

Article

Promoting Smart Education in Nigeria

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Abstract: This paper explores the strategies of promoting smart education in Nigerian schools. Using secondary data that were collected from the online publications and print materials, the paper concluded that; provision of adequate funding, development of digital infrastructure in schools, formulation of national policy frameworks and national strategy, provision of training and support teachers in digital skills, development locally relevant digital content and curriculum, promotion affordable access to devices and internet and encouragement of innovation Through EdTech startups and research are some of the strategies to aid development of smart education in the Nigerian schools. Based on these points identified, the paper recommends the following: adequate investment in information communication technologies in all educational institutions. Constant retraining and retraining programme for all teachers and students. Provision of constant electricity and internet services in all educational institutions. Subsidizing ICT devices for educational institutions and students across Nigeria.

Keywords: Education, Smart Education, Schools, Technology, Artificial Intelligence

1. Introduction

Education is often described as the bedrock of any nation's progress—but in today's world, it's not just about having access to education; it's about having access to smart, innovative, and inclusive learning experiences. In Nigeria, millions of students still face challenges that make quality education difficult to attain—overcrowded classrooms, outdated teaching methods, limited learning materials, and an overall lack of digital resources. These issues are especially pressing in rural and underserved communities, where the gap between students' potential and the tools available to help them thrive continues to widen.

Smart education offers a new way forward. By integrating technology into the teaching and learning process—through tools like e-learning platforms, digital classrooms, artificial intelligence, and interactive content—we can create a more flexible, engaging, and student-centered educational experience. Beyond just replacing textbooks with tablets, smart education is about rethinking how knowledge is delivered, accessed, and applied in real life.

This research explores how Nigeria can adopt and promote smart education to bridge learning gaps, support teachers, and empower students across all regions. It looks at the current state of education, the opportunities that technology brings, and the practical steps needed to create a smarter, more inclusive educational system. At its heart, this study is about reimagining the future of learning in Nigeria—one where every student, no matter their background, has the tools they need to succeed in a rapidly changing world.

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Theoretical Framework

Diffusion of Innovation Theory (DOI)

The diffusion of innovation (DoI) theory is essentially a social process in which subjectively perceived information about a new idea is communicated and rests on the premise that a new idea, practice or object has perceivable channels, time and mode of being adopted by individual or organisations (Rogers)[1]. This theory explains how new ideas, technologies, or practices spread within a society or system over time. It focuses on how individuals and institutions adopt innovations at different rates.

Relevance to Smart Education in Nigeria:

-Smart education involves the use of digital tools, AI, cloud computing, smart classrooms*, and interactive platforms[2]. DOI helps analyze how teachers, students, and institutions adopt or resist these technologies. It identifies categories of adopters: innovators, early adopters, early majority, late majority, and laggards—useful for tailoring smart education policies.

Application Example:

Understanding why some schools adopt e-learning faster than others. Designing training and awareness campaigns to move more schools into the “early adopter or early majority” categories. Addressing barriers like infrastructure gaps, resistance to change, and lack of digital literacy[3].

Concept of Education

Education is the process of acquiring knowledge, skills, values, beliefs, and habits that help individuals grow intellectually, socially, and morally. It can take place in formal settings like schools and universities, or through informal experiences such as learning from family, peers, or the environment. At its core, education is more than just memorizing facts—it’s about learning how to think critically, solve problems, communicate effectively, and contribute meaningfully to society. It equips people not only for employment but also for life, helping them understand the world and their place in it.

Education comes in different forms:

Formal education: Structured learning in institutions like schools, colleges, and universities, often leading to certifications or degrees.

Informal education: Learning that happens outside of formal settings—through life experiences, family, community, or media.

Non-formal education: Organized learning outside the traditional school system, like vocational training, workshops, or online courses.

Concept of Smart Education

Smart education is an educational system that allows students to learn by using up-to-date technology and it enables students to study with various materials based on their aptitudes and intellectual levels” (Jang)[4]. Smart learning environments, sometimes used to refer to smart education, “represent a new wave of educational systems, involving an effective and efficient interplay of pedagogy, technology and their fusion towards the betterment of learning processes” (Shoikova et al)[5]. Smart education is a thoughtful integration of technology, digital tools, and innovative pedagogies into the entire school system (teaching, learning administrative processes) (Oladipo)[6]. According to Butt , smart education is “about providing personalized learning, anywhere and anytime. Moreover, they state that smart education is about taking learning outside the traditional classrooms; and is an activity that can be done anywhere and anytime”[7].

From the above, Smart education in this paper can be seen as a modern way of learning that uses technology to make education more engaging, flexible, and personalized for both students and teachers. Instead of relying only on chalkboards, paper textbooks, and one-size-fits-all lessons, smart education brings in digital tools like tablets, online

platforms, virtual classrooms, and even artificial intelligence to create a richer learning experience.

Imagine a student in a remote village in Nigeria who can now watch video lessons from top teachers, take quizzes on a mobile app, or join a virtual classroom with students from across the country. Or think about a teacher who can track each student's progress in real time and adjust lessons to suit different learning styles. That's the power of smart education. But it's not just about technology—it's about using that technology in meaningful ways. It's about making learning more interactive, helping students learn at their own pace, and giving teachers better tools to teach. Smart education opens doors for students who might otherwise be left behind, especially in places where traditional schools face challenges like overcrowding, lack of resources, or limited access to quality teaching. At its heart, smart education is about rethinking how we teach and learn—making education more inclusive, more connected, and better suited for the world we live in today.

Smart education refers to the use of technology in the education sector to enhance learning and teaching processes. It involves the use of various digital tools and applications, such as online learning platforms, interactive learning materials, and virtual reality simulations, to create a more engaging and effective learning experience for students. Smart education also includes the implementation of data analytics and artificial intelligence in educational institutions to personalize learning, track student progress, and improve academic outcomes. Smart education aims to modernize and optimize traditional educational practices through the use of technology[8].

Smart education plays a crucial role in shaping the future of education. It combines technology with traditional teaching methods to enhance the learning experience for students. By incorporating AI and other advanced tools, smart education can personalize the learning process, adapt to students' individual needs, and make learning more interactive and engaging. This leads to improved retention rates and a deeper understanding of the material being taught. Additionally, smart education prepares students for the constantly evolving job market by equipping them with the necessary skills to succeed in a technology-driven world. Furthermore, it also promotes accessibility to education, breaking barriers such as geographical limitations and allowing students from all backgrounds to access quality education. Smart education can greatly benefit both students and educators, making it an important aspect of modern education systems.

2. Materials and Methods

Promoting smart education in Nigeria is a position paper that adopted a systematic literature review-based method. The method allows to collect and review the related previous literature from various online sources. With the aid of digital platform, the researcher collected secondary information to generate knowledge on this topic from 2015-2025. The position paper followed qualitative narrative design method. The researcher has visited different online sites to collect the previous literature and analyze the literatures on Promoting smart education in Nigeria. The previous findings are critically analyzed and presented in different themes promoting smart education in Nigeria. (Adapted from Ogunode)[9].

Inclusion and exclusion criteria

Inclusion

This output of the literatures on Promoting smart education in Nigeria presents an in-depth study and result the can infer conclusion on the topic. The study includes; online publication; conference paper, journals sorted from from reputable international journals such as CEON, Elsevier, Hindawi, JSTOR, IEEE, Learn Techlib, SAGE, Nebraska and Springer[10].

Exclusion

Also, the literature review excludes information from edited books, preprints, monographs, information below 2015 and book chapters (Adapted from Ogunode).

3. Results and Discussion

Improve Digital Infrastructure in Schools

A foundational step toward smart education is equipping schools with the basic digital infrastructure—such as reliable electricity, internet connectivity, computers, tablets, and smart boards[11]. Ogunode noted that many Nigerian schools, particularly in rural areas, lack power supply or internet access. Without these, digital learning remains out of reach. Oladipo suggested that investment in solar-powered ICT hubs or satellite internet (e.g., Starlink) can provide off-grid solutions. Olaopined that Public-private partnerships (PPPs) can help bridge funding gaps, where government collaborates with tech companies or NGOs to supply and maintain infrastructure. Oladipo concluded that improving digital infrastructure levels the playing field and gives students and teachers access to modern educational tools, no matter their location[12].

Provision of Train and Support Teachers in Digital Skills

Teachers are central to any education system. For smart education to succeed, teachers must be trained, confident, and supported in using digital tools submitted that regular training and professional development programs should focus on using smart tools like interactive whiteboards, learning management systems (LMS), educational apps, and AI-powered resources. Training should go beyond "how to use tech"—it should show how technology can enhance teaching methods and student engagement[13]. Establishing ICT support units in schools or communities can provide ongoing help for teachers. Empowered teachers can more effectively deliver content, monitor student progress, and adapt their teaching methods to diverse learning needs.

Develop Locally Relevant Digital Content and Curriculum

Technology is only effective when paired with quality, relevant content. Smart education requires digital learning materials tailored to Nigeria's curriculum, language, and cultural context. Develop e-textbooks, video lessons, simulations, and gamified learning tools based on the Nigerian curriculum. Include local languages and culturally familiar examples to enhance understanding and relatability. Government agencies like the Nigerian Educational Research and Development Council (NERDC) should lead in curating and approving content[14]. When students see their culture, environment, and language reflected in learning materials, it improves engagement and comprehension.

Promote Affordable Access to Devices and Internet

Access to smart education tools must be affordable and equitable to avoid deepening the digital divide between rich and poor students. Government can work with telecom providers to offer subsidized data plans for students and schools. Provide low-cost devices like tablets or smartphones with pre-loaded educational content for students in underserved areas. Explore device-sharing models or community digital learning centers to reduce costs[15]. Ensuring that all students, regardless of income or location, can access smart education tools helps to democratize learning opportunities.

Establish Strong Policy Frameworks and National Strategy

Without a clear policy direction, efforts to implement smart education can become fragmented and unsustainable. The Federal Ministry of Education should develop a National Smart Education Strategy that outlines goals, timelines, funding models, and roles of stakeholders[16]. Policies should address data privacy, content quality, digital literacy benchmarks, and monitoring systems. Include measurable KPIs and encourage collaboration among federal, state, and local governments. A unified national policy

ensures that smart education initiatives are coordinated, consistent, and scalable across the country.

Encourage Innovation Through EdTech Startups and Research

Nigeria's vibrant tech ecosystem can be a powerful driver of smart education if properly supported and aligned with educational needs. Support local EdTech startups through grants, innovation hubs, and access to pilot programs in public schools[17]. Foster collaboration between universities, researchers, and tech developers to create context-specific solutions. Encourage innovations like mobile learning apps, AI tutors, and offline-compatible platforms for rural areas. Homegrown innovations are more likely to be affordable, culturally relevant, and sustainable. They also create local job opportunities and foster economic growth.

Findings

The paper revealed that provision of adequate funding, development of digital infrastructure in schools, formulation of national Policy Frameworks and National Strategy, provision of training and support teachers in digital skills, development locally relevant digital content and curriculum, promotion affordable access to devices and internet and encouragement of innovation Through EdTech Startups and Research are some of the strategies to aid development of Smart education in the Nigerian schools.

4. Conclusion

The integration of smart education into Nigeria's educational system is not just a technological upgrade—it is a necessary transformation that can reshape how knowledge is delivered, accessed, and applied in a rapidly evolving world. As the country faces persistent challenges such as overcrowded classrooms, limited teaching resources, and unequal access to quality education, smart education offers a powerful solution to bridge these gaps and create a more inclusive, dynamic, and effective learning environment.

However, for this transformation to be successful, it must be guided by clear strategies and collective commitment. Investment in digital infrastructure, teacher training, and the development of locally relevant digital content are essential first steps. Equally important is the need for strong policy frameworks, equitable access to devices and connectivity, and a supportive ecosystem that encourages innovation through partnerships with EdTech startups and research institutions.

Ultimately, smart education is about empowering both learners and educators with the tools and opportunities to thrive in the 21st century. By embracing this shift, Nigeria can not only improve its educational outcomes but also equip its young population with the skills and mindset needed to compete and succeed in the global digital economy. The time to act is now—smart education is no longer a luxury, but a critical pathway to national development and social transformation.

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