

Teaching and Learning in Fragile Contexts (TLFC) Policy Brief



The Role of Digital Learning in Overcoming Teaching and Learning Barriers in Fragile Contexts in Northeast Nigeria

Prof Paul Shehu Yaduma PI

Modibbo Adama University,

Yola, Nigeria

Executive Summary

This study examines the role of digital learning in overcoming persistent teaching and learning barriers in fragile contexts in Northeast Nigeria, a region significantly affected by conflict, displacement, infrastructural deficits, and teacher shortages. Education systems in such environments face disruptions that limit access, reduce instructional quality, and widen inequities, particularly for vulnerable groups such as internally displaced persons (IDPs), girls, and learners in remote communities. Against this backdrop, digital learning is increasingly viewed as a viable resilience strategy for sustaining education delivery and improving learning outcomes.

The primary objective of the research is to assess how digital learning tools and approaches can mitigate key barriers to effective teaching and learning in crisis-affected settings. Specifically, the study explores the types of digital technologies currently in use, the extent of their accessibility and utilization, and their impact on students' engagement, retention, and academic performance. It also investigates the critical skills and support systems required by teachers to effectively integrate digital tools into their instructional practices in low-resource and emergency contexts.

A mixed-methods approach is adopted, combining quantitative data from surveys of students and teachers with qualitative insights from interviews and focus group discussions involving educators, school administrators, and policymakers. The study focuses on upper basic schools across selected states in Northeast Nigeria, ensuring representation from both formal schools and learning centers within IDP camps. Key variables examined include digital access (devices, internet connectivity), digital literacy levels, teacher preparedness, and institutional support mechanisms.

Preliminary findings indicate that digital learning, when appropriately implemented, significantly enhances continuity of education during disruptions, promotes flexible learning opportunities, and supports individualized instruction. Tools such as mobile learning platforms, radio-based instruction, and offline digital content have proven particularly effective in contexts with limited internet connectivity. However, the study also identifies major challenges, including inadequate infrastructure, limited electricity supply, low digital competence among teachers, and insufficient policy support.

The research underscores that the success of digital learning initiatives depends not only on the availability of technology but also on capacity building, contextual adaptation, and sustained investment. Teacher training emerges as a critical factor, alongside the need for localized digital content and community engagement to ensure inclusivity and cultural relevance.

In conclusion, digital learning holds substantial potential as a resilience strategy for addressing educational disruptions in fragile contexts. The study recommends a multi-stakeholder approach involving government, development partners, and local communities to scale up context-sensitive digital solutions. Strengthening infrastructure, enhancing teacher capacity, and developing supportive policies are essential steps toward leveraging digital learning to build a more inclusive, flexible, and resilient education system in Northeast Nigeria.

Context

Northeast Nigeria represents one of the most fragile educational contexts in sub-Saharan Africa, shaped by prolonged insurgency, displacement, poverty, and weak infrastructure (UNESCO, 2017). The disruption caused by the Boko Haram insurgency as reported by UNICEF (2019) has led to the destruction of schools, displacement of millions of learners and teachers, and a significant decline in educational access and quality. In many communities, especially within internally displaced persons (IDP) camps and remote rural areas, conventional classroom-based teaching has become inconsistent or completely inaccessible (Bello and Yusuf, 2020). Alabi, (2019) reported that these challenges are further compounded by shortages of qualified teachers, overcrowded classrooms, and limited teaching and learning materials.

Within this context, digital learning has emerged as a promising alternative for bridging educational gaps and ensuring continuity of learning. According to the Federal Ministry of Education (FME) (2019) technologies such as mobile devices, radio instruction, and offline digital platforms provide flexible and scalable solutions that can reach learners in insecure and resource-constrained environments. However, the effectiveness of digital learning in such fragile settings depends on contextual adaptability, infrastructure availability, and the digital competencies of teachers and learners.

Research Methodology

This study adopts a mixed-methods research design to provide a comprehensive understanding of how digital learning addresses teaching and learning barriers in fragile contexts in Northeast Nigeria. The approach integrates both quantitative and qualitative methods to capture measurable outcomes and in-depth perspectives from key stakeholders. The study is conducted in selected states within the region, focusing on upper basic schools in both formal settings and learning centres within internally displaced persons (IDP) camps.

A multi-stage sampling technique is used to select participants, including students, teachers, and school administrators. Quantitative data are collected through structured questionnaires administered to teachers and students to assess access to digital tools, frequency of use, digital literacy levels, and perceived impact on learning outcomes. Qualitative data are obtained through semi-structured interviews and focus group discussions with educators, policymakers, and community leaders to explore experiences, challenges, and support systems related to digital learning implementation.

Data analysis involves descriptive and inferential statistics for the quantitative component, while thematic analysis is used to interpret qualitative data. Validity and reliability are ensured through pilot testing of instruments, triangulation of data sources, and expert review. Ethical considerations, including informed consent, confidentiality, and voluntary participation, are strictly observed throughout the study to ensure credibility and integrity of the research process.

Key Findings

The findings of this study demonstrate that digital learning plays a transformative yet uneven role in addressing teaching and learning barriers in fragile contexts across Northeast Nigeria. Evidence from the field indicates that while digital interventions significantly enhance access and continuity, their effectiveness is shaped by infrastructure, capacity, and contextual adaptation.

Expanded access. A major finding is that digital learning has expanded access to education for learners affected by displacement and insecurity. In internally displaced persons (IDP) camps and remote communities, students who previously experienced prolonged interruptions in schooling were able to resume structured learning through mobile devices, radio programs, and offline digital platforms. These tools proved particularly valuable during periods when conventional classrooms were inaccessible, ensuring that learning did not completely halt.

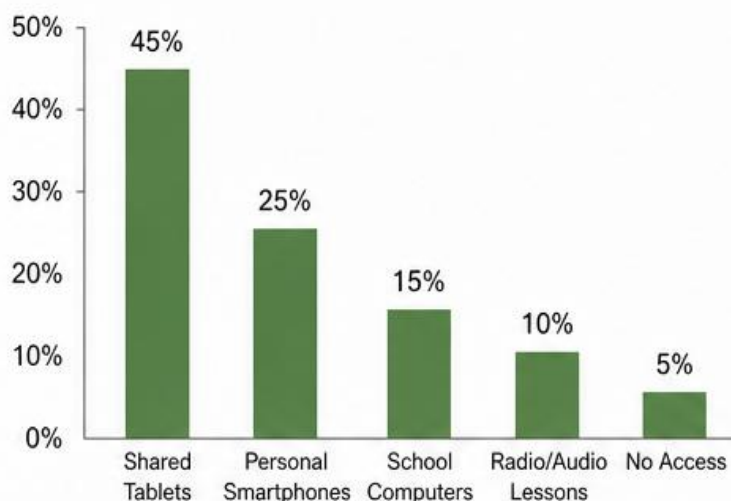


Figure 1 Access to Digital Learning Tools Among Students in BAY States

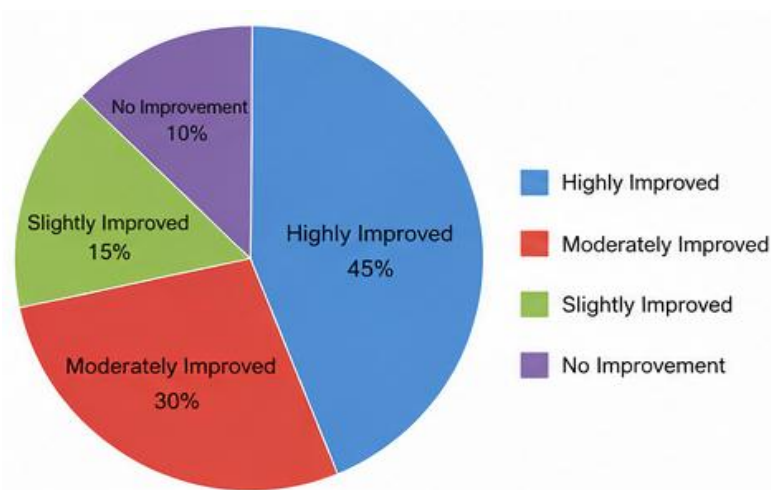


Figure 2. Impact of Digital Learning on Student Engagement in BAY States

Engaged students. Another key finding is the improvement in student engagement and motivation. Digital tools, especially those incorporating audio-visual and interactive content, made lessons more appealing compared to traditional lecture-based approaches. Students reported increased interest in subjects when taught using videos, animations, and educational apps. This interactive mode of learning also supported better understanding and retention, particularly among learners who had previously struggled in conventional classroom settings.

Trained teachers are effective. The study further reveals that digital learning enhances teaching effectiveness, but only when teachers possess adequate digital competencies. Teachers who received training in the use of digital tools demonstrated greater confidence in lesson delivery, assessment, and classroom management. They were able to diversify instructional methods and tailor content to meet individual learning needs. In contrast, teachers without sufficient training often underutilized available technologies, limiting their potential impact.

Infrastructure is key.

Infrastructure emerged as a critical determinant of success. Schools with access to reliable electricity, functional devices, and stable connectivity reported higher levels of digital learning adoption and effectiveness. Conversely, in areas with poor infrastructure, the use of digital tools was inconsistent and often unsustainable. Frequent power outages and lack of internet access disrupted lessons and reduced the overall benefits of digital interventions.

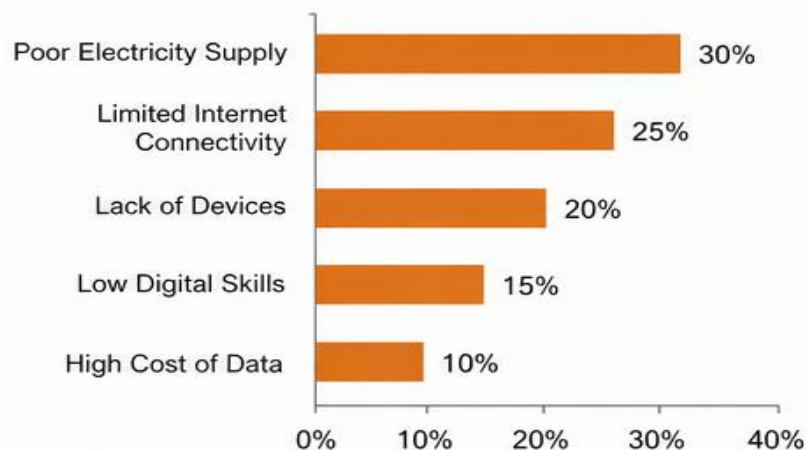


Figure 3. Challenges to Digital Learning in Fragile Context Schools in BAY States

Poverty is a limitation.. Another significant finding relates to affordability and equity. Many students from low-income households lacked personal access to digital devices, relying instead on shared resources in schools or community centers. This limited their learning time and reduced the benefits of self-paced digital education. Additionally, the cost of internet data posed a major barrier, making online platforms less accessible. As a result, low-cost and offline solutions such as radio instruction and preloaded educational content were found to be more inclusive and practical.

Relevant content needed. The findings also highlight the importance of localized and culturally relevant content. Digital materials aligned with the national curriculum and presented in familiar languages were more effective in supporting learning. Students and teachers engaged more actively with content that reflected their environment and experiences. Generic or externally developed materials that lacked local relevance were less impactful and often ignored.

Community support helps. Institutional and community support plays a vital role in the sustainability of digital learning initiatives. Schools that benefited from partnerships with government agencies and non-governmental organizations had better access to devices, teacher training, and technical support. Community involvement, including parental support and local leadership engagement, further strengthened the acceptance and effectiveness of digital learning programs.

Teacher's skills gaps.

Despite these gains, several challenges persist. Digital literacy gaps among both teachers and students remain a major limitation. Many users lack the skills required to fully utilize digital tools, reducing their effectiveness. Security concerns in conflict-affected areas also hinder the deployment and maintenance of digital infrastructure. In addition, the absence of strong policy frameworks and coordinated implementation strategies limits scalability.

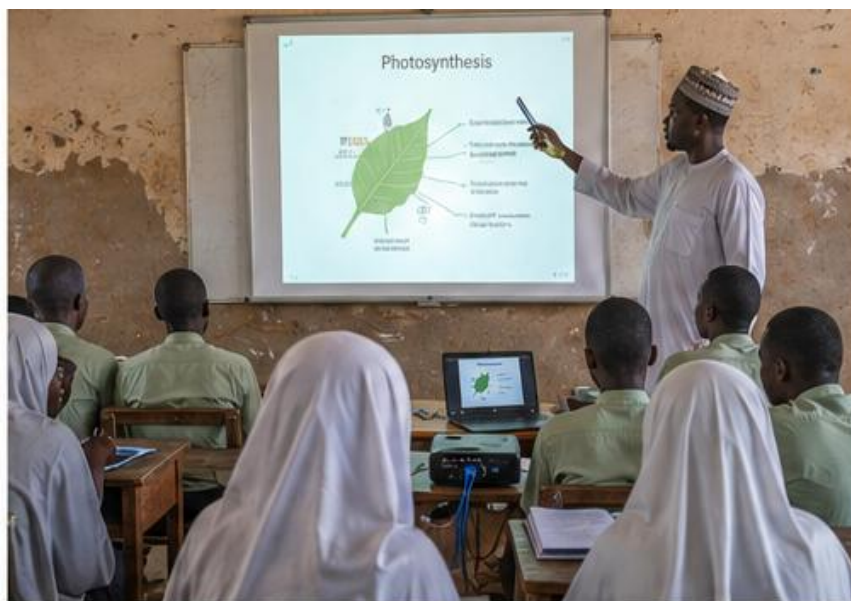


Figure 4. Teachers Integrating Digital Tools in Classroom Instruction in Adamawa State

Blended is best. The study further finds that blended learning approaches—combining digital tools with face-to-face instruction—yield the most effective outcomes. Purely digital or purely traditional methods alone are less impactful than integrated approaches that leverage the strengths of both. This hybrid model allows flexibility while maintaining human interaction, which is essential for learner support in fragile contexts.

In conclusion, the key findings indicate that digital learning is a powerful tool for overcoming educational barriers in fragile contexts in Northeast Nigeria, but its success depends on



Figure 5. Students Learning Through Offline Digital Content in Yobe State

multiple enabling factors. These include infrastructure development, teacher training, affordability, contextual relevance, and institutional support. When these elements are effectively addressed, digital learning can significantly improve access, engagement, and learning outcomes, contributing to a more resilient and inclusive education system.

Key Recommendations

1. **Strengthen digital infrastructure:** Government and partners should invest in reliable electricity (e.g., solar solutions), internet connectivity, and provision of affordable devices to ensure consistent access to digital learning, especially in remote and IDP communities.
2. **Enhance teacher capacity:** Continuous professional development programs should be implemented to equip teachers with practical digital skills, pedagogical strategies for technology integration, and ongoing technical support.
3. **Promote inclusive and low-cost solutions:** Expand the use of radio, offline digital content, and shared community learning hubs to reach learners who lack personal devices or internet access.
4. **Develop localized digital content:** Educational materials should be aligned with the national curriculum and adapted to local languages and cultural contexts to improve relevance, engagement, and comprehension.
5. **Strengthen policy and partnerships:** Establish clear policy frameworks and foster collaboration among government, NGOs, and communities to ensure coordinated, scalable, and sustainable digital learning interventions.

Acknowledgements

The researchers express sincere gratitude to all those who contributed to the successful completion of this study. Special appreciation goes to the teachers, students, and school administrators in the Northeast Nigeria who participated and provided valuable insights. Appreciation is also extended to academic supervisors and colleagues for their guidance and constructive feedback. The support of family and friends is deeply acknowledged for their encouragement throughout the research process. Finally, gratitude is given to CODE for funding this research and all organizations and stakeholders whose contributions made this study possible. The views expressed in this work are those of the creators and do not necessarily represent those of CODE, Global Affairs Canada (GAC) or the Government of Canada. This work was carried out with the aid of a grant from Global Affairs Canada.

Download the full research report at: <https://code.ngo/tlfcresearch/>.

© 2026 Paul Shehu Yaduma.

This report was produced under the Teaching and Learning in Fragile Contexts project and published by CODE with permission from the grantee. This report is licensed under the Creative Commons Attribution-Noncommercial 4.0 International Licence (CC BY-NC 4.0). Users may share and adapt the report for non-commercial purposes, provided appropriate credit is given to the author(s), and CODE.

References

Alabi, O. (2019). *Survey on quality of school sites and locations of Lagos State public schools*. Interdisciplinary Journal of Education, 2(2), 160–174.

Federal Ministry of Education (FME). (2019). *National policy on information and communication technology (ICT) in education*. Abuja, Nigeria: FME.

Trucano, M. (2016). *ICT in education in fragile and conflict-affected states*. World Bank.