

## Leveraging Artificial Intelligence for Inclusive Education in Nigeria to Enhance Educational Opportunities for Diverse Learners

<sup>\*1</sup>Nathaniel Samuel, <sup>2</sup>Olutoye Kunle Olasedidun, <sup>3</sup>Adekemi Yewande Karimu, <sup>4</sup>Rashidat Sade Ganiyu, <sup>5</sup>Ibrahim Olatunde Salawu & <sup>6</sup>Olayemi Olusegun Olalude

<sup>\*1,2,4,5&6</sup>Department of Educational Technology, Faculty of Specialised and Professional Education, Emmanuel Alayande University of Education Oyo, Oyo State, Nigeria **Email:** nathanielsamuel09@yahoo.com<sup>\*1</sup>; olutoyeolasedidun@gmail.com<sup>2</sup>; ganiyu.sade@gmail.com<sup>4</sup>; tundesalawu2003@gmail.com<sup>5</sup> & olaludeolayemi@gmail.com<sup>6</sup>

<sup>3</sup>Leeds Trinity University, Faculty of Business, Computing and Digital Industries, School of Computer Science, United Kingdom: **Email:** 2317444@leedstrinity.ac.uk

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### Abstract

*This paper x-rayed the transformative potential of Artificial Intelligence (AI) in promoting inclusive education within the Nigerian context. As Nigeria is faced with persistent perennial challenges in providing accessible and equitable education for all learners especially those with special challenges and those with diverse cultural and linguistic backgrounds; there is need to encourage leveraging AI as potent strategy to bridge educational disparities. The study adopts a multidimensional perspective in focusing on three central pillars: the integration of assistive technologies, the advancement of personalized learning pathways, and the fostering of accessibility innovations. These components are discussed in relation to contextual variables such as teacher digital competence, infrastructural readiness, policy environment, and socioeconomic disparities that influence adoption and effectiveness of AI tools in Nigerian classrooms. Supported by the construct of inclusive pedagogy, a conceptual framework was proposed to illustrate how AI enhance learners' participation, autonomy and achievement. By contextualizing global innovations within Nigeria's unique socio-cultural and infrastructural realities, practical and policy-relevant insights are proffered on how AI can be harnessed to supplement existing educational practices and to fundamentally reshape them toward greater equity and inclusion. It was suggested that stakeholders should collaborate on inclusive and relevant AI solutions.*

**Keywords:** Artificial Intelligence, Inclusive Education, Assistive Technologies, Personalized Learning, Accessibility Innovations

### Introduction

Education is a fundamental human right and a cornerstone for national development when judiciously access with emerging educational technologies.

Educational technology has been known for playing a transformative role in bridging the digital divide, promoting equitable access to technology-enhanced learning, improving educational outcome of students irrespective of their gender and socio-economic backgrounds; supporting digital literacy, interactive learning and skill acquisition (Adenubi *et al.*, 2025). Samuel (2021) averred that traditional approaches to teaching and learning are gradually losing their effectiveness in engaging learners and fostering optimal educational outcomes. The continuous global advancement in learning made educational institutions to increasingly adopt variety of methods, strategies, and media to enhance pedagogical experiences. This dynamic nature of education and engagement of newer technologies brought about innovative communication, teaching and learning process to leverage the evolving needs of students (Adenubi *et al.*, 2024).

However, the concept of inclusive education, which advocates for equitable participation of all learners regardless of their cognitive, physical, linguistic, or socio-economic conditions, which remain as a significant challenge in many developing countries, especially Nigeria (UNESCO, 2021; Adebayo, 2022). Despite national and international policy commitments such as Nigeria's National Policy on Special Needs Education as contained in Federal Republic of Nigeria (2008) and Sustainable Development Goal 4 (which aims to ensure equitable and inclusive quality education for all), the implementation remains far from adequate. Nigeria's educational landscape is marked by stark disparities in access, participation, and outcomes due to perennial challenges facing the nation educational system. Some of these challenges are: over 20 million out-of-school children (UNICEF, 2023), poor infrastructure, limited teacher capacity and insufficient provision and of learning tools that are tailored for special needs learners reflect systemic exclusion (UBE Commission, 2020; Okebukola, 2020).

According to (Samuel, 2021), Nigerian learning institutions have grappling with inadequate digital infrastructure facilities, inadequate teacher training and insufficient policy support for teacher professional growth. As a result these perennial challenges, Nigerian education system is at risk of falling further behind in achieving equitable and quality education for all and dry. Moreover, the vast digital divide between urban and rural communities impedes equal access to innovative educational technologies that can support inclusive practices. Recent technological advancements, especially in the deployment of Artificial Intelligence (AI) in facilitating, offer promising avenues to transform

education delivery by supporting personalized learning, real-time assessment, language translation, and assistive technologies for learners with disabilities (Alabi, Ojo & Musa, 2023). AI-powered tools can customize instructional content based on individual learner profiles, ensuring that no one is left behind (Adedoyin & Soykan, 2020). For instance, speech-to-text, text-to-speech, predictive text applications, emotion detection, and AI-driven reading support tools can enhance learning for visually and hearing-impaired students (Adu et al., 2021).

However, the integration of AI for inclusive education in Nigeria remains under-explored. While private institutions and international schools are experimenting with AI and assistive learning technologies, the majority of Nigerian public schools lack the infrastructure, policy frameworks, and skilled workforce to adopt such innovations effectively (NERDC, 2021; NCC, 2022). Additionally, little research exists on how AI solutions can be customized to fit Nigeria's multi-lingual, multicultural, and infrastructurally disadvantaged educational system.

Despite global advancements in AI-driven inclusive education, empirical and contextual studies exploring the integration of these technologies in the Nigerian educational system are sparse. Specifically, the following critical research gaps exist: Limited contextual evidence on the effectiveness of AI-powered assistive technologies for learners with disabilities in Nigerian primary, secondary, and tertiary education settings (Adebayo, 2022; Oyelekan & Agagu, 2020); lack of comprehensive studies on how AI-driven personalized learning tools can be integrated into Nigerian curricula, especially in low-resource and multilingual learning environments (Ajayi, 2020; Alabi et al., 2023); few frameworks exist that link accessibility innovations (e.g., speech recognition, screen readers, localized language AI) to Nigeria's inclusive education goals - most current discussions are policy-based but not technologically focused (NERDC, 2021); limited exploration of the readiness of Nigerian teachers, administrators, and learners to adopt AI tools for inclusion, in terms of digital competence, infrastructural access, and curriculum alignment (Adedoyin & Soykan, 2020); and scant attention has been given to rural and underserved communities, where the inclusive potential of AI could be most transformational but where systemic neglect and infrastructural limitations are most severe (UNICEF, 2023; UBE Commission, 2020).

Moreover, despite Nigeria's policy commitment to inclusive education through frameworks such as the National Policy on Education (FRN, 2013) and the National Policy on Special Needs Education (2008), the practical realization of inclusive education remains elusive. Millions of Nigerian learners, particularly those in rural communities, those with special challenge, and those from economically disadvantaged backgrounds, continue to face significant perennial challenges to quality education due to inadequate infrastructure, poorly trained teachers, and lack of accessible learning materials (UNESCO, 2021; UBE Commission, 2020). The prevalence of out-of-school children in Nigeria currently estimated at over 20 million, which seemingly be the highest in the world - is a stark indicator of systemic exclusion (UNICEF, 2023). Many of these children are either affected by insecurity, disability, or socio-economic challenges, underscoring the urgent need for innovative approaches to deliver equitable learning experiences. Additionally, learners with special challenges or disabilities are often excluded from mainstream education due to lack of trained personnel, limited assistive technologies and non-adaptive curricula (Adedoyin & Soykan, 2020; Adebayo, 2022).

Most public schools in Nigeria do not have adequate technological infrastructure facilities required to support special challenges like hearing-impaired, visually impaired, or cognitively challenged students (Oyelekan & Agagu, 2020); even non-physically challenge children in the rural areas are not enjoying the engagement of newer technologies. This situation further widens the educational gap and reinforces systemic inequities. Moreover, Nigeria's linguistic and cultural diversity - home to over 500 languages compounds the challenge of delivering personalized and inclusive instruction. English-centric digital learning tools marginalize a significant portion of learners who are more proficient in indigenous languages (Ajayi, 2020). The absence of localized, inclusive content exacerbates learning difficulties, especially at the foundational level.

The advent of Artificial Intelligence (AI) offers unprecedented opportunities to overcome these barriers. AI-powered systems, including assistive technologies, adaptive learning platforms, and accessibility tools, have the potential to bridge gaps in access, personalize learning, and support learners with special needs (Okebukola, 2020; Alabi, Ojo & Musa, 2023). However, AI adoption in Nigeria's education sector is still at a nascent stage, with low integration in classroom settings, minimal awareness among educators, and

lack of supportive digital infrastructure (Adu, Olaleye & Adefeso, 2021). The digital divide persists between urban and rural areas, limiting the potential reach of AI solutions. Many rural schools lack electricity, internet connectivity, and basic digital devices, making equitable deployment of AI-driven solutions challenging (NCC, 2022; NERDC, 2021). Additionally, teachers often lack the necessary digital competence and inclusive pedagogical training to effectively utilize AI tools for differentiated instruction (Adedoyin & Soykan, 2020).

Elucidating on these challenges, it is imperative to explore how AI-enabled assistive technologies, personalized learning systems, and accessibility innovations can be leveraged to enhance educational opportunities for diverse learners in Nigeria. Without a strategic framework for integrating AI into inclusive education practices, the nation risks reinforcing existing disparities and failing to meet its education-for-all obligations under global agreements such as SDG 4 (UNESCO, 2021). Therefore this study explores the potential of leveraging AI for inclusive education in Nigeria by focusing on the intersection of assistive technologies, personalized learning, and accessibility, innovations, current level of readiness, barriers to implementation, and opportunities for scaling AI-enabled inclusive practices across educational settings in Nigeria.

In response to the persistent challenges undermining the inclusivity of Nigeria's educational system, it is pertinent to bridge critical gaps through a multifaceted approach of using the engagement of Artificial Intelligence for inclusive education in Nigeria learning institutions to enhance educational opportunities for diverse learners. This study proposes a contextual implementation model, articulated through a conceptual framework that demonstrates how AI-enabled tools can effectively be adapted to Nigeria's inclusive education landscape, taking into account infrastructural limitations, linguistic diversity, and socio-cultural complexities. Secondly, policy and practice alignment will be emphasized by offering actionable recommendations to inform national strategies for AI integration in inclusive education, thereby addressing disconnect between existing educational policies and the rapid evolution of technology. Furthermore, preparedness of educators, administrators and policymakers on digital integration and pedagogical readiness seemed questionable. Therefore, periodic assessments of educational stakeholders' capacity will help in identifying specific training

requirements and infrastructural gaps that are necessary for effective AI deployment in inclusive settings. The principle of equity through innovation by exploring scalable, cost-effective, and locally relevant AI solutions aimed at reducing educational disparities particularly for learners with disabilities and those in underserved or marginalized communities becomes very necessary.

### **Justification for the Inclusiveness of the Framework into the Nigerian Educational System**

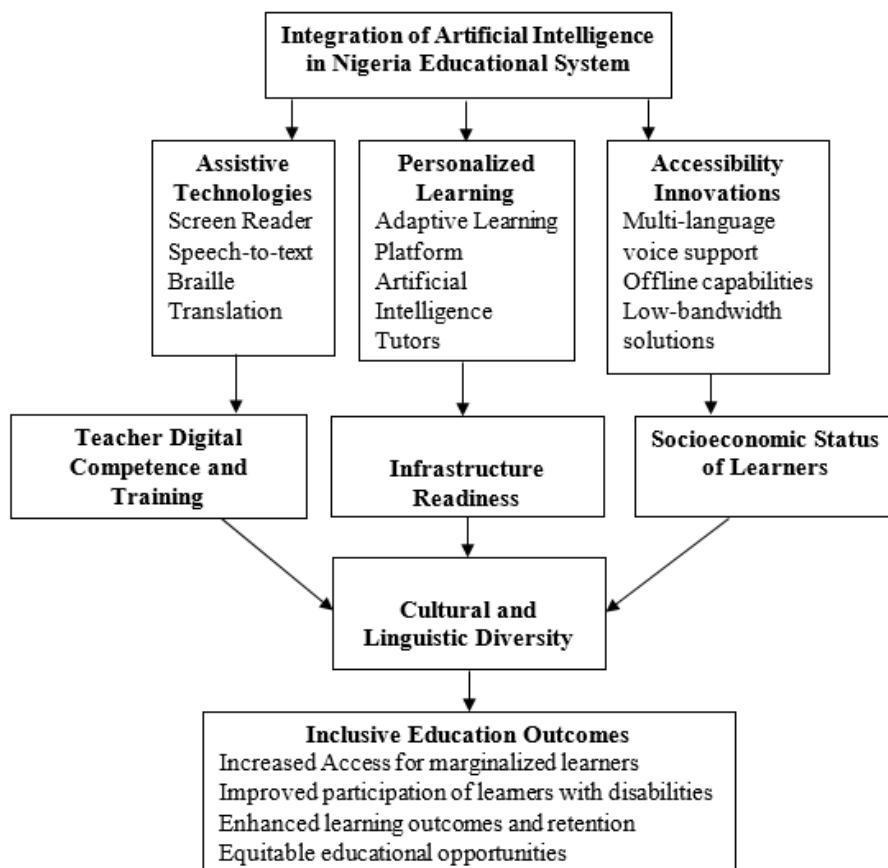
The framework's inclusiveness was justified based on the following constructs authorities:

- a. **Policy Alignment:** The proposed AI-integrated framework aligns with Nigeria's national education and digital policies while addressing their gaps in inclusivity. It complements the National Digital Economy Policy (2020–2030) by embedding equity for marginalized learners and supports inclusive goals of the National Policies on Education (2013) and ICT in Education (2019). Globally, it reflects the mandate of SDG 4 for inclusive education. Empirical evidence (Afolabi et al., 2021; Adebayo & Omodan, 2022) reinforces the need for policy-aligned, localized AI solutions (Alhassan, 2020) to reduce educational inequities.
- b. **Equity:** The framework embeds equity by prioritizing adaptive, accessible AI tools that serve learners with disabilities and underserved populations. This ensures inclusive access, participation, and outcomes, in line with UNESCO (2020) and World Bank (2020) recommendations. In Nigeria's context of infrastructural and socio-economic disparities, such targeted interventions are vital for achieving educational justice.
- c. **Access:** AI-powered mobile tools expand learning opportunities for students in remote and low-income areas by overcoming physical and financial barriers. With increasing mobile penetration in Nigeria (NCC, 2022), such tools ensure broader reach, especially where traditional infrastructure is lacking (Olaniyi et al., 2021).
- d. **Relevance:** The framework integrates local languages, indigenous knowledge, and culturally responsive content to reflect the lived

experiences of Nigerian learners. This boosts learner engagement and contextual understanding (Ajayi, 2020; Adewumi & Olatunji, 2021).

- e. **Feasibility:** By leveraging low-cost and scalable AI applications that function in resource-constrained environments, the framework ensures practical implementation in underserved schools (Adu et al., 2021; Alabi et al., 2023).
- f. **Sustainability:** Long-term impact is achieved through AI-driven automation, teacher augmentation, and alignment with national education policies, ensuring continuity and systemic integration (Okebukola, 2020; Adedoyin & Soykan, 2020).
- g. **Empowerment:** The framework enhances teacher digital literacy and pedagogical effectiveness while promoting learner autonomy and critical thinking through intelligent tutoring and personalized feedback (Oyelekan & Agagu, 2020; Yusuf & Onasanya, 2021).
- h. **Diverse Learner Needs:** With Nigeria hosting the largest population of out-of-school children in Sub-Saharan Africa—many of whom have disabilities—the framework ensures inclusive approaches that address cognitive, physical, and socio-economic learning differences (UNICEF, 2023).
- i. **Digital Divide:** Marked disparities in digital access between urban and rural areas necessitate offline-capable, AI-driven solutions that are cost-effective and adaptable to varying levels of connectivity (Okebukola, 2020).
- j. **Language Barriers:** AI-powered speech synthesis and translation tools are critical in navigating Nigeria’s multilingual context, ensuring that language does not hinder educational access and comprehension (Ajayi, 2020).

The proposed conceptual framework for the integration of artificial intelligence in Nigerian educational system is presented hereunder, showing the key constructs and variables for the inclusiveness and inclusive education outcomes from it.



**Figure 1:** Propose Conceptual Framework for Integrating Artificial Intelligence in Nigerian Educational System

Figure 1 presents a conceptual framework that illustrates how Artificial Intelligence (AI) can be integrated into Nigeria’s education system to support inclusive education by focusing on assistive technologies, personalized learning, and accessibility innovations, while addressing contextual challenges such as infrastructure deficits, teacher readiness, language diversity, and socioeconomic disparity. It illustrates a context-aware model for integrating Artificial Intelligence (AI) in Nigeria’s educational system, with a strong emphasis on inclusion, equity, and cultural relevance. The key components of the framework are contextual discussed hereunder:

1. Central Focus: Integration of Artificial Intelligence in Nigeria’s Educational System: at the core of the framework is the integration of AI into education and not just as a technological enhancement, but as a strategic approach to

address systemic barriers, foster equity, and improve learning outcomes, especially for marginalized populations.

## 2. Key Pillars of Integration

- (1) **Assistive Technologies:** These tools (e.g., screen readers, speech-to-text, Braille support) are crucial for learners with disabilities, ensuring that AI does not widen existing inequalities but instead removes access barriers.
- (2) **Personalized Learning:** AI enables adaptive learning platforms and intelligent tutors that tailor instruction to individual learner needs, pacing, and abilities. This personalization is vital in Nigeria's diverse educational landscape, where learners often face overcrowded classrooms, under-resourced schools, and language barriers.
- (3) **Accessibility Interventions:** Features such as multi-language voice support, offline capabilities, and low-bandwidth optimization directly respond to infrastructural and socio-economic disparities across Nigeria. These interventions help ensure AI solutions are inclusive, not exclusive.

## 3. Supporting Conditions for Success

- i. **Teacher Digital Competence and Training:** Teachers are pivotal in AI integration. Their digital literacy, willingness to innovate, and ongoing professional development are central to ensuring that AI tools are effectively and ethically deployed in the classroom.
- ii. **Infrastructure Readiness:** Reliable power, internet access, and devices form the technological backbone. Without infrastructure support, AI tools may fail to scale or may exacerbate the urban-rural digital divide.
- iii. **Socioeconomic Status of Learners:** AI tools must be designed to function in low-income environments, ensuring students from all backgrounds can participate. This entails low-cost devices, subsidized platforms, and public investments in digital equity.

4. **Cross-Cutting Consideration: Cultural and Linguistic Diversity:** A key cross-cutting consideration in the framework is Nigeria's cultural and

linguistic diversity. Given the country's multilingual and multicultural context, AI solutions must support local languages, region-specific content, and culturally relevant pedagogy. This approach not only fosters inclusivity but also reinforces learners' identities and enhances their engagement with the educational process.

5. Expected Inclusive Education Outcomes: The framework envisions inclusive education outcomes that prioritize equity and accessibility. It aims to increase access for marginalized groups, improve learning outcomes for students with disabilities, and enhance teacher support through AI-driven tools. Additionally, it promotes equitable participation in digital education, ensuring that all learners regardless of ability, location, or background benefit from technology-enhanced learning. These outcomes align with Nigeria's National Policy on Education (2013), the ICT in Education Policy (2019), and the global objective of SDG 4, which advocates for inclusive, equitable, and quality education for all.

This AI integration framework is strategic, inclusive, and contextually grounded, offering a realistic pathway to transform Nigeria's educational system. It acknowledges local constraints while leveraging AI's potential to bridge access gaps, personalize learning, and promote social equity especially for disadvantaged groups. Its success, however, hinges on policy support, stakeholder collaboration, and sustained investment in infrastructure and capacity-building.

### **Description of the Synergistic Interrelationships**

The proposed framework for integrating Artificial Intelligence (AI) into Nigeria's educational system reveals a layered, interdependent structure aimed at fostering inclusive education. At its core, AI integration activates three interlinked pathways: assistive technologies, personalized learning, and accessibility innovations, all contributing to enhanced inclusion across diverse learner groups.

AI-powered assistive tools like screen readers and speech-to-text applications help bridge accessibility gaps for students with disabilities, particularly in underserved and infrastructure-deficient areas where traditional support systems are lacking (Adebayo, 2022). Personalized learning, driven by AI, adapts content to individual learner profiles and paces, a critical intervention in Nigeria's overcrowded classrooms where individualized instruction is rare.

(Alabi et al., 2023). Meanwhile, accessibility innovations such as multilingual translation and voice-enabled apps address Nigeria's vast linguistic diversity, mitigating language barriers and affirming cultural identities (Ajayi, 2020).

However, several moderating factors shape the potential impact of these AI-driven pathways. Teacher digital competence is vital, as the effectiveness of AI tools depends on educators who are confident and digitally literate—an area still deficient in many schools (Oyelekan & Agagu, 2020). Infrastructure constraints, including unreliable electricity and poor internet access, remain significant obstacles, particularly in rural regions (NCC, 2022; UNICEF, 2023). The presence of enabling policies like the ICT in Education Policy (2019) and the Revised National Policy on Education (2013) is crucial for sustainable implementation (NERDC, 2021). Socio-economic disparities also influence access to AI tools, risking the deepening of existing inequalities without public support. Cultural acceptance is another key factor; local communities must perceive AI as a relatable, beneficial innovation rather than a foreign imposition. In essence, the framework highlights AI as a powerful, synergistic driver of inclusion not in isolation but when reinforced by policy, infrastructure, capacity building, and cultural relevance to expand equitable learning opportunities for all, particularly the marginalized. The Conceptual Logic Model for Leveraging AI for Inclusive Education in Nigeria illustrates a flow of interconnected components designed to drive equity and access in education and comprises the following layers:

**Table 1: Logic Model for Leveraging AI for Inclusive Education in Nigeria**

Components	Description
↓ <b>Inputs</b>	<ul style="list-style-type: none"> <li>- Government policy support (e.g., Nigeria Digital Economy Policy)</li> <li>- Investment in AI tools and assistive technologies</li> <li>- Teacher training programs</li> <li>- Partnerships with EdTech companies and NGOs</li> <li>- Reliable ICT infrastructure development</li> </ul>
↓ <b>Activities</b>	<ul style="list-style-type: none"> <li>- Development and deployment of AI-powered educational tools</li> <li>- Training educators in the use of AI and assistive technologies</li> <li>- Designing AI tools to support multiple Nigerian languages and disabilities</li> <li>- Integrating UDL principles in content creation</li> </ul>
↓ <b>Outputs</b>	<ul style="list-style-type: none"> <li>- AI-assisted learning platforms tailored for diverse learners</li> <li>- Availability of assistive tools in classrooms</li> <li>- Educators with digital competence</li> <li>- Increased access to learning materials via AI platforms</li> </ul>
↓ <b>Short-Term Outcomes</b>	<ul style="list-style-type: none"> <li>- Increased teacher capacity to use inclusive digital tools</li> <li>- Enhanced learner engagement and participation</li> <li>- Greater access for students with disabilities and marginalized communities</li> </ul>
↓ <b>Long-Term Outcomes</b>	<ul style="list-style-type: none"> <li>- Reduced educational inequality</li> <li>- Improved retention and academic performance for diverse learners</li> <li>- Mainstreaming inclusive education practices in Nigeria</li> <li>- Achievement of SDG 4: Quality Education for All</li> </ul>

As shown in Table 1 in the conceptual logic model for leveraging AI for inclusive education in Nigeria, to effectively integrate Artificial Intelligence into Nigeria’s educational system for inclusive outcomes, several foundational inputs are required. These include supportive government policies such as the Nigeria Digital Economy Policy, sustained investments in AI-driven tools and assistive technologies, comprehensive teacher training programs, partnerships with Educational Technology companies and non-governmental organizations, and the establishment of reliable ICT infrastructure. Based on these inputs, core activities would involve the development and deployment of AI-powered educational platforms, the training of educators to use inclusive AI technologies, the creation of AI tools that support Nigeria’s diverse languages and disabilities, and the integration of Universal Design for Learning (UDL) principles into digital content development. These activities are expected to yield tangible outputs such as the availability of AI-assisted learning platforms tailored to diverse learner needs, widespread access to assistive tools in

classrooms, a digitally competent teaching workforce, and increased access to learning materials through AI-enhanced systems.

In the short term, these outputs would lead to increased teacher capacity for inclusive teaching, enhanced learner engagement and participation, and improved access to quality education for students with disabilities and marginalized groups. Over the long term, these efforts will contribute to a reduction in educational inequality, better learning outcomes and retention rates, the mainstreaming of inclusive education practices across Nigeria, and meaningful progress toward the realization of Sustainable Development Goal 4 - ensuring inclusive and equitable quality education for all.

### **Derivable Educational Outcomes for the Inclusiveness of the Framework into Nigerian Educational System**

The derivable educational outcomes from the inclusiveness of the AI-based framework into the Nigerian educational system, will facilitates the framework's provisions and context for:

1. **Improved Access to Quality Education for Marginalized Learners:** AI-driven assistive technologies like screen readers and braille converters enable learners with disabilities to access curriculum content effectively (World Bank, 2020). Similarly, mobile-friendly, low-bandwidth applications ensure inclusion of learners in rural and underserved areas (Yusuf & Onasanya, 2021). These initiatives align with Nigeria's national policy of inclusive education and the goal of leaving no learner behind (UNICEF, 2021; Adebayo, 2022).
2. **Personalized Support for Diverse Learning Needs:** The framework leverages AI personalization engines to deliver individualized learning paths for underperforming, over-age, and accelerated learners, thereby enhancing academic outcomes and improving retention across diverse educational backgrounds (Akinsolu & Oke, 2022).
3. **Alternative Learning Channels in Resource-Constrained Environments:** AI-powered virtual tutors and chatbots will help address teacher shortages by supplementing classroom instruction (UBEC, 2020). Offline-capable tools and solar-powered devices ensure learning continuity in off-grid, underserved areas (Adu et al., 2021), while automated assessments ease teacher workload and enhance learner engagement (Ngugi, 2022).

4. **Strengthened Teacher Competence for Inclusive and Digital Pedagogy:** Real-time analytics dashboards and AI-driven professional development platforms will enhance teachers' skills and instructional strategies (Oyelekan & Agagu, 2020; Okonkwo, 2021). This equips them to deliver adaptive, inclusive lessons tailored to individual learner needs, thereby improving overall pedagogical effectiveness (Adedoyin & Soykan, 2020).
5. **Greater Linguistic and Cultural Inclusivity in Learning:** AI-powered voice-to-text and translation technologies will enable the integration of indigenous languages into learning delivery (Adewumi & Olatunji, 2021). This, combined with culturally relevant and context-sensitive content, will enhance comprehension, reinforce learner identity, and promote community acceptance of digital learning platforms (Ajayi, 2020).
6. **Narrowing the Digital Divide through Accessible Technology:** By prioritizing mobile-first, low-data, and offline-compatible AI applications, the framework ensures inclusive access for learners in low-income and rural communities (Olaniyi et al., 2021; Oyedemi & Salawu, 2023). This approach democratizes digital learning, providing equal opportunities for all learners to benefit from technology.
7. **Data-Driven Inclusion and Responsive Policy Implementation:** AI-enabled analytics will identify at-risk learners and predict learning challenges in real time (UNESCO, 2020), while disaggregated data on performance and participation will inform evidence-based planning, equitable resource allocation, and targeted educational interventions (NERDC, 2021; Okebukola, 2020; Nwagwu, 2021).

These outcomes collectively will establish a systemic transformation that aligns with Nigeria's National Policy on Education (2013), the ICT in Education Policy (2019), and SDG 4 goals of inclusive and equitable quality education for all. The framework doesn't merely provide technological solutions but reimagines the architecture of inclusion through AI-enhanced equity, access, and personalization in education.

## **Conclusion**

This study proposed a conceptual framework for integrating Artificial Intelligence (AI) into Nigeria's education system to promote inclusive education. It identifies AI as a transformative tool that can enhance access,

equity, and quality for diverse learner populations—particularly those with disabilities, in rural areas, and from low socio-economic backgrounds. The framework highlights three mediating pathways through which AI fosters inclusivity: assistive technologies, personalized learning tools, and accessibility innovations. These AI-driven solutions support learners with special needs, adapt instruction to individual abilities, and overcome linguistic, infrastructural, and connectivity barriers. However, the effectiveness of AI integration is influenced by key moderating factors: teacher digital competence, infrastructural readiness, policy support, socio-economic disparities, and cultural acceptance. These contextual realities must be addressed to ensure the sustainability and equity of AI implementation. A logic model was developed to outline the inputs (policy support, infrastructure, training), activities (tool development, capacity building), and outcomes (enhanced access, improved retention, reduced inequality). Ultimately, the framework supports the achievement of SDG 4—ensuring inclusive and equitable quality education for all. In conclusion, AI offers significant potential to transform Nigeria’s education system by bridging access gaps and enabling inclusive learning. Realizing this potential requires coordinated investments in infrastructure, teacher training, localized content development, and policy alignment. By adopting this framework, Nigeria can take critical steps toward an education system that is adaptive, inclusive, and future-ready.

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