relevance, and engagement, adhering to principles of adult education. These tools empower adults to pursue lifelong learning, adapt to new challenges, and enhance skills. The ability to access diverse learning resources anytime, anywhere is crucial for effective mobile learning for adults (Zhang & Saadat, 2025).

Opportunities Presented by Smartphones to Enhance Adult Literacy Development

Smartphones present a significant chance to improve adult literacy in Nigeria by overcoming traditional obstacles like limited resources and low program attendance. Given the widespread use of mobile phones in Nigeria (Okocha, 2022), these devices can reach individuals in remote areas, offering flexible and accessible learning options. This portability allows adults to learn at their own pace, addressing common time and location constraints. The integration of mobile learning (m-learning) apps further enhances this, delivering "micro-modules" with short audio lessons, SMS reinforcements, and interactive quizzes. Initiatives like Cell-Ed in Niger, which uses shared indigenous languages like Hausa, show how effective multimedia-rich content can be (Adewale and Yusuf, 2023). These platforms often include offline capabilities, reducing concerns about inconsistent internet access.

Beyond content, smartphones enable personalized learning. AI-driven platforms can customize instruction to individual goals and provide feedback (Durojaiye, 2021). Online tutoring platforms can connect learners with instructors for real-time sessions. Crucially, using smartphones for literacy also develops digital literacy skills, essential for economic mobility and accessing online services (Umar, 2024).

Despite challenges like limited infrastructure and internet connectivity, successful projects such as the Nigeria Learning Passport, which offers online and offline learning, demonstrate a clear path forward for improving adult literacy rates across the country through smartphone technology (Effiong, 2023).

Roles of Educators and Facilitators in a Mobile-Learning Environment

Mobile learning (m-learning) has revolutionized adult literacy by offering flexibility and accessibility. This shift redefines the roles of educators and facilitators from traditional instructors to guides and support providers, which is crucial for successful m-learning implementation given adult learners' unique challenges like time constraints and varying digital literacy (Traxler, 2007; Woldemariam, 2023).

Educators must adopt innovative pedagogical approaches for mobile devices, creating engaging, bite-sized content like interactive quizzes and multimedia resources instead of simply replicating classroom materials (Ozdamli & Cavus, 2011). They need strong digital literacy to navigate platforms, troubleshoot technical issues, and curate culturally appropriate content (Wang et al., 2022).

Facilitators are vital in supporting adult learners, especially those in under-resourced areas, by building confidence in using mobile devices for learning (Greany, 2024). They provide hands-on assistance, address digital skill gaps, and demonstrate app functionalities. Practical support from facilitators helps learners overcome technological barriers (Thompson, 2011). Beyond technical help, facilitators act as motivators and mentors, offering personalized feedback and encouragement to address adult learners' self-direction and time management challenges (Fogelberg, 2023). Their role in fostering community and providing positive reinforcement significantly impacts learner motivation and self-efficacy.

Ultimately, the success of adult literacy via m-learning depends on educators developing innovative content and facilitators providing essential technical and motivational support. Both roles require digital proficiency, adaptability to adult learning principles, and a commitment to fostering an inclusive learning environment to unlock mobile technology's full potential (Traxler, 2007; Woldemariam, 2023; Ozdamli & Cavus, 2011; Wang et al., 2022; Greany, 2024; Thompson, 2011; Fogelberg, 2023).

Integrating Smartphone Technology into Nigeria's National Adult Literacy Framework Integrating smartphone technology into Nigeria's national adult literacy framework presents a transformative opportunity, yet it necessitates careful policy considerations to ensure equitable and effective implementation. The ubiquity of mobile phones, even basic ones, offers an unprecedented reach for educational content, particularly in remote and underserved areas where traditional literacy programs face logistical hurdles (Adelore & Morakinyo, 2018). Policies must therefore focus on leveraging this widespread access to deliver flexible, self-paced learning opportunities, which are crucial for adult learners often juggling work and family commitments. This includes developing and promoting mobile-friendly literacy applications, digital content in local languages, and platforms that facilitate interactive learning and peer collaboration.

However, the "digital divide" remains a significant policy challenge. Despite the high mobile phone penetration, a substantial portion of Nigerian adults, particularly in rural areas and among lower-income groups, do not own smartphones and lack the necessary digital literacy skills (Awowede, 2025). Policies need to address this foundational gap by initiating programs that provide affordable smartphones or communal access points, alongside comprehensive digital literacy training that goes beyond basic phone usage to encompass internet navigation, online safety, and critical evaluation of digital information. The National Information Technology Development Agency (NITDA)'s "Digital Literacy for All Initiative" (DL4ALL) aiming for 95% digital literacy by 2030 is a commendable step, but its success hinges on robust strategies for inclusive access and skill development (Nairametrics, 2025).

Furthermore, policy must consider the development of relevant and engaging content. Simply porting traditional literacy materials to smartphones is insufficient. The framework should encourage the creation of multimedia-rich, interactive learning modules that are culturally relevant and address the specific needs and interests of adult learners. This requires collaboration between educational bodies, content developers, and local communities. Policies could incentivize the development of such content, perhaps through grants or partnerships with tech companies, ensuring that materials are not only accessible but also effective in fostering sustained literacy.

Another critical policy implication is the training and support for facilitators. Even with advanced technology, human interaction and guidance remain vital in adult education. Literacy educators need to be equipped with the skills to integrate smartphone technology into their teaching methodologies, becoming facilitators of mobile learning rather than just instructors. This includes training on using various educational apps, managing online learning communities, and troubleshooting technical issues. Policies should allocate resources for continuous professional development for adult literacy facilitators, ensuring they are comfortable and proficient in leveraging smartphones to enhance learning outcomes (UNESCO, 2023).

Robust monitoring and evaluation mechanisms are essential to assess the impact of smartphone integration and inform policy adjustments. This involves collecting data on learner engagement, literacy gains, and the challenges encountered. Policies should establish clear metrics and frameworks for evaluating the effectiveness of mobile learning initiatives, allowing for data-driven improvements. Addressing issues like data affordability, network connectivity, and the potential for distractions or addiction associated with smartphone use will require ongoing policy refinement to maximize the benefits of this technology for national adult literacy in Nigeria (Scribd, 2025).

Challenges of Integrating Smartphone Technology into Nigeria's National Adult Literacy Framework

Integrating smartphones into Nigeria's National Adult Literacy Framework faces significant challenges, despite its potential. A primary hurdle is the limited access and affordability of smartphones and data for many adult learners, especially in rural areas (Irielle, 2024). Even with 80% mobile connection penetration by 2024, a considerable portion of illiterate adults may lack the financial means for devices and internet access (Businessday NG, 2025), exacerbating the digital divide.

Another major challenge is the lack of adequate digital literacy skills among both learners and facilitators. Many adult literacy participants have limited prior experience with digital devices, making smartphone-based learning difficult. Adelore and Morakinyo (2018) emphasize that effective integration of mobile technology hinges on addressing foundational digital skills. Similarly, Onuotu and Osiah (2020) note that educators' insufficient exposure to new technology hinders its utilization. Without proper training and ongoing support, the benefits of smartphone integration may not be fully realized, leading to frustration.

Infrastructure limitations, particularly unreliable electricity and patchy internet connectivity, also impede effective integration. Consistent power is crucial for devices like smartphones (Aduwa-Ogiegbaen and Iyamu, 2005). Many remote Nigerian communities experience erratic power, hindering device charging and consistent access to online resources. Despite surging mobile internet usage, significant connectivity gaps persist, especially in rural areas targeted by literacy interventions (Businessday NG, 2025), disrupting learning continuity.

Developing relevant, culturally appropriate, and engaging digital content is another critical challenge. Content must be designed specifically for mobile learning, considering screen size and user interface. Adelore and Morakinyo (2018) stress the need for materials adapted to learners' daily lives and interests. Nigeria's diverse linguistic landscape also necessitates developing materials in various indigenous languages, a resource-intensive endeavor.

Ensuring the sustainability of smartphone-integrated adult literacy programs is a major concern. This includes initial funding for devices and infrastructure, plus ongoing support for content, training, and maintenance. Onyia and Ugwu (2014) highlight insufficient funding as a persistent challenge in technology education. Without robust, sustainable funding and strong policy frameworks, pilot programs may struggle to scale up and impact Nigeria's 59.57% adult literacy rate (Intelpoint, 2025).

Suggestions for Integrating Smartphone Technology into Nigeria's National Adult Literacy Delivery

To address the digital divide and affordability issues, a multi-pronged approach is necessary. Government subsidies or partnerships with mobile network operators could facilitate access to affordable smartphones and data plans tailored for adult learners. Exploring community-based device-sharing initiatives or establishing dedicated learning centers equipped with shared devices could also mitigate the financial burden. Furthermore, leveraging feature phones for basic literacy functionalities, where appropriate, could bridge the gap for those unable to access smartphones.

Overcoming the lack of digital literacy skills requires comprehensive training programs. These programs should be designed for both adult learners and facilitators, starting with foundational digital skills like navigating smartphone interfaces, managing data, and accessing basic online resources. The training should be practical, hands-on, and culturally relevant, perhaps incorporating everyday scenarios. Ongoing support mechanisms, such as helplines or community digital mentors, would ensure continuous learning and problem-solving.

Improving infrastructure is paramount. This involves advocating for increased and stable electricity supply in rural areas, potentially through solar-powered charging stations or community-level mini-grids. Expanding and improving internet connectivity, particularly in underserved regions, is crucial. This could involve government incentives for telecommunication companies to extend their reach, or exploring satellite internet solutions for remote areas where traditional infrastructure is challenging.

Developing and curating relevant digital content demands a collaborative effort. This involves instructional designers, linguists, and adult literacy experts. Content should be interactive, gamified, and localized to reflect the diverse Nigerian cultures and languages. Open Educational Resources (OERs) could be adapted and translated. User-centered design principles should be applied to ensure the content is intuitive and engaging for adult learners with varying levels of digital literacy.

Ensuring sustainability requires a robust funding model and strong policy frameworks. Diversifying funding sources beyond government allocations, including private sector partnerships, grants, and international aid, is essential. Clear government policies on digital literacy integration, coupled with institutional support from educational bodies, would provide the necessary framework for long-term program success. Regular monitoring and evaluation are also vital to identify challenges and adapt strategies for continuous improvement.

Conclusion

The integration of smartphones into Nigeria's adult literacy framework presents a transformative opportunity to overcome long-standing challenges and foster a more literate, empowered, and digitally inclusive nation. By leveraging the widespread adoption of mobile technology, Nigeria can significantly enhance access to learning, personalize educational experiences, and empower adult learners with essential digital skills.

This paper has explored the multifaceted potential of smartphones in revolutionizing adult literacy development in Nigeria, from offering flexible learning environments and diverse educational content to fostering peer-to-peer interaction and supporting self-directed learning. The paper has examined existing initiatives, identified best practices, and proposed innovative strategies for seamless integration. While challenges such as the digital divide, lack of digital literacy, and infrastructure limitations persist, proactive policy interventions, robust funding, and collaborative efforts among stakeholders can mitigate these hurdles. Ultimately, embracing smartphone technology in adult literacy is not merely an option but a crucial step towards equipping Nigerian adults with the foundational skills necessary for socio-economic empowerment and national development in the 21st century.

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