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# TECHNOLOGY-DRIVEN INTERVENTION FOR OUT-OF-SCHOOL CHILDREN IN NIGERIA: EXPLORING CHALLENGES AND PROSPECTS

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**Abstract**

Nigeria has one of the largest populations of out-of-school children (OOSC) globally, with estimates ranging from 11 to 17 million, most of whom live in Northern and rural areas. Persistent poverty, insecurity, gender disparities and inadequate infrastructure continue to restrict access to basic education. This study examined how technology can be leveraged to empower out-of-school children by addressing structural barriers and expanding digital opportunities. Using a secondary data empirical design, the study analyzed datasets and reports from national and international agencies. Descriptive statistical and thematic analyses were applied to assess trends in school exclusion, digital access and policy responses. Findings indicate that over 60% of out-of-school children are concentrated in Northern states, with rural exclusion rates (about 31%) far higher than urban rates (around 10%). Girls remain disproportionately affected in several regions. Although mobile phone penetration is relatively high, limited rural broadband connectivity, unreliable electricity and high internet costs constrain digital learning initiatives. While policies increasingly promote ICT integration and broadcast learning programs have improved access during disruptions, implementation gaps remain. The study concluded that technology has strong potential to empower out-of-school children (OOSC) in Nigeria by expanding access to flexible and inclusive learning opportunities. It recommends that the government should partner with NGOs and technology companies to invest in Rural Digital Infrastructure and address socio-cultural barriers limiting girls' participation and ensure inclusion of children with disabilities and displaced learners, while improving data systems and enhancing collaboration among government agencies, NGOs and development partners to ensure sustainable implementation.

**Keywords:** Out-of-school children, educational technology, digital-driven, Intervention, ICT integration

## Introduction

The role of technology and digital revolution has become increasingly significant in this 21st century, altering how teaching and learning are conceptualized and delivered across the world. Nigeria continues to face a persistent challenge of educational exclusion, with millions of school-age children remaining outside the formal education system despite ongoing reforms and increased policy attention. Estimates indicate that approximately 17–18 million children aged 6–15 years are out of school, with a disproportionate concentration in Northern Nigeria (UNICEF, 2023; National Bureau of Statistics [NBS], 2022). This situation is driven by a complex mix of structural and contextual factors, including poverty, insecurity, early marriage, gender inequality, weak educational infrastructure, and socio-cultural norms that limit school participation (World Bank, 2020; UNESCO, 2022). The Boko Haram insurgency and related insecurity in the North East have further intensified school closures and forced displacement, worsening educational exclusion in already vulnerable communities (Akorede et al., 2022; UNICEF, 2023).

Technology-driven interventions have emerged as a promising strategy for expanding access to education in response to these challenges and Technology is increasingly reshaping teaching and learning globally (Abdulbaqi et al., 2025; Boor et al 2026). The rapid diffusion of mobile technologies, increasing internet penetration, and the availability of solar-powered learning devices, offline digital platforms (Microsoft Teams) and educational radio and television broadcasts have created new opportunities for reaching marginalized learners (International Telecommunication Union [ITU], 2022; UNESCO, 2022). During the COVID-19 pandemic, Nigeria adopted radio and television-based instruction as emergency learning solutions, demonstrating the potential of alternative delivery systems in low-connectivity environments (Universal Basic Education Commission [UBEC], 2021).

Similarly, emerging digital learning platforms and blended education models have shown potential for supporting flexible, self-paced, and inclusive learning pathways for out-of-school children. Nevertheless, despite these promising developments, significant challenges continue to limit the effectiveness of technology-driven interventions. These include inadequate digital infrastructure, unreliable electricity supply, high cost of internet data and devices, limited teacher digital competence, and weak institutional coordination (World Bank, 2020; ITU, 2022).

In rural and conflict-affected regions, these constraints are more severe, further deepening the digital divide and limiting equitable access to learning opportunities. In addition, socio-cultural resistance and low levels of digital literacy among parents and communities continue to affect the acceptance and sustainability of technology-based education initiatives (UNESCO, 2022). Beyond access, the concept of educational empowerment is central to understanding the role of technology in addressing the OOSC crisis. Empowerment in this context refers not only to access to digital tools but also to the development of learners' capabilities, agency, and participation in social and economic life (UNESCO, 2022). Technology, when effectively integrated into education systems, can support catch-up learning, re-entry into formal schooling, and acquisition of relevant skills for future employment. This is particularly important for marginalized groups such as girls, children in rural communities, nomadic populations, and those affected by conflict (UNICEF, 2023).

This study therefore, examines the challenges and prospects of technology-driven interventions for out-of-school children in Nigeria. It situates digital education within broader socio-economic and infrastructural realities and argues that while technology presents significant opportunities for inclusion, its effectiveness depends on addressing systemic barriers such as infrastructure deficits, affordability constraints, and socio-cultural limitations. By exploring these dynamics, the study contributes to ongoing policy debates on sustainable and inclusive strategies for reducing educational exclusion in Nigeria (World Bank, 2020; UNESCO, 2022).

**Statement of the Problem**

Nigeria faces one of the largest out-of-school children (OOSC) crises globally, with an estimated 17–18 million children affected and the burden heavily concentrated in Northern regions (UNICEF, 2023; National Bureau of Statistics [NBS], 2022). Despite sustained policy efforts such as the Universal Basic Education programme and interventions by UBEC and development partners, educational exclusion persists due to poverty, insecurity, displacement, gender inequality, early marriage, child labour, weak infrastructure, and socio-cultural norms (World Bank, 2020; UNESCO, 2022). The Boko Haram insurgency has further intensified school disruptions in Northern Nigeria, deepening disparities in access to education (UNICEF, 2023).

Concurrently, Nigeria is experiencing rapid digital expansion, including increased mobile penetration, emerging e-learning platforms, solar-powered solutions, and growing internet connectivity (International Telecommunication Union [ITU], 2022). These developments present potential pathways for extending learning opportunities beyond conventional classrooms. However, evidence remains limited on how effectively such technologies are being harnessed to address the needs of OOSC, particularly in rural and conflict-affected communities. Key constraints include infrastructural deficits, affordability challenges, low digital literacy, and weak implementation capacity (World Bank, 2020; UNESCO, 2022).

This study, therefore, examines the challenges and prospects of technology-driven interventions for empowering out-of-school children in Nigeria within a context of deepening educational inequality and emerging digital opportunities. The problem, therefore, lies in the gap between the potential of technology-driven interventions and their actual effectiveness in addressing the educational needs of OOSC in Nigeria. This gap raises concerns about the challenges limiting implementation as well as the prospects for improving the use of technology to enhance access to learning. Consequently, there is a need to systematically examine the challenges and prospects associated with technology-driven interventions for out-of-school children in Nigeria.

**Research Objectives**

This study was conducted to achieve the following objectives:

1. Examine the distribution and magnitude of out-of-school children (OOSC) in Nigeria across regional, rural–urban, and gender dimensions.

2. Assess the influence of digital infrastructure and connectivity factors (internet access, broadband availability, affordability, and electricity) on access to technology-driven learning opportunities in Nigeria.
3. Evaluate the extent to which technology-based educational interventions (including ICT integration, radio/television learning, and digital platforms) address the challenges of out-of-school children in Nigeria.

**Research Questions**

1. What is the distribution and magnitude of out-of-school children (OOSC) in Nigeria across regional, rural–urban, and gender dimensions?
2. To what extent do digital infrastructure and connectivity factors (internet access, broadband availability, affordability, and electricity) influence access to technology-driven learning opportunities in Nigeria?
3. To what extent have technology-based educational interventions (e.g., ICT integration, radio/TV learning, and digital platforms) addressed the challenges of out-of-school children in Nigeria?

**Conceptual Framework**

This study is anchored on an integrated framework that links Technology Access and Utilization, Contextual Barriers and Child Empowerment Outcomes within the broader Nigerian educational ecosystem. The framework draws conceptually from the Capability Approach (expansion of individual freedoms and opportunities), Digital Inclusion theory (equitable access and meaningful use of ICTs) and Ecological Systems perspectives (influence of socio-cultural and institutional environments). It positions technology not as an end in itself, but as a mediating tool that can expand children's capabilities when embedded within supportive structures.

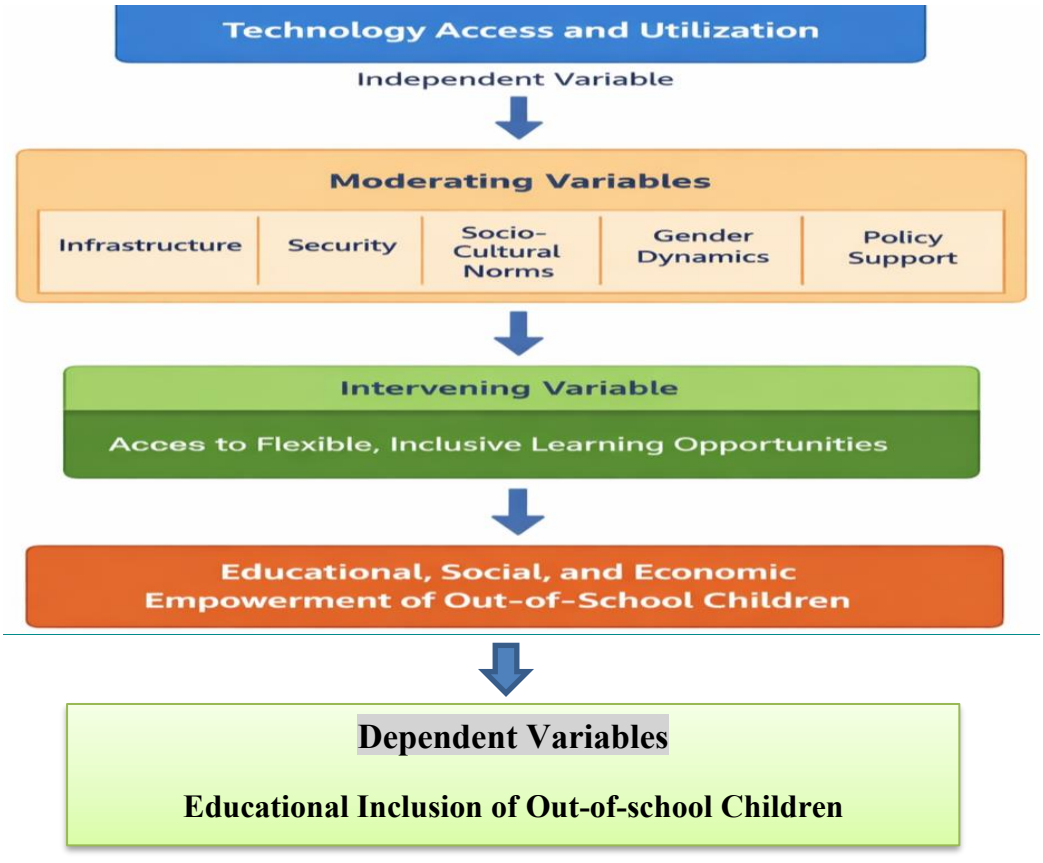



**Figure 1. Conceptual Framework (Source: Awolusi, 2026)**

**Technology Access and Utilization**

Technology access and utilization constitute the primary independent variable in this framework. In the context of out-of-school children (OOSC) in Nigeria, access goes beyond the mere availability of devices such as mobile phones, tablets, computers, radios and televisions. It also includes connectivity infrastructure, reliable electricity

supply, affordability of data services and supportive institutional systems (World Bank, 2020; ITU, 2022). Access without meaningful use does not automatically translate into learning gains. Therefore, utilization emphasizes sustained and purposeful engagement with technological tools for educational objectives, including the ability to navigate digital platforms, interact with instructional content and apply acquired knowledge to real-life contexts (UNESCO, 2021).

In northern Nigeria, where many rural and conflict-affected communities experience unstable electricity and weak broadband penetration, alternative solutions such as solar-powered devices, offline digital platforms, and radio-based instruction become particularly relevant (World Bank, 2020). Utilization also depends on digital literacy competencies among learners, facilitators and caregivers, as well as the availability of localized, curriculum-aligned and language-appropriate content (UNESCO, 2021). Thus, technology in this study is conceptualized not as isolated gadgets but as an integrated ecosystem of hardware, software, connectivity, energy systems, human capacity and governance mechanisms that collectively expand educational opportunities beyond conventional classroom settings.

Understanding technology access must be situated within the realities of OOSC in Nigeria. OOSC includes children who have never enrolled in school, those who dropped out prematurely and those in non-formal settings whose learning outcomes remain below expected standards. Nigeria continues to record one of the highest OOSC populations globally, with Northern states disproportionately affected. These children include girls excluded due to early marriage and domestic responsibilities, children displaced by insurgency in Borno, Yobe and Adamawa, nomadic and pastoralist children with seasonal mobility patterns, children in remote rural communities lacking infrastructure, children with disabilities facing exclusion and children from impoverished households unable to bear schooling costs. In many Northern communities, socio-cultural norms, gender disparities and insecurity intersect to compound educational exclusion.

The consequences of exclusion are multidimensional. Educational deprivation results in low literacy and numeracy, limited life skills and restricted access to further education or vocational pathways. Socially, exclusion increases vulnerability to exploitation, child labour and marginalization. Economically, it diminishes lifetime earning potential and productivity, thereby perpetuating intergenerational poverty. At the national level, high OOSC rates undermine social cohesion, gender equity, economic growth and long-term stability. Addressing these challenges requires context-sensitive technological interventions grounded in accurate data regarding enrolment, connectivity, language diversity, disability, gender norms and household socioeconomic conditions. Without such evidence, digital initiatives risk misdirected investment and reinforcement of existing inequalities.

The root causes of OOSC in Northern Nigeria are deeply interconnected. Poverty remains a central driver, as families struggle with direct and indirect educational costs and opportunity costs associated with child labour (NBS, 2022). Cultural and gender norms restrict girls' schooling, while insecurity and conflict disrupt educational infrastructure and displace communities (UNICEF, 2023). Infrastructure gaps such as inadequate classrooms, teacher shortages, limited water and sanitation facilities, poor road access and unreliable electricity further weaken schooling systems. Governance challenges, uneven policy implementation and insufficient funding exacerbate these structural constraints. Consequently, technological interventions must be embedded within broader educational reform strategies to break cycles of deprivation.

**The Relationship between Technology Access and Empowerment**

The relationship between technology access and empowerment is not automatic; it is mediated by contextual and moderating variables that shape outcomes. Infrastructure forms the foundational layer. Without reliable electricity, network coverage, transportation and safe learning environments, digital interventions cannot function effectively (World Bank, 2020). Many rural Northern communities face chronic infrastructure deficits that limit the scalability and sustainability of technology-based programmes (NBS, 2022). Security conditions also significantly moderate the impact. In conflict-affected regions, insurgency, displacement and fear of attacks disrupt both traditional schooling and technology-enabled learning (UNICEF, 2023). Under such conditions, flexible and portable learning solutions such as radio broadcasts, offline devices and mobile learning hubs become essential. Socio-cultural norms further influence acceptance and participation. Perceptions of Western-style education, religious considerations and community attitudes toward technology may affect adoption rates. Gender dynamics

are particularly critical; girls often face restricted mobility, early marriage and limited access to devices, making gender-responsive programme design imperative (UNESCO, 2022).

Policy support is another crucial moderator. Government commitment, regulatory clarity, funding allocation and institutional coordination determine whether digital initiatives remain short-term pilot projects or evolve into sustainable systems (Federal Ministry of Education, 2019). Collaboration with agencies such as the Universal Basic Education Commission and international development partners strengthens oversight, financing and monitoring mechanisms. Household income further mediates participation. Low-income families may lack resources to purchase devices or pay for connectivity and children may prioritize income-generating activities over learning (NBS, 2022). Within this moderated environment, technology can create pathways to empowerment when aligned with inclusive delivery mechanisms. Radio and television instruction have demonstrated effectiveness in crisis settings, particularly during school closures. Mobile phone–based platforms, such as SMS, WhatsApp groups, and interactive voice response, capitalize on relatively high mobile penetration. Offline digital content supported by solar solutions expands reach in low-connectivity zones. Community learning centers offering blended approaches can integrate technology with human facilitation. Moreover, teacher training, monitoring systems and localized content in Hausa, Fulfulde, Kanuri and other languages enhance relevance and engagement.

However, sustainability challenges remain. Device maintenance, software updates, digital literacy training and long-term funding must be addressed to prevent project collapse. There is also a risk of widening digital divides if interventions primarily benefit urban or male learners. Therefore, policy alignment, public–private partnerships and strong community ownership are essential to ensure equitable impact.

**Educational, Social and Economic Empowerment**

The outcome of this framework is the empowerment of OOSC, conceptualized as the expansion of capabilities, agency and life opportunities (Sen, 1999). Educational empowerment entails improvements in foundational literacy, numeracy, digital competence, critical thinking and lifelong learning skills necessary for reintegration into formal schooling or progression into vocational pathways (UNESCO, 2021). For many Northern OOSC, this begins with remedial instruction in familiar local languages before bridging to mainstream curricula.

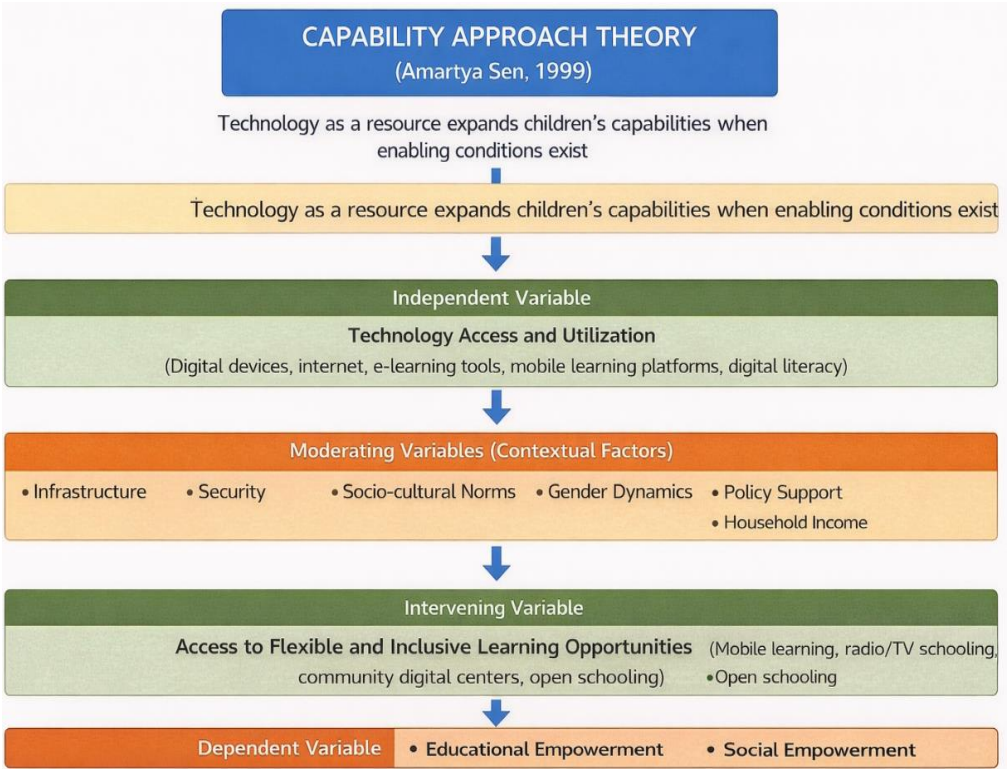
Social empowerment encompasses increased confidence, agency, inclusion and participation in community life. Access to technology-mediated learning can challenge restrictive gender norms, promote girls' education and foster broader social inclusion (UNICEF, 2023; UNESCO, 2022). It can also facilitate awareness of rights, health information and civic responsibilities, strengthening community engagement. Psychological empowerment, building resilience, motivation and self-belief are equally important, particularly for children affected by conflict or prolonged exclusion (Akorede et al., 2021).

Economic empowerment arises when children acquire skills that enhance employability and income-generation prospects. Digital literacy, vocational competencies and entrepreneurial skills contribute to long-term economic participation, particularly in contexts with limited formal employment opportunities (World Bank, 2020). In aggregate, these outcomes contribute to poverty reduction, social stability and national development.

**Theoretical Framework**

**Capability Approach Theory**

This study is anchored on the Capability Approach Theory by Amartya Sen (1999), which conceptualizes development as the expansion of individuals' freedoms and capabilities. Out-of-school children in Northern Nigeria, technology is viewed not merely as a resource but as a means of enhancing children's educational, social and economic capabilities. The theory provides a lens for examining how access to digital tools, when supported by enabling contextual factors, can translate into meaningful empowerment outcomes.




**Source: (Develop, Amartya Sen (1999)**

**Methodology**

This study adopted a secondary data-based empirical research design to examine national trends in education and digital access in Nigeria, focusing on out-of-school children (OOSC) and technology-driven interventions. Secondary data were obtained from reputable sources, including the National Bureau of Statistics (NBS), UNICEF, UNESCO, the World Bank, the International Telecommunication Union (ITU), and the Universal Basic Education Commission (UBEC), alongside policy documents and peer-reviewed literature. Data collection involved identifying relevant indicators (that is., OOSC rates and digital access), extracting recent datasets (2020–2023), cross-verifying information across sources, and organizing data into thematic categories. Reliability was ensured through data triangulation and the use of standardized, peer-reviewed datasets, while validity was achieved by selecting appropriate indicators and up-to-date data. Descriptive statistical techniques, including frequencies, percentages, and comparative analysis, were used for data analysis, with results presented in tables. Additionally, qualitative content analysis was employed to interpret policy documents and institutional reports. The study focused on trend analysis and macro-level insights; thus, inferential statistics were not applied.

**Results**

**Out-of-School Children and Digital Access in Nigeria**

**Table 1: National Out-of-School Children Indicators**

| Indicator | Value |
|---|---|
| Estimated Out-of-School Children (5–14 years) | 11–17 million |
| Share of OOSC in Northern Nigeria | Over 60% |
| Rural OOSC Rate | ~31% |
| Urban OOSC Rate | ~10% |
| Girls not attending basic education (selected northern zones) | Over 50% |

**Source:** National Bureau of Statistics (2022); United Nations Children's Fund (2023); World Bank (2020).

The above Table 1 presents national indicators on the scale and distribution of out-of-school children in Nigeria. The data show that between 11 and 17 million children of primary and junior secondary school age remain outside

formal education, placing Nigeria among the countries with the highest OOSC burden globally. The majority of these children reside in Northern regions, where poverty, insecurity and socio-cultural norms limit school participation. The rural–urban gap is significant, with rural exclusion rates nearly three times higher than urban rates. Furthermore, gender disparities remain pronounced in parts of Northern Nigeria, where more than half of eligible girls are not attending basic education.

These findings suggest that the OOSC crisis is not merely an access problem but a structural development challenge. The concentration of exclusion in rural and conflict-affected zones implies that traditional school-based solutions alone may be insufficient. Technology-enabled learning pathways, therefore emerge as potentially transformative alternatives, particularly in geographically and socially marginalized communities.

**Digital Infrastructure and Connectivity Gaps**

**Table 2: Digital Access and Connectivity Indicators in Nigeria**

| Indicator | Status |
|---|---|
| Internet penetration | Moderate but uneven |
| Rural broadband access | Low |
| Affordability of broadband | Constrained for low-income households |
| Electricity access in rural areas | Limited |
| Mobile phone penetration | High but not universal |

**Source:** International Telecommunication Union (2022); World Bank (2020).

The above Table 2 highlights key digital infrastructure indicators relevant to technology-based learning. Although Nigeria has experienced growth in mobile phone penetration and internet adoption, access remains uneven and highly stratified. Rural broadband coverage is limited and affordability remains a major barrier for low-income households. Electricity shortages further constrain consistent digital usage, particularly in remote Northern communities.

These connectivity gaps directly affect the feasibility of digital education interventions. Without reliable infrastructure, the potential of e-learning platforms, online classrooms and digital content delivery cannot be fully realized. Therefore, while technology presents opportunities for inclusion, infrastructural deficiencies pose serious constraints that must be addressed to avoid widening the digital divide.

**Technology and Basic Education Reform Efforts**

**Table 3: Technology and Education Reform Indicators**

| Indicator | Observation |
|---|---|
| Government recognition of ICT in education | Present in policy frameworks |
| Use of radio/TV learning during disruptions | Implemented |
| Integration of digital learning initiatives | Emerging but limited |
| Global emphasis on technology in education | Strong policy advocacy |

**Source:** Universal Basic Education Commission (2021); United Nations Educational, Scientific and Cultural Organization (2022).

The above Table 3 presents institutional responses to educational exclusion through technology integration. The data indicate that Nigeria has recognized the role of ICT in education reform, particularly during school disruptions such as the COVID-19 pandemic, when radio and television learning initiatives were deployed. Policy frameworks increasingly emphasize digital integration; however, implementation remains uneven and constrained by funding and infrastructure gaps.

These findings revealed that technology is already positioned as a complementary tool within Nigeria's education reform agenda. However, the scale of deployment does not yet match the magnitude of the OOSC crisis. While global policy discourse, as reflected in UNESCO reports, strongly advocates technology as a driver of inclusion, successful outcomes depend on contextual adaptation, sustained financing and equitable access mechanisms.

**Implication of the Study**

The findings underscore the urgent need for scalable and alternative learning delivery models, particularly technology-enabled solutions, to address the growing challenge of educational exclusion. Technology-based flexible learning approaches present significant potential for supporting displaced and marginalized children who are unable to access formal classroom settings. However, the effective implementation of such models requires substantial investment in digital infrastructure, teacher capacity building, and the adoption of inclusive design principles that accommodate diverse learner needs. In this context, mobile technologies and offline-compatible platforms emerge as viable pathways for extending learning opportunities to remote and underserved populations. Nevertheless, there is a risk that the digital divide may further exacerbate existing inequalities if issues related to affordability and access are not adequately addressed. Consequently, broadcast and blended learning models remain practical and effective strategies for reaching out-of-school children in low-connectivity environments.

**Discussion of Findings**

**Out-of-School Children and Digital Access in Nigeria:** The findings reveal a substantial and uneven distribution of out-of-school children (OOSC) in Nigeria, with an estimated 11–17 million children aged 5–14 years excluded from formal education. This positions Nigeria among countries with the highest OOSC burden globally and reflects a systemic pattern of educational exclusion rather than isolated access limitations. This finding is consistent with reports by the UNICEF (2022) and the World Bank (2023), which identify Nigeria as having one of the largest populations of OOSC worldwide. The concentration of over 60% of these children in Northern Nigeria corroborates the findings of UNESCO (2022), which attributes regional disparities in school participation to poverty, insecurity, and socio-cultural practices such as early marriage and child labour.

Furthermore, the significantly higher OOSC rate in rural areas (approximately 31%) compared to urban areas (about 10%) supports the assertions of the UNESCO Institute for Statistics (2021), which highlights persistent rural–urban inequalities in access to education across developing countries. The finding that more than half of girls in selected Northern zones are not enrolled in basic education aligns with studies by UNICEF (2022) and World Bank (2023), which emphasize the gendered dimensions of educational exclusion in Northern Nigeria. These patterns suggest that educational marginalization in Nigeria is deeply structural and geographically concentrated. Consequently, the findings support the argument by Bozkurt et al. (2023) that alternative and flexible learning pathways, particularly technology-enabled solutions, are essential for reaching underserved and vulnerable populations.

**Digital Infrastructure and Connectivity Gaps:** The study further indicates that, although Nigeria has recorded moderate growth in internet penetration and high levels of mobile phone adoption, access to digital infrastructure remains uneven and socially stratified. This observation is supported by International Telecommunication Union (2022), which reports significant disparities in broadband access between urban and rural areas in developing countries. The limited availability of rural broadband and the high cost of internet services are also consistent with findings by the World Bank (2023), which notes that affordability remains a major barrier to digital inclusion in sub-Saharan Africa.

In addition, unreliable electricity supply in rural and remote areas significantly constrains the effective use of digital technologies for learning. This aligns with the work of Aker and Mbiti (2019), who argue that infrastructural deficits, particularly in power supply, limit the developmental impact of digital technologies in Africa. The findings therefore suggest that mobile phone penetration alone is insufficient to ensure meaningful engagement in digital learning without complementary infrastructure such as stable electricity and affordable broadband. This supports the argument by Hilbert (2016) that the digital divide extends beyond access to devices and includes disparities in quality, affordability, and usability of digital resources. Consequently, the persistence of these infrastructural gaps poses a significant risk of widening educational inequality if not addressed through targeted investments.

**Technology and Basic Education Reform Efforts:** The findings further demonstrate that Nigeria has made institutional progress in integrating information and communication technology (ICT) into education policy frameworks, particularly through the adoption of radio and television-based instructional delivery during the COVID-19 pandemic. This is consistent with global observations by UNESCO (2021), which reported widespread

use of broadcast media as an alternative learning platform during school closures. Such initiatives reflect a growing recognition of technology as a viable tool for expanding educational access.

However, the integration of digital learning within Nigeria's basic education system remains at an emergent stage, revealing a gap between policy formulation and effective implementation. This finding is supported by Trucano (2016), who notes that many developing countries face challenges in translating ICT-in-education policies into practice due to funding constraints and limited technical capacity. Similarly, Tondeur et al. (2021) emphasize that effective technology integration requires not only policy commitment but also sustained investment in infrastructure, teacher capacity, and institutional support.

Moreover, the effectiveness of broadcast-based learning (radio and television) in expanding access during crises aligns with findings by Dreesen et al. (2020), who highlight the scalability of low-technology solutions in low-connectivity environments. Nevertheless, achieving long-term impact requires coordinated implementation, increased funding, and the development of digital competencies across the education sector. Overall, the findings underscore the need for a holistic and context-sensitive approach to technology integration in Nigeria's basic education system.

**Conclusion**

This study found that technology has strong potential to empower out-of-school children (OOSC) in Nigeria by expanding access to flexible and inclusive learning opportunities. Evidence from sources such as the World Bank, United Nations Children's Fund and United Nations Educational, Scientific and Cultural Organization shows that digital tools, including mobile learning, radio and television education can improve access to education, especially in marginalized and conflict-affected regions. However, the impact of technology is constrained by infrastructure gaps, insecurity, poverty, gender inequality and weak policy coordination. Technology alone does not guarantee empowerment; its effectiveness depends on supportive systems, inclusive implementation and equitable access. When properly integrated, technology can enhance educational attainment, social inclusion and long-term economic opportunities for vulnerable children.

**Recommendations**

1. Invest in Rural Digital Infrastructure (Government & Development Partners): the government and development partners should prioritize expansion of rural connectivity, stable power (including solar solutions) and affordable broadband.
2. Ensure Affordable Access to Digital Devices (Government, NGOs & Private Sector): Considering that poverty and affordability constraints limit access to digital tools, stakeholders should provide subsidized devices and establish community digital learning centers. This responds directly to findings on low-income barriers and uneven mobile/internet access, particularly in marginalized communities.
3. Adopt Blended and Flexible Learning Models (Government, NGOs & Education Providers): Radio and television learning should be successfully deployed during disruptions and education providers should scale blended approaches combining mobile, radio, TV, and offline platforms to reach children in low-connectivity and conflict-affected areas.
4. Promote Gender-Responsive and Inclusive Policies (Government & NGOs): targeted interventions are needed to address socio-cultural barriers, support girls' participation and ensure inclusion of displaced children and learners with disabilities.
5. Strengthen Monitoring and Coordination (Government, NGOs & Development Partners): stakeholders should strengthen data systems, monitoring frameworks, and inter-agency coordination to ensure that technology-driven interventions are effectively scaled and sustained. implementation.

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