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EdTech in Nigeria: A Rapid Scan

An overview of EdTech policies and interventions in Nigeria with a focus on northern Nigeria

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Reviewers	Nafisa Waziri, Laila Friese, and Jessica Lowden

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Abbreviations and acronyms

DPL	Digital personalised learning
DOTS	Digital Repository, Out of School Children, Teachers, and Skills
ECCDE	Early Childhood Care Development and Education
EMIS	Education Management and Information System
FME	Federal Ministry of Education
GDP	Gross Domestic Product
GPE	Global Partnership for Education
ICT	Information and communication technology
IDP	Internally Displaced Person
LGEA	Local Government Education Authorities
MICS	Multiple Indicator Cluster Surveys
MOEST	Ministry of Education, Science, and Technology
NITDA	National Information Technology Development Agency
PLANE	Partnership for Learning for All in Nigeria
SMoE	State Ministries of Education
SRAP	Strategic Roadmap and Action Plan
SSO	School Support Officer
SUBEB	State Universal Basic Education Boards
UBEC	Universal Basic Education Commission

About this scan

Commissioned as a Helpdesk request from the FCDO-funded Partnership for Learning for All in Nigeria (PLANE) project, this EdTech Hub rapid scan provides an overview of the EdTech landscape in Nigeria. Given the PLANE programme's focus on northern Nigeria, this rapid scan also assesses state-level policies and infrastructural challenges in three northern Nigerian states—Jigawa, Kaduna, and Kano. Furthermore, this rapid scan builds on the evidence presented in the previous EdTech Hub rapid scan from 2020 (⇧Dele-Ajayi & Taddese, 2020), which focused on all states and the situation before the Covid-19 pandemic.

The rapid scan relies on the following sources of information:

- Data gathered from the Federal Ministry of Education (FME) education websites

- Data gathered from Nigerian state websites

- Programme documents from institutions such as the World Bank, UNICEF, and UNESCO

- Previous EdTech scans conducted by EdTech Hub and other EdTech initiatives.

In addition to the desk research, a country expert provided quality assurance. While this rapid scan can serve as a useful starting point for understanding the current EdTech landscape of Nigeria, it is by no means exhaustive.

1. Country overview

This section provides an overview of Nigeria's education context, with a specific focus on northern Nigeria. It includes a brief overview of the education system and existing national education sector plans and strategies. It also examines how the Covid-19 pandemic impacted the use of EdTech.

1.1 Country background

Nigeria is a multi-ethnic and culturally diverse federation of 36 autonomous states and the Federal Capital Territory. It is bordered to the north by the Niger Republic, to the east by Chad and Cameroon, to the south by the Gulf of Guinea of the Atlantic Ocean, and to the west by the Republic of Benin (↑Alimigbe & Avoseh, 2022). It is the largest country in Africa, with a population of over 200 million people and over 300 ethnic groups and three dominant ones: the Igbo in the southeast, the Yoruba in the southwest, and the Hausa in the north (↑Green, 2023). The Hausa account for nearly 30% of the population. Yoruba and Igbo make up around 15% each, and Fulani account for about 6% of the population (↑Statistica, 2018). The rest of Nigeria's population is spread across ethnic groups that include the Annang, the Edo, the Efik, the Ibibio, the Itsekiri, and the Urhobo-Isoko (↑Dele-Ajayi & Taddese, 2020). Nigeria is also one of the most linguistically diverse countries in the world, with over 500 languages spoken (↑Translators without borders, 2024). While the official language is English, other major languages include Hausa, Igbo, and Yoruba (↑Translators without borders, 2024). The 2022 *National Language Policy* stipulates that the mother tongue or language of the immediate community shall be used as the medium of instruction in pre-primary and primary schools.

After several years of rapid growth from 2001 to 2014, economic development has stalled in Nigeria. Reasons for this include many factors, such as declining oil prices and the adverse effects of multiple shocks, including the Covid-19 pandemic. Nigerians are now experiencing one of the country's worst economic crises in years as a result of surging inflation caused by monetary policies that have devalued the currency to an all-time low against the dollar (↑Asadu, 2024). In addition, a rapid population growth of around 2.6% per year has widened the GDP per capita gap between Nigeria and its neighbouring countries in real terms (↑World Bank, 2023b).

1.2 Education system overview

The provision of basic education for all Nigerian learners has been a well-established objective of the Federal Ministry of Education (FME) since the country gained independence in 1960. This is evidenced by the numerous education development policies, implementation plans, and programmes at both federal and state levels. However, significant hurdles have impacted the implementation of various policies. Challenges include inadequate domestic financing, gaps in alignment between policies at different levels of government, and lack of continuity in policy implementation (↑DAI et al., 2021). Records show that annual budgetary allocations to education at the state level have been significantly low, failing to meet the UNESCO-recommended threshold of 15% to 20% of the budget (↑Agbai et al., 2021). This shortfall can primarily be attributed to acute revenue shortages and the nation's economic challenges (↑Agbai et al., 2021). Furthermore, when a new administration comes into power, they often attempt to introduce their own flagship programmes with little to no commitment to continuing initiatives of the previous administration (↑DAI et al., 2021). Ultimately, these challenges have resulted in low and varied enrolment rates across states, poor school infrastructure, shortages of trained and qualified teaching staff and gender disparities (↑DAI et al., 2021).

As highlighted in ↑Dele-Ajayi & Taddese's (2020) rapid scan, the FME and State Ministries of Education (SMoE) share responsibilities for implementing education policy in Nigeria with concurrent education authorities at both state and federal levels. Box 1 below describes the breakdown of responsibilities between the federal, state, and local governments in Nigeria. Basic education is funded through concurrent financing from the three tiers of government—the federal government provides 50%, the state 30%, and the local government provides 20% of the funding (↑Okwuosa et al., 2021). State investment in education is, therefore, heavily reliant on allocations from the federal government (↑Okwuosa et al., 2021). To support the successful implementation of the Universal Basic Education Act by states and local governments, the federal government also provides matching grants through a fund known as the Universal Basic Education Intervention Fund. However, for states to secure the matching grant, they must contribute no less than 50% of the total project costs (↑Zakariyau, 2023). In 2023, state governors called for a reduction in this matching requirement due to financial constraints and the fact that some states have access to more financial resources than others (↑Zakariyau, 2023).

Box 1. *Structure of the Nigerian government system and responsibilities for education*

- **The federal government** is responsible for policymaking, as well as setting and maintaining national education standards through the Federal Ministry of Education. The 2004 Universal Basic Education Act created the Universal Basic Education Commission (UBEC) as a federal agency with the primary responsibility of policy formulation, disbursement of Universal Basic Education Intervention Funds, stakeholder coordination and prescription of minimum standards.

- **State governments** are responsible for developing the basic education policies and strategies for the states via their ministries of education and State Universal Basic Education Boards (SUBEBs).

- **Local governments** are responsible for managing and delivering basic education services via the Local Government Education Authorities (LGEA).

Significant milestones have been achieved within the education sector in Nigeria. Progress has been made towards increasing access to basic education, with enrolment increasing from 34.7 million in 2018 to 39.8 million in 2022 (↑World Bank, 2023a). In addition, as of 2022, 7.2% of Nigeria's budget is allocated to education, an increase from the 5.7% allocated in 2021 (↑UNICEF, 2022a).

However, despite this progress, certain disparities across gender, state, and income levels remain. Nigeria has 14.6 million out-of-school children who are of basic education[1] age, which is more than any other country in the world (↑World Bank, 2023a). The 2021 Multiple Indicators Cluster Survey (MICS) highlighted that 29% of children aged 12–17 were out of school, with significant regional variation (↑National Bureau of Statistics & UNICEF, 2022). In the northwest and northeast regions combined, 46% of children aged 12–17 are out of school (↑National Bureau of Statistics & UNICEF, 2022). Table 1 below highlights key education indicators in Nigeria. A significant proportion of these children (an estimated 80% according to ↑Njoku (2020) are part of the Almajiri schooling system, which is the predominant form of education in northern Nigeria.[2]

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[1] Basic education in Nigeria includes primary and lower secondary grades and covers learners between 3–14 years.

[2] Almajiri refers to the Islamic education system, where children frequently travel to different locations to learn the teachings of the Quran and Hadith. Lessons are provided through schools known as 'Tsangayas'.

In response, the Nigerian government established the National Commission for Almajiri Education and Out-of-School Children in 2023 (⬆NCAOOSCE, 2024). The FME aims to integrate the over 10 million Almajiri and out-of-school children with the established National Commission for Almajiri Education and Out-of-School Children in order to ensure they learn skills that will make them self-reliant (⬆Olugbemi, 2023).

Girls' primary attendance rates are low throughout the northern regions of Nigeria. States in the northeast and northwest have girls' primary net attendance rates of 47.7% and 47.3%, respectively, meaning that more than half of girl learners are not in school (⬆UNICEF, 2021a). School attendance, especially for girls in northern Nigeria, is driven by various factors, including economic and sociocultural barriers. In some communities, norms and traditional practices also discourage formal education attendance, especially for girls (⬆UNICEF, 2021a).

Safety is a major concern that hinders both access and quality of education in Nigeria, specifically in the north. In 2021, there were 25 attacks on schools. 1,440 children were abducted, and 16 children killed. Also in 2021, around 618 schools were closed in six northern states (Kano, Katsina, Niger, Sokoto, Yobe, and Zamfara) over fears of attacks and abductions of pupils and members of staff. The closure of schools in these states significantly contributed to learning losses for over two months (⬆UNICEF, 2022a).

In addition to access and safety concerns, learning quality is also low in certain regions of Nigeria. Data from UNICEF highlights that 73% of children aged 7–14 do not demonstrate foundational reading skills and 75% are not equipped with foundational numeracy skills. These rates drop when considering learners in the northwest, where literacy and numeracy rates are at 10% and 9% respectively (⬆UNICEF, 2023). In addition, retention and transition rates remain low. The same report from UNICEF highlights that 5.9 million children enter primary school each year, but only 2.4 million remain in school by the end of junior secondary school (⬆UNICEF, 2023).

Table 1. *Education indicators in Nigeria*

Education indicator	Data
Total Number of learners	102 million children below the age of 18 live in Nigeria (↑UNICEF, 2023)
Total enrolment — primary education	31,771,916 pupils enrolled in primary school (↑UBEC, 2022)
Total enrolment — junior secondary education	8,003,397 pupils enrolled in junior secondary school (↑UBEC, 2022)
National net attendance rate — primary	68.4% of children within the intended age range for primary education are attending primary school or higher (↑National Bureau of Statistics & UNICEF, 2022)
National net attendance rate — junior Secondary	47.6% of children within the intended age range for junior secondary education are attending junior secondary or higher (↑National Bureau of Statistics & UNICEF, 2022)
National completion rate — primary and junior secondary	73% and 68%, respectively (National Bureau of Statistics & UNICEF, 2022)
Total number of basic education schools (constituting 6 years of primary school and 3 years of junior secondary schools)	171,027 basic education schools (↑UBEC, 2022)
Total number of teachers — primary	662,260 teachers in primary schools (↑UBEC, 2022)
Total number of teachers — junior secondary	309,747 teachers in junior secondary schools (↑UBEC, 2022)
Out-of-school children — primary	10.2 million children of primary age are out of school (↑UNICEF, 2023)
Out-of-school children — junior and senior secondary	8.1 million children of secondary age are out of school (↑UNICEF, 2023)
Out-of-school children — Almajiri	2.1 million children are Almajiri children (↑UNICEF, 2023)
Out-of-school girls — primary	3.9 million girls at the primary level are out of school (↑UNICEF, 2022b)
Out-of-school girls — junior secondary	3.7 million girls at the secondary level are out of school (↑UNICEF, 2022b)

1.3 Overview of EdTech in Nigeria

Nigeria introduced the *National ICT Policy* in 2010, followed by the *National Policy on ICT* in Education in 2019. This policy, prompted by an increase in the uptake of EdTech to improve learning outcomes, aimed to improve infrastructure, digital awareness, and financing. However, a key takeaway from analysing these policy documents is that while the policies are a positive commitment by the FME, data on implementation and results is scarce (↑Adediran et al., 2023). More details on the EdTech policy landscape along with details on the EdTech infrastructure in Nigeria are provided in Section 2 of this report.

Building teacher digital skills, an integral part of building an EdTech landscape, is outlined as a key challenge in Nigeria. An EdTech landscape assessment[3] funded by the Global Partnership for Education (GPE) highlighted that while some participants of the study were familiar with the digital ecosystem in Nigeria, 71.66% of the 500 teachers surveyed, had not used it for teaching and learning purposes (↑Alimigbe & Avoseh, 2022). Respondents' schools had insufficient digital infrastructure and most respondents had not attended training in the last five years, and the few who had, had attended face-to-face sessions. Most respondents could not say whether an insufficient number of internet-connected computers affects the use of ICT in teaching because they did not use ICT in teaching. Finally, most respondents did not have internet access in their schools and had limited access to smartphones[4] (↑Alimigbe & Avoseh, 2022). Another study that examined the digital skills of university teachers in southern Nigeria showed that while the university teachers who participated in the

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[3] The landscape assessment included the following: A teacher needs assessment in five basic education institutions within two area councils of the Federal Capital Territory: Abuja Municipal Area Council and Bwari Area Council of the Federal Capital Territory, with a total of 501 respondents (teachers). A checklist/instrument titled 'GPE COVID-19 response: Continuing Learning through alternative home-based platform—Teacher Needs Assessment' was developed and administered to teachers. The instrument had a bio-data section and nine other sections:

1. General awareness of the digital ecosystem
2. Presentation for in-person and remote learning
3. Use of MS office, Google Apps and IT support for teaching and learning
4. Use of technology for CPD
5. Use of internet for educational/instructional research and content creation
6. Integration of ICT for teaching and learning
7. Use of multimedia for teaching and learning
8. Challenges to using ICT in teaching and learning
9. Access to digital infrastructure.

[4] The study did not highlight the exact percentage of respondents, but did highlight that this appears to be a challenge across Nigeria, especially in rural areas where poor remuneration for teachers impacts their access to smartphones and other technologies.

study had very high levels of fundamental digital competence and skills they nonetheless had difficulties acquiring digital skills due to a lack of ICT training opportunities, the high cost of ICT literacy training, inadequate ICT facilities, and a lack of institutional support (↑Ogunbodede et al., 2023).

The Covid-19 pandemic deeply impacted both access to and quality of education in Nigeria. The Nigeria Education Sector Covid-19 Response Strategy, developed by the FME aimed to provide a systematic approach to mitigate the effects of Covid-19 and coordinate education efforts (↑Federal Ministry of Education, 2020). There was a heavy reliance on EdTech services during the Covid-19-related school closures, which affected about 40 million learners, 91% of whom are in primary and secondary schools (↑UNESCO, 2023). Closures worsened existing challenges to basic education and learning, with an estimated 10.5 million of the country's children aged 5–14 years not in school (↑Isisi et al., 2020). The FME responded to this crisis and sought to mitigate the immediate impact of the pandemic by using online and offline platforms, television, radio, and take-home materials to promote learning continuity.

The FME also encouraged the use of various e-learning platforms and introduced an e-learning policy to guide various state educational institutions in their pursuit of providing distance learning services during the pandemic (↑UNESCO, 2023). Open educational resources that were aligned with the national curriculum were promoted through online platforms, some of which are outlined below (↑UNESCO, 2023). The National Open University of Nigeria played a significant part in providing educational resources and continuity during the pandemic. Its current infrastructure and expertise in distance learning were used to support other institutions to do the same (↑UNESCO, 2023).

2. EdTech policy and strategy overview

This section provides an overview of national and state policies that focus on EdTech and create an enabling environment to implement EdTech interventions. The current administration, which came into power in 2023, has introduced a set of new education policies under four key thematic areas, which collectively form the acronym DOTS:

1. Data repository

2. Out-of-school-children

3. Teachers

4. Skills.

This section also examines whether existing EdTech policies and strategies incorporate a DOTS component.

2.1 National EdTech policies

Education in Nigeria is a shared responsibility across the three tiers of government, each with its own specific roles and responsibilities, as highlighted in Box 1 above. In terms of policy formulation, the federal government, through the Federal Ministry of Education (FME) and its agencies, is responsible for policymaking and setting national education standards. Meanwhile, state governments are tasked with developing and implementing basic education policies and strategies for the successful implementation of the Universal Basic Education Programme in their respective states (⬆DAI et al., 2021) via their ministries of education and State Universal Basic Education Boards (SUBEBs). However, as previously discussed, several factors hinder the implementation of these policies and strategies in Nigeria. While factors such as misalignment between policies at the federal and state levels, lack of political continuity, and gaps in requisite expertise present significant challenges, one key obstacle is the lack of sufficient funding to implement these policies. More often than not, the government does not allocate adequate funds for the execution of the projects and plans outlined in policies, thereby significantly undermining effective implementation. Table 2 below provides an overview of national EdTech policies in Nigeria and indicates the DOTS policy component(s), if relevant.

Table 2. *National EdTech policies*

National policy/strategy	Ministry/agency involved	Description	DOTS policy component
National Information and Communication Technology (ICT) Policy	Federal Ministry of Communications, Innovation, and Digital Economy	The *National ICT Policy* aims to create an enabling environment for the expansion of affordable ICT networks and services and to fully integrate ICT into the socio-economic development of Nigeria (⇧Ministry of Communication Technology, 2012).	Skills development and acquisition for all levels
National Policy on Information and Communication Technologies (ICT) in Education	Federal Ministry of Education	The *National Policy on ICT in Education* guides implementing government agencies on leveraging technology to transform teaching, learning, research, and the administration of education (⇧Federal Ministry of Education, 2019). It also outlines various initiatives and strategies aimed at integrating ICT into education.	Skills development and acquisition for all levels Teacher training & development
National Policy on Education Management Information System (EMIS) and Implementation Guideline	Federal Ministry of Education	The *National Policy on EMIS* provides guidance for the management of education information at different levels of the education sector, outlining the specific roles and responsibilities of different education stakeholders, from the schools to the federal level. The goal is to streamline data management to support evidence-based decision-making and planning in the education sector (⇧Federal Ministry of Education, 2021).	Data repository that is reliable, authentic and coordinated

National policy/strategy	Ministry/agency involved	Description	DOTS policy component
National Teacher Education Policy	Federal Ministry of Education	The *National Teacher Education Policy* highlights objectives and strategies to improve the quality of teaching and education in Nigeria. It emphasises the importance of recruiting knowledgeable and effective teachers and retraining and upskilling them to teach to world-class standards (⬆Federal Ministry of Education, 2014). The policy document mentions the need to develop teachers' ICT application skills (⬆Federal Ministry of Education, 2014).	Teacher training & development
National Digital Economy Policy and Strategy (2020–2030)	Federal Ministry of Communications, Innovation, and Digital Economy	The *National Digital Economy Policy and Strategy* outlines plans to empower citizens with digital literacy skills, including the integration of digital literacy programmes into the national education curriculum at all levels, training, and capacity building among public sector employees on the use of digital tools. It also addresses lowering access barriers to digital tools for all citizens (⬆Federal Ministry of Communications and Digital Economy, 2019).	Skills development and acquisition for all levels

National policy/strategy	Ministry/agency involved	Description	DOTS policy component
National Information Technology Development Agency (NITDA) Strategic Roadmap and Action Plan 2024–2027 (SRAP 2.0)	NITDA	The *Strategic Roadmap and Action Plan* (SRAP) 2.0 outlines the government's commitment to leveraging digital technology and innovation for economic transformation and inclusive growth (↑NITDA, 2024). In education and learning, SRAP 2.0 identifies initiatives such as implementing the *National Digital Literacy Framework* and the '3 Million Tech Talents Training' initiative to expand access to digital education and bridge the international technology talent gap, respectively (↑NITDA, 2024). SRAP 2.0 builds on the success of SRAP 1.0, continuing the implementation of unfinished initiatives.	Skills development and acquisition for all levels
National Digital Literacy Framework	National Information Technology Development Agency	The *National Digital Literacy Framework* outlines Nigeria's national digital literacy and skills agenda and provides a proposed framework that offers guidance to relevant stakeholders on the specific competencies of digital literacy and skills required for a digital nation (↑NITDA, 2023).	Skills development and acquisition for all levels

2.2 State EdTech policies

States across Nigeria also have different ICT policies that are aimed at building EdTech infrastructure and increasing access. For example, in Adamawa state, the education sector plan highlights the provision of ICT equipment, internet services, and the recruitment of ICT teachers and education management and information system officers

as strategic responses to state educational challenges (↑Adamawa State Government, 2022). Similarly, the 2019–2029 Kaduna State ICT policy (highlighted below) supports the distribution of 5,000 ICT tablets in senior secondary schools (↑UNESCO, 2023). In northern Nigeria, state government policies towards EdTech primarily focus on building EdTech infrastructure and enhancing the capacity of education professionals to support future EdTech integration. In Jigawa, Kaduna, and Kano education sector plans emphasise the establishment of education management and information technology systems (EMIS), providing ICT infrastructure and equipment, and improving data management capabilities. Table 3 below provides an overview of state EdTech policies, again indicating DOTS policy component(s) as relevant.

Table 3. *State EdTech policies (continues on pages 19 and 20)*

State EdTech strategy	Ministries/agencies Involved	Description	DOTS Policy component
Jigawa State Education Sector Strategic Plan (SESP) 2013–2022	Ministry of Education, Science and Technology (MOEST), Jigawa SUBEB and LGEA	The *Education Sector Strategic Plan* outlined the education vision of Jigawa state, with policy goals of improving access, quality, and relevance of education at all levels, improving learning environments, and ensuring sustainable financing for education (↑Jigawa State Government, 2013). Key EdTech interventions described in the plan include establishing a functional EMIS, capacity building on education data management, and provision and maintenance of ICT tools and equipment (↑Jigawa State Government, 2013).	Data repository that is reliable, authentic, and coordinated

State EdTech strategy	Ministries/agencies Involved	Description	DOTS Policy component
Jigawa 2016 Comprehensive Development Framework (CDF-II)	Ministry of Education, Science, and Technology and SUBEB	The *2016 Comprehensive Development Framework* outlines the policy objectives and targets to be pursued by most sectors for socio-economic development and reform (⬆Jigawa State Directorate of Budget and Economic Planning, 2016). The key EdTech interventions highlighted in the framework are using ICT-based teaching and learning to increase student exposure to 21st-century learning strategies and greater coordination of the SUBEB and MOEST EMIS database (⬆Jigawa State Directorate of Budget and Economic Planning, 2016).	Data repository that is reliable, authentic, and coordinated Skills development and acquisition for all levels
Kaduna Education Sector Strategic Plan 2019–2029	Ministry of Education, Science and Technology and its affiliated institutions	The *Kaduna Education Sector Strategic Plan* outlines Kaduna's strategic priorities within the education system to improve learning outcomes by providing effective, efficient, relevant, and quality education services (⬆Kaduna State MOEST, 2019). The plan highlights EdTech focus areas, including providing support for ICT equipment, software, and expertise, capacity building for education sector professionals on using technology for data management and integrating technology in teaching and learning processes (⬆Kaduna State MOEST, 2019).	Data repository that is reliable, authentic and coordinated Teacher training & development

State EdTech strategy	Ministries/agencies Involved	Description	DOTS Policy component
Kano State Education Strategic Plan (2009–2018)	Kano State Ministry of Education, Science and Technical Schools Board, and Science Secondary Schools Management Board	The *Kano State Education Sector Strategic Plan* provides an overview of the education sector policies, objectives, and strategies for ensuring access to education for all state citizens (⬆Ministry of Education Kano State, 2008). The key EdTech strategies highlighted in the plan include: developing a state education policy on ICT, conducting a needs assessment and feasibility study to provide ICT infrastructure in schools, and developing a costed plan for the gradual expansion of ICT facilities in schools and tertiary institutions (⬆Ministry of Education Kano State, 2008).	n/a

Box 2. *Artificial intelligence in Nigeria*

The Federal Ministry of Communications, Innovation and Digital Economy (FMCIDE), led by Dr Bosun Tijani, has shown increasing interest in artificial intelligence (AI), as evidenced by plans and workshops aimed at developing a national artificial intelligence strategy. According to the ministry, the purpose of the strategy is to responsibly leverage the AI revolution to achieve national goals related to job creation, social inclusion, and sustainable development (⇡FMCIDE, 2023). In April 2024, FMCIDE hosted the workshop, bringing together 120 leading Nigerian AI researchers and practitioners, technology companies, civil societies, and other relevant stakeholders to co-create a comprehensive AI strategic plan (⇡FMCIDE, 2024).

While AI is still an emerging technology in Nigeria, there have been notable interventions leveraging it in northern Nigeria. One such initiative is the 'AI for Beginners Video Learning Series' by the Kaduna State Government, Google, and Data Science Nigeria. The series explains AI concepts in Hausa, making complex and technical information more accessible and culturally relevant for citizens (⇡Adejumoh, 2024). Another significant intervention is the new partnership between the International Rescue Committee (IRC) and OpenAI called apprendIA. This AI-driven educational chatbot delivers personalised education experiences that teachers and parents in crisis-affected communities in northeast Nigeria, Colombia, and Bangladesh can access via messaging platforms regularly used by clients (⇡IRC, 2024). By leveraging OpenAI's ChatGPT, the goal is to develop content rapidly, support overextended teachers, and improve learning outcomes through digital personalised learning experiences (⇡IRC, 2024).

3. ICT Infrastructure overview

This section provides an overview of ICT infrastructure access across Nigeria, with a specific focus on northern Nigeria.

3.1 ICT infrastructure in Nigeria

Access to key ICT infrastructure is often cited as a challenge for the development and implementation of EdTech interventions in Nigeria (⇡Dele-Ajayi & Taddese, 2020). MICS 2021 data, as seen in Table 4, highlights the low levels of internet connectivity at a national level, with only 34.6% of households having access to the internet. The number drops even further in the northern states of Jigawa and Kano, where only 28.3% of households and 28.7% of households, respectively, have access to the internet. Table 5 below details the sum of all active telephone subscribers and teledensity in Nigeria (2013–2023).

Table 4. *Percentage of households who own a radio, television, telephone, computer, and have access to the internet at home in northern Nigeria* (⇡National Bureau of Statistics & UNICEF, 2022)

States	Radio	Television	Mobile phone	Computer	Internet
National	47.8	43.2	87.6	9.4	34.6
North central					
Benue	37.9	24.3	79.2	3.9	18.4
Federal Capital Territory, Abuja	53.9	63.7	94.1	23.3	55.7

States	Radio	Television	Mobile phone	Computer	Internet
Kogi	43.6	40.0	91.2	7.1	34.2
Kwara	60.4	58.2	90.2	9.2	34.3
Nassarawa	38.7	30.3	88.9	4.8	19.7
Niger	43.6	37.9	92.0	5.5	26.3
Plateau	33.2	22.7	87.6	7.3	33.5
Northeast					
Adamawa	34.5	19.1	76.8	3.6	17.0
Bauchi	24.0	7.9	77.9	1.4	13.5
Borno	23.1	21.7	87.6	5.3	21.2
Gombe	41.7	18.3	81.2	6.0	31.9
Taraba	30.5	9.8	82.6	4.6	34.1
Yobe	29.5	9.4	73.9	2.8	15.5
Northwest					
Jigawa	23.5	4.4	73.8	2.5	28.3
Kaduna	47.8	49.6	92.2	10.4	44.5

States	Radio	Television	Mobile phone	Computer	Internet
Kano	45.6	29.0	86.3	5.6	28.7
Katsina	38.0	11.9	79.8	4.6	21.1
Kebbi	27.7	13.7	72.3	3.2	10.5
Sokoto	36.2	18.4	65.1	5.1	22.7
Zamfara	64.8	10.5	82.0	2.9	15.5

Table 5. *Total sum of all active telephone subscribers and teledensity in Nigeria (2013–2023)* (⇡National Communications Commission, 2024)

Year	Number of subscriptions	Teledensity (%)
2014	139,143,610	99.39%
2015	151,017,244	107.87%
2016	154,529,780	110.38%
2017	145,059,514	103.61%
2018	172,871,094	123.48%
2019	184,699,409	96.76%
2020	204,601,313	107.18%
2021	195,463,898	102.40%
2022	222,571,568	116.60%
2023	224,713, 710	103.66%

An estimated 44.4% of Nigerians have access to a smartphone, according to data from the Alliance of Affordable Internet (↑Premise, 2022). Table 6 below highlights the distribution of subscribers across different mobile phone generations in Nigeria from May 2023 to March 2024. Notably, the majority of mobile phone users rely on 2G devices, underscoring significant barriers to accessing advanced networks such as 4G or 5G networks. Despite increased deployment of 3G, 4G, and 5G coverage in Nigeria, mobile broadband penetration has not met expectations due to factors such as access to and affordability of smartphones, quality of service, internet speed, and limited access to service outside major urban areas (↑USAID, 2022).

Table 6. *Percentage of subscribers using telecommunications services per mobile phone generations in Nigeria (2023–2024)* (↑National Communications Commission, 2024)

Month	2G (%)	3G (%)	4G (%)	5G (%)
May 2023	58.36	16.46	25.06	0.12
July 2023	60.85	14.85	24.16	0.13
September 2023	60.08	10.57	28.47	0.88
November 2023	59.32	9.81	29.91	0.96
January 2024	57.78	9.36	31.75	1.11
March 2024	56.97	9.04	32.74	1.24

The MICS 2021 data also highlights the percentage of women and men who have a range of ICT skills. The survey defines ICT skills as the percentage of women and men aged 15–49 years who have carried out at least one specific computer-related activity[5] in the last three months. Only 5.8% of surveyed women and 11.4% of surveyed men in Nigeria meet that criteria, as seen in Table 7.

Table 7: *Percentage of women and men aged 15–49 with mobile phone ownership and usage, computer usage, internet usage, and ICT skills* (⇡National Bureau of Statistics & UNICEF, 2022)

Information and communication technology indicator	Percentage (women)	Percentage (men)
Use of computer	6.4	12.1
Ownership of mobile phone	58.2	73.4
Use of mobile phone	78.6	88.4
Use of internet at least once a week during the last three months	17.9	32.5
ICT skills	5.8	11.4

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[5] A person is considered to have ICT skills if they performed at least one of the nine computer-related activities, including copying or moving a file/folder; using copy and paste; sending an email with a file attachment; using a basic arithmetic formula in a spreadsheet; connecting or installing a new device, such as a modem, camera, or printer; finding, downloading, installing and configuring software; creating an electronic presentation with presentation software, including text, images, etc; transferring a file between a computer and other device, and writing a computer programme in any programming language (⇡UNICEF, 2021b).

3.2 The state of EdTech infrastructure in Nigerian public schools[6]

More recent data on the state of ICT infrastructure in Nigerian primary and junior secondary schools remains limited. For this section, we draw on data from the '2018 Indicator Profile for Basic Education Institutions in Nigeria', obtained from the Universal Basic Education Commission (UBEC) website and presented below in Table 8. However, while data was not available on newer initiatives, it is imperative to highlight that the Federal Ministry of Education (FME) has established several new initiatives aimed at increasing digitisation in basic education schools. These initiatives include the Smart Schools initiative and the Digital Resource Centre (established between March 2023 and 2024), both of which focus on providing teachers and students with opportunities to engage with technology-mediated teaching and learning (⬆UBEC, 2022).

Table 8. *Percentage of basic education schools with computer(s) and source of power in Nigeria by region (2018)* (⬆UBEC, 2019)

Region	Total number of primary schools (ECCDE[7] inclusive)	Total number of junior secondary schools	% of schools with computer(s)—primary	% of schools with computer(s)—junior secondary	% of schools with source of power—primary	% of schools with source of power—junior secondary
National	63,798	13,029	5.66	34.32	14.10	45.21
North central	13,253	2,595	3.56	28.44	7.00	38.38
Northeast	10,266	2,159	2.64	17.14	6.50	23.62
Northwest	20,274	3,064	4.18	33.21	14.29	45.45
Southeast	5,491	1,352	5.14	51.26	8.14	44.97
South-South	5,886	1,718	4.93	26.19	31.91	41.21
Southwest	8,628	2,140	16.76	56.17	25.23	78.27

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[6] In Nigeria, public schools are government-funded and government-run.
[7] Early childhood care development and education

With only 5.66% of primary schools having computer(s) and 14.10% having power sources, the majority of primary schools in Nigeria do not have access to necessary infrastructure to support EdTech integration. While junior secondary schools have greater access to computers and sources of power, a significant number of these schools still lack access to essential ICT infrastructure. In the ⇡Dele-Ajayi & Taddese's (2020) rapid scan, a key informant from the Ministry of Education explained that the

> "[...] *majority of the primary schools do not have electricity, internet access or computers/tablets or any devices for teaching and learning. Most of the secondary schools have electricity via connection to the national power grid or via generators. However, the electricity situation is generally bad — there are several weeks of blackout, and even when the electricity is available, the current is too low to power anything.*" (⇡Nigeria: Dele-Ajayi & Taddese, 2020, p. 12)

There is also significant regional disparity in the availability of power and computers, with southern regions having better access to ICT infrastructure as compared to schools in the northern regions of Nigeria.

Table 9. *Percentage of basic education schools in northern Nigeria with computer(s) and source of power by state (2018)* (↑Universal Basic Education Commission, 2019)

State	Total number of primary schools (ECCDE inclusive)	Total number of junior secondary schools	% of schools with computer(s) —primary	% of schools with computer(s) —junior secondary	% of schools with source of power—primary	% of schools with source of power—junior secondary
North central	13,253	2,595	3.56	28.44	7.00	38.38
Benue	2,336	536	1.80	26.12	3.17	28.92
Federal Capital Territory, Abuja	597	164	17.42	36.59	26.97	65.85
Kogi	2,054	460	2.73	14.36	5.50	17.83
Kwara	1,556	458	9.32	39.74	16.84	60.04
Nassarawa	1,168	262	1.37	14.12	3.94	33.24
Niger	3,195	440	1.69	19.09	5.73	35.00
Plateau	2,347	275	2.34	61.45	3.79	59.64
Northeast	10,266	2,159	2.64	17.14	6.50	23.62
Adamawa	1,910	499	3.87	13.23	10.58	24.05
Bauchi	2,879	685	2.12	15.77	4.34	19.85
Borno	950	229	3.26	14.85	11.26	29.26

State	Total number of primary schools (ECCDE inclusive)	Total number of junior secondary schools	% of schools with computer(s) —primary	% of schools with computer(s) —junior secondary	% of schools with source of power—primary	% of schools with source of power—junior secondary
Gombe	1,465	357	4.51	17.93	7.44	22.69
Taraba	2,024	250	1.38	23.60	3.06	25.60
Yobe	1,038	139	1.06	28.06	5.97	30.22
Northwest	20,274	3,065	4.18	33.21	14.29	45.45
Jigawa	2,350	543	1.96	16.39	6.94	14.73
Kaduna	3,727	366	3.11	28.14	6.90	46.72
Kano	5,885	1,161	5.47	38.93	33.03	59.43
Katsina	2,744	262	5.03	33.59	6.27	54.96
Kebbi	1,876	280	5.49	40.36	7.62	50.71
Sokoto	2,050	262	2.83	47.41	6.05	39.69
Zamfara	1,642	191	3.96	25.13	5.72	32.46

4. Key EdTech actors and interventions

This section highlights key actors within the EdTech space in Nigeria, with a specific focus on northern Nigeria. This list is not exhaustive and is based on an initial desk review. It focuses on both state and non-state actors within the EdTech space in Nigeria.

4.1 Government actors

Table 10. *Key government partners in EdTech*

Government ministry/agency	Roles and responsibilities in EdTech
Federal Ministry of Education (FME)	The FME is responsible for setting a vision and agenda for the use of EdTech in Nigeria. The FME collaborates with various federal government agencies, State Ministries of Education (SMoEs), State Universal Basic Education Boards (SUBEBs), non-governmental organisations, and school administrators to fulfil their responsibilities as outlined in the National Policy on ICT (⤒ Dele-Ajayi & Taddese, 2020).
Federal Ministry of Innovation, Communications and Digital Economy (FMCIDE)	FMCIDE is responsible for developing digital education programmes (⤒FMCIDE, 2023). FMCIDE also supports the integration of digital literacy and skills into the national education curriculum at all levels (⤒Dele-Ajayi & Taddese, 2020).
National Information Technology Development Agency (NITDA)	NITDA is a federal agency responsible for implementing the National ICT policy. One of their main responsibilities is to develop e-learning systems, with the goal of expanding access to learning opportunities for Nigerians. Additionally, they also contribute to the development of digital skills and competencies of all learners, thus bridging the technical gap and preparing them for work in an increasingly digital world (⤒Dele-Ajayi & Taddese, 2020).

4.2 Non-government actors

Development partners, including organisations such as UNICEF, USAID, GPE, and KfW, as well as private organisations like Microsoft, MasterCard Foundation, and Co-Creation Hub have been key partners supporting the integration of education technology in northern Nigeria and the nation as a whole.

In Nigeria, government financing has been insufficient to cover the integration of ICT in education due to factors such as the federal government not having a specific provision for ICT in the national budget or budget allocations to state governments. Moreover, a significant portion of the education budget is dedicated to personnel costs, leaving little room for other expenses (⬆Dele-Ajayi & Taddese, 2020). Consequently, both federal and state governments rely heavily on donors and non-governmental organisations to bridge the funding gap, particularly for non-salary expenditures (⬆Dele-Ajayi & Taddese, 2020). These partners also play key roles in implementing EdTech interventions and providing capacity building for teachers and education professionals. The following section outlines a list of EdTech interventions supported by government and non-government actors in Nigeria.

4.3 EdTech interventions in Nigeria

This section highlights key EdTech interventions in Nigeria, with a specific focus on initiatives that work in northern Nigerian states. This list includes those being implemented by both the FME and state governments, along with non-government actors. As in previous tables, if an intervention includes a DOTS component, this is indicated.[8]

Table 11. *Ongoing EdTech initiatives in northern Nigeria*

EdTech Initiative	Description	DOTS policy component
Smart Schools Programme	**Overview**: The Smart Schools Programme was launched by the FME to improve the capacity of teachers in developing and using ICT resources, increase access to high-quality teaching and learning materials for both teachers and students, and improve learning outcomes. The programme seeks to provide teachers and students with the opportunity to experience technology-aided teaching and learning (⬆UBEC, 2022). **Target group**: Schools, teachers, and learners in all states in Nigeria. **Technology**: ICT infrastructure. **Reach/scale**: Currently, the federal government has established 37 smart schools across Nigeria, including in Bauchi,	Skills development and acquisition for all levels Teacher training & development

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[8] Early on in the review, the authors learnt of an E-learning platform hosted on the Kaduna Ministry of Education's website and an initiative to capture Local Government Education Authority (LGEA) staff data online in Jigawa State. However, at this stage in the review, the webpages of these initiatives are no longer accessible or active.

EdTech Initiative	Description	DOTS policy component
	Kaduna, Kano, Katsina, Kwara, and Niger. **Implementing ministries/agencies**: FME, UBEC, National Educational Research and Development Council, National Teachers Institute, and Korea International Cooperation Agency. **Status of intervention:** Ongoing (2019 to present).	
Digital Resource Centre	**Overview**: The Digital Resource Centre is focused on providing digital academic content and resources for UBEC Smart Schools and e-learning centres in Nigeria (↑UBEC, 2022). It functions as the headquarters for the Smart Schools initiative, and the centre is also responsible for training teachers and principals on blended and digital literacy (↑Federal Ministry of Education, 2024); ↑UBEC, 2022). **Target group**: UBEC Smart schools and e-learning centres across Nigeria. **Technology**: An electronic database of educational resources. **Reach/scale**: 37 Smart schools in Nigeria. **Implementing ministries/agencies**: UBEC. **Status of intervention:** Ongoing.	Teacher training & development

EdTech Initiative	Description	DOTS policy component
Nigeria Learning Passport[9]	**Overview**: The Nigerian Learning Passport is an e-learning initiative that provides children with continuous access to quality education. The platform contains over 15,000 learning resources aligned with the national curriculum available in English, Igbo, Hausa, and Yoruba. Teachers can also access professional development resources on the platform (↑UNICEF, 2024). **Target group**: Early childhood education, primary and secondary education, adolescent skills, technical and vocational education, teachers, and parents in 18 states, including Bauchi, Jigawa, Kaduna, Katsina, Kebbi, Nassarawa, and Niger. **Technology**: A digital e-learning platform with online, mobile, and offline capabilities that allows teachers and learners in low-connectivity areas to also access content. **Reach/scale**: 1,000,000+ subscribers across Nigeria (↑UNICEF, 2024). **Implementing ministries/organisations**: FME, SMOEs, and UNICEF. **Status of intervention:** Ongoing (2022 to present).	Skills development and acquisition for all levels Teacher training & development

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[9] See https://nlp.education.gov.ng. Retrieved 13 September 2024.

EdTech Initiative	Description	DOTS policy component
eLearn[10]	**Overview:** eLearn is a centralised e-learning platform that stores and provides access to high-quality educational resources for learners and teachers, including lesson plans, audio lessons, video lessons, practice questions, quizzes, and assignments. The platform pulls digital content from the Federal Ministry of Education (FME), states, and development partners and ensures that its e-learning content is accessible to all learners.	
	Target group: Students and teachers in primary, secondary, and tertiary institutions.	
	Technology: eLearn is an online repository that provides access to curriculum-aligned educational resources for teachers and learners in Nigeria. It uses a 'search and discover' model, which connects teachers and students to a variety of learning resources, including those from other FME platforms such as Ignite and Inspire. The platform has various accessibility features that caters to learners with special educational needs and disabilities.	
	Reach/scale: 30,000 registered teachers and 1,500,000 registered learners (⬆Federal	

[10] See https://elearn.education.gov.ng/. Retrieved 18 September 2024.

EdTech Initiative	Description	DOTS policy component
	[Ministry of Education, 2024]). **Implementing organisations:** FME and FCDO Partnership for Learning for All in Nigeria. **Status of intervention:** Ongoing (2024 to present)(↑[Federal Ministry of Education, 2024]).	
Co-Creation Hub/Re-learn[11]	**Overview**: Re-learn aims to use evidenced-based teaching methods and digital tools to improve learning outcomes in Nigeria. Re-learn has the Schools EdTech Clinic, which aims to increase the use of EdTech solutions within schools by evaluating their needs, finding gaps, and facilitating referrals to EdTech solution providers. **Target group**: Students, teachers, and school owners/administrators, and government education stakeholders. **Technology**: n/a **Reach/scale**: Across the numerous interventions that the Co-Creation Hub and Re-learn have launched, the project has trained over 6,698 teachers, worked with over 100,285 students, and collaborated with over	Skills development and acquisition for all levels Teacher training & development

[11] See https://relearn.ng/. Retrieved 13 September 2024.

EdTech Initiative	Description	DOTS policy component
	95 schools nationwide (↑Re-learn, 2024). **Implementing organisations**: Co-Creation Hub. **Status of intervention:** Ongoing (2020 to present).	
Inspire[12]	**Overview**: Developed as a response to the disruption of learning caused by the Covid-19 pandemic, the FME launched Inspire to provide access to high-quality educational content at all levels of education. **Target group**: Primary, secondary, and tertiary education students. **Technology**: Inspire is a web-based e-learning platform for students at all levels of education to access a range of learning resources in different formats (videos, audio lessons, and e-books). **Reach/scale**: As a federal government initiative, Inspire has the potential to reach all learners in Nigeria. **Implementing ministries**: FME. **Status of intervention:** Ongoing (2021 to present) (↑Federal Ministry of Education, 2021).	Skills development and acquisition for all levels

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[12] See https://inspire.education.gov.ng/register. Retrieved 13 September 2024.

EdTech Initiative	Description	DOTS policy component
Ignite[13]	**Overview**: The FME launched Ignite in 2021 to assist teachers with developing lesson plans, sharing resources, and collaborating. **Target group**: Teachers across different levels of education. **Technology**: Ignite is a web-based digital platform to facilitate lesson planning and resource sharing. **Reach/scale**: As a federal government initiative, Ignite has the potential to reach all teachers in Nigeria. **Implementing ministries**: FME. **Status of intervention:** Ongoing (2021 to present).	Teacher training & development
Radio Learning Classes	**Overview**: The radio learning classes aim to provide out-of-school children in Internally Displaced Person (IDP) camps in Borno State with access to education. The goal is to transition students into formal education after a nine-month period. Through the radio learning clubs, students can discuss learnt material, make new friends, and also have an avenue to cope with trauma (↑Adebayo, 2023).	Skills Development and Acquisition for all levels

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[13] See https://ignite.education.gov.ng/. Retrieved 13 September 2024.

EdTech Initiative	Description	DOTS policy component
	Target group: Out-of-school children in camps for IDP camps in Borno State. **Technology**: Radio technology. **Reach/scale**: As a Borno State SUBEB-recommended initiative, these radio learning classes have the potential to reach all out-of-school learners in the IDP camps. **Implementing ministries/organisations**: UNICEF, Borno SUBEB, and Restoration of Hope Initiative. **Status of intervention:** Ongoing.	
Northern Education Initiative Plus (NEI Plus)	**Overview**: During the Covid-19 pandemic, the NEI Plus programme produced and broadcast 670 lessons in Hausa and English over radio and television to improve children's reading skills in Bauchi and Sokoto states (⬆Fugate, 2020). The NEI Plus team has also produced instructional videos for teachers and school support officers (SSOs) to help pedagogical instruction in schools (⬆Fugate, 2020). Within this project, ICT-backed coaching and monitoring tools have also been implemented to improve the quality of instructional support available to teachers (⬆USAID Nigeria, 2018). **Target group**: Learners in Grades 1–3 in Sokoto and Bauchi state, teachers, SSOs, and	Skills development and acquisition for all levels Teacher training & development

EdTech Initiative	Description	DOTS policy component
	other key stakeholders concerned with improving reading outcomes in Northern Nigeria. **Technology**: Radio, television broadcasts, and ICT-backed coaching and monitoring tools. **Reach/scale**: In 2020, 600,000 students in Sokoto and Bauchi, teachers and SSOs in Sokoto and Bauchi. **Implementing ministries/organisations**: FME, SMoEs (in Bauchi and Sokoto), USAID, UNICEF, Creative Associates International, and some other US-based international, and four local organisations. **Status of intervention:** 2015–2020.	
Learn at Home (⬏Mastercard Foundation, 2020)	**Overview**: Learn at Home is an EdTech initiative dedicated to providing quality remedial lessons and learning support to Nigerian students, particularly those who could not attend classes during the Covid-19 lockdown because they had no internet access. **Target group**: Primary, junior secondary, and senior secondary school students across nine states, including Borno, Kaduna, Kano, Plateau, and Sokoto, and the Federal Capital Territory.	

EdTech Initiative	Description	DOTS policy component
	Technology: Delivering audio content through dedicated radio stations after regular school hours; delivering audio content via mobile channels using Unstructured Supplementary Service Data (USSD) codes on non-internet phones; free interactive SMS quizzes, and interactive-voice-response-based personalised learning where students can learn without access to the internet. Learn at Home also has a call centre which offers real-time academic and emotional support and assistance. **Reach/scale**: The goal is to reach millions of students through varied offline telecommunication channels. **Implementing ministries/organisations**: Data Science Nigeria (DSN), MasterCard Foundation, and Malezi. **Status of intervention:** Ongoing (2021 to Present)(↑Mastercard Foundation, 2020)	
HITCH[14]	**Overview**: HITCH is a digital e-learning platform that offers a large library of educational videos tailored to the Nigeria curriculum to improve learning experiences	Skills development and acquisition for all levels

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[14] See https://hitch.video/. Retrieved 13 September 2024.

EdTech Initiative	Description	DOTS policy component
	and ensure continuity of schooling for all students. **Target group**: Basic education students, senior secondary school students, and teachers across Nigeria. **Technology**: An e-learning tool that has both online and offline features and offers academic and vocational video resources. **Reach/scale**: As a federal-government-supported resource, HITCH has the potential to reach all basic and secondary school students in Nigeria who have access to the necessary technology. **Implementing organisations**: UNICEF, HITCH, Mastercard Foundation, and Teach for Nigeria. **Status of intervention:** Ongoing (↑HITCH, 2024).	
Digital Bridge Initiative[15]	**Overview**: The Digital Bridge Initiative was established to bridge the digital divide in Nigeria by providing access to ICT tools and resources in schools and other educational institutions (↑UNESCO, 2023). Currently, the initiative offers courses such as e-learning	Teacher training & development

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[15]See https://dbi.edu.ng/. Retrieved on 13 September 2024.

EdTech Initiative	Description	DOTS policy component
	instruction design and e-learning course development and facilitation.	
	Target group: Teachers, lecturers, academic planning officers, and heads of school.	
	Technology: n/a	
	Reach/scale: 250,000 students trained, although this number includes non-education related courses.	
	Implementing organisations: Nigerian Communications Commission.	
	Status of intervention: Ongoing (From 2004 and ongoing).	

5. Key challenges and opportunities

This section highlights key challenges and opportunities that exist within the EdTech landscape in Nigeria.

5.1 Challenges

Lack of valid and reliable EdTech data

Availability of reliable and timely EdTech data remains a significant challenge in Nigeria, with limited data available across all levels of education—from schools to the state level. Although some data on EdTech access across Nigeria exists, it is still insufficient to paint a comprehensive and accurate picture of the EdTech landscape in the country. Updated data around power and internet access, low- and high-tech initiatives at the state level, and distinct data around teacher digital skills are lacking. Additionally, while some data is available at the federal level, state-level data on both access and usage is extremely limited.

In Nigeria, there are several EMIS managed by three different tiers of government: the National Education Management Information System or NEMIS (managed at a federal level), the State Education Management Information System or SEMIS (managed at a state level) and the Local Government Education Management Information System or LEMIS (managed at local government level). Data is collected at the school level, after which it is transferred to the LEMIS and then the SEMIS/NEMIS. Given that schools are the primary source of data, it is imperative that school leaders and staff are trained in effective data collection and storage practices. However, according to a 2021 review of the EMIS system in Nigeria, although staff across the country have been trained, this training has been insufficient, and there is a dearth of updated EdTech devices (such as computers) for proper data storage. This makes it difficult to obtain credible, valid, and reliable data at all levels (⬆Federal Ministry of Education, 2021). Furthermore, there also appear to be discrepancies in the existing data obtained at the state level, with the report highlighting that data provided by states to development partners or other stakeholders is sometimes different from that supplied to NEMIS (⬆Federal Ministry of Education, 2021). These discrepancies prevent a more nuanced understanding of state-by-state issues.

Limited EdTech infrastructure and access

Equitable access to EdTech infrastructure and digital devices is imperative for digital learning to reach all students, especially the most marginalised. In addition to the lack of data on EdTech access, the data that does exist highlights a distinct disparity between access and usage of EdTech in certain southern versus northern states. While there are multiple examples of state-level policies for EdTech usage, there continues to be only rudimentary infrastructure and inconsistent power supply at the school level in many states and regions of the country. For example, based on UBEC data from 2018, 25.23% of primary grade schools in the southwest have access to power, while only 14.29% of primary grade schools in the northwest have access to power. Similarly, 16.76% of primary grade schools in the southwest had access to computers, compared to 4.6% of primary grade schools in the northwest.

A USAID study highlights that due to poor public investment, Nigeria's energy infrastructure has not kept pace with the country's population growth (↑USAID, 2022). At present, around 85 million Nigerians do not have access to grid electricity (↑World Bank, 2021). At the national level, the same USAID report highlights that the median number of hours of electricity received by households was around eight hours per day. However, there are significant disparities between the north-central and southeast zones, which receive close to ten hours of electricity a day, while the northeast receives only around four hours of electricity a day (↑USAID, 2022).

EdTech for marginalised learners

Similar to other countries in the region, children with special educational needs and disabilities (SEND) often experience poor learning outcomes due to a lack of adequate facilities and resources such as accessible infrastructure, learning materials and teachers who are appropriately trained (↑USAID, 2022). In Nigeria, assistive technology is typically expensive and not easily obtainable, which often limits the mobility and access to education technology for children with SEND.

In addition, out-of-school children are an important consideration when discussing marginalised learners. There are several reasons, including ongoing conflict, economic barriers, and socio-cultural norms and practices, that contribute to there being over 10 million out-of-school children in the country (↑USAID, 2022). Nigeria currently contributes to around 20% of the global out-of-school children population. A discussion about the equitable distribution and access to EdTech in Nigeria must

include consideration of the impact and needs of out-of-school children (↑USAID, 2022).

Teacher digital skills

While the Nigerian National Commission for Colleges of Education has highlighted that all basic education teachers should be able to teach the ICT component of the basic education curriculum effectively to qualify for the Nigeria Certificate in Education, most teachers still lack the skills to use and integrate ICT into their teaching (↑USAID, 2022). While ICT standards for teacher trainers at the Colleges of Education are clearly outlined, a 2019 study highlights that there is a disconnect between curricular goals and implementation (↑Egede & Asabor, 2019).

Inadequate training in ICT skills for basic education teachers is linked to the poor use of EdTech materials in Nigerian schools (↑Egede & Asabor, 2019). While there is limited data on teacher digital skills, especially in the northern states of Nigeria, existing data highlights that teacher digital skills development is not prioritised, especially in rural and marginalised communities (↑USAID, 2022). A few reasons for this include lack of EdTech infrastructure, high cost of EdTech devices and attitudes of teachers towards acquisitions of EdTech skills (↑Egede & Asabor, 2019).

Key research gaps on EdTech

There are key research gaps that were identified during this scan. First, there is a paucity of research around the implementation of various federal and state policies. While multiple states in Nigeria have created EdTech policies and plans, there seems to be limited research and data on key implementation challenges and opportunities.

Second, while this rapid scan highlights several medium-scale, state-level EdTech interventions, there is a gap in research around the evidence and impact of these interventions. Examples of this include federal and state-owned initiatives such as Ignite and Inspire and, in Kaduna, the state government e-learning platform (at the time of writing the website was no longer accessible). There is limited public information on the number of users, content accessed, and whether it is still actively being used. Additionally, there is little information on how to integrate these initiatives into the wider education system.

Improving educational outcomes is hampered by poor availability and use of data for effective decision-making. These key research gaps and

questions are a significant challenge as it hinders the ability for strong data-based decision-making.

5.2 Opportunities

Addressing learning losses using EdTech

Along with many other resources that outline the education landscape in Nigeria, this rapid scan highlights key learning challenges and losses, which have been further exacerbated by the Covid-19 pandemic. The term 'learning losses' highlights the decline of knowledge or skills related to gaps in formal education (↑Wyss & Myers, 2022). Prior to the Covid-19 pandemic, much of what was understood about learning losses related to disruptions to formal schooling, such as students dropping out of school, teacher strikes, or interruptions caused by natural disasters and crises (↑Wyss & Myers, 2022). More recently, 'learning losses' has also referred to the decline in knowledge and skills due to the education disruptions caused by the Covid-19 pandemic (↑Wyss & Myers, 2022). Understanding learning losses is imperative to informing returns to school and is a critical step towards actioning mitigation measures and learning recovery plans.

While multiple EdTech interventions have been introduced as immediate responses to the Covid-19 pandemic, there is an opportunity to ensure that they are sustainable and can be used by learners and teachers even after the pandemic. For example, a recent review undertaken on technology-supported personalised learning, (↑Major & Francis (2020) found that this can not only enhance learning outcomes but also support Teaching at the Right Level (TaRL).[16] There are examples of when digital personalised learning (DPL) tools have been shown to enable a moderately positive impact on the learning of maths and literacy(↑Major & Francis, 2020). DPL is seen to offer an accessible means by which learners can access instructional materials that are capable of enhancing learning outcomes (↑Major & Francis, 2020). DPL tools have also been shown to improve literacy and numeracy outcomes for out-of-school learners (↑Plaut, 2024) and for narrowing the learning gap between rural and urban learners (↑Bai et al., 2018).

Given the significant infrastructure and hardware constraints in Nigeria (and the focus states), DPL tools will need to be thoughtfully designed for context. Some considerations would include ensuring that tools have

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[16] Teaching at the Right Level is an evidence-based educational strategy that assists children at primary and secondary levels to develop fundamental reading and arithmetic abilities, resulting in improved learning outcomes.

offline functionality, with features for both smartphones and basic mobile devices. While current conditions also limit implementation at scale, there are opportunities for DPL tools to be deployed strategically for maximum impact at local government level. For example, DPL tools have been shown to be most effective when implemented in alignment with approaches such as 'teaching at the right level' (TaRL) or as a supplement to classroom instruction. Taking in consideration the points raised above on hardware needs, DPL tools can be designed to support and advance accelerated learning programmes in operation in these states.

Supporting digital skills for teachers

During and after the Covid-19 pandemic, teachers across the world have been expected to learn both new digital skills and how to create safe and effective hybrid learning spaces for their students. Teachers in Nigeria are expected to do the same, while also navigating various other challenges, such as a lack of sufficient ICT infrastructure and training. Although current Federal Ministry of Education (FME) efforts, such as the creation of smart schools and the setting of digital resource centres have supported this task, there is still a lot to be done.

Most notably, there is a need for specific training to support teachers as they deliver lessons in blended learning environments. To facilitate this, landscape assessments aimed at better understanding specific teacher needs in various states are vital, as these assessments help to identify gaps in teachers' digital and pedagogical skills, determine the type of support needed, and understand where technology can be effectively leveraged. For example, between 2021 and 2022, EdTech Hub supported the Government of Tanzania in developing and implementing a technology-enabled teacher continuous professional development (TCPD) system (Chachage & Thakar, 2023). A key first step in this process was conducting a teacher needs assessment, which provided a comprehensive review of teachers' pedagogical needs and made recommendations that shaped the development of the TCPD model (Chachage & Thakar, 2023). For instance, among other things, the needs assessment revealed that teachers needed additional materials to support them in effectively employing technology to improve teaching and learning in the classroom. Such findings ultimately informed the development of the TCPD modules created by the Tanzania Institute of Education, which addressed a range of topics including digital skills, pedagogical skills, subject content knowledge, inclusive classroom practices, and teachers' health and well-being (Chachage & Thakar, 2023). Furthermore, to effectively

implement EdTech interventions such as DPL (discussed above), teachers need to be appropriately trained and equipped to play their respective roles; this is particularly important when the EdTech intervention requires teachers to use new digital skills or deviate from traditional teaching practices (↑Plaut, 2024).

Building stronger data-based decision-making practices

Data-based decision-making practices are essential for successfully managing education systems (↑Hua & Herstein, 2003). As a result, there is growing global interest in using education data and EMIS for effective planning and policymaking (↑Adam & Mitchell, 2024). However, the usefulness of EMIS in supporting evidence-based decision-making is hindered by factors such as fragmented or conflicting data, inaccurate data collected at the school level, slow feedback loops, and difficulties in interpreting data meaningfully (↑Adam & Mitchell, 2024). Additionally, EMIS are often not designed with the end user in mind, resulting in constraints such as limited technical capacity and lack of user buy-in (↑Adam & Mitchell, 2024). These challenges mirror those impacting strong data collection practices in Nigeria (↑Federal Ministry of Education, 2021).

In a 2024 EdTech hub learning brief, the authors outline best practices for designing and implementing EMIS in a useful way. They emphasise the need to prioritise both utility—ensuring the collection of relevant data for users at all levels of decision-making—and usability—ensuring that users can easily input the necessary data with minimal barriers (↑Adam & Mitchell, 2024). In addition, the authors highlight the need to incentivise data accuracy, build strong communities of practice to encourage ownership and accountability and the importance of focusing on usability for long-term engagement.

There is an opportunity to leverage lessons learnt through the implementation of strong data practices in neighbouring countries and to build on Nigeria's existing EMIS systems (at all levels).

Funding relevant and up-to-date evaluation and research

Opportunities to fund relevant and up-to-date evaluation and research are key to building a culture of data-based decision-making. While the rapid scan highlights key EdTech policies and interventions currently being implemented in Nigeria, there is limited evidence surrounding the impact

of both of these factors. Without relevant, up-to-date, and consistent data on the impact of policies and EdTech interventions, decision-makers might not have the required resources to estimate funding and other resource requirements at the systemic and school levels. For this reason, identifying and funding key evaluation needs for various interventions and thematic areas might be a key opportunity for both ministry and donor stakeholders within the EdTech landscape in Nigeria.

Supporting the evaluation of key EdTech initiatives that have been implemented since the start of the Covid-19 pandemic or those that aim to build digital skills for teachers can help to build a stronger culture around data-based decision-making. Similarly, funding or building evaluation practices of FME and state-level policies can serve as ways to bridge the gaps in knowledge around the difference between the creation and implementation of policies. Finally, supporting coordinating mechanisms and best practices for data collection at the federal level is another opportunity that could be explored. In addition to evaluating existing initiatives, there is a scope to contribute to the knowledge base and data repository of EdTech in Nigeria. Research around the use of EdTech in emergency settings, distance learning mechanisms, and the use of 'nudging' to increase participation in schools and target out-of-school children are all areas that could be explored, especially in the northern states of the country.

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