
| RESEARCH ARTICLE

An Essencist Assessment of the Impacts of Artificial Intelligence on Educational Development in Nigeria

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| ABSTRACT

Artificial Intelligence (AI) is transforming education worldwide, offering new opportunities for personalized learning, efficiency in administration, and enhanced teaching methodologies. However, in Nigeria, the integration of AI into the educational sector raises philosophical, infrastructural, ethical, and socio-cultural questions. This paper examines AI's impact on educational development in Nigeria through the lens of Essencism, a philosophical perspective that emphasizes the intrinsic nature of learning as an intellectual and moral process. The research adopted the qualitative method and collected data from existing literature such as textbooks, journals and other relevant materials. The study explores AI's potential to enhance accessibility, bridge learning gaps, and support personalized education while critically assessing its limitations, including algorithmic bias, teacher displacement concerns, and infrastructural challenges. Furthermore, the paper addresses the governance of AI in Nigeria's educational sector, analyzing the absence of clear policies, the implications of data privacy regulations, and the role of international organizations such as UNESCO in shaping AI adoption. It also discusses ethical considerations, particularly how AI affects traditional learning methods, cultural values, and the role of teachers in an AI-driven educational environment. The socio-cultural impacts of AI on Nigeria's education system are explored, highlighting concerns about the depersonalization of learning and the risk of eroding Indigenous knowledge. Through an Essencist assessment, this paper argues that while AI presents opportunities for educational advancement, its integration must align with the essence of learning—critical thinking, ethical reasoning, and intellectual development. The study concludes that strategic policies, sustainable AI investments, and culturally sensitive approaches are essential for maximizing AI's benefits while preserving the core values of education in Nigeria.

| KEYWORDS

Artificial Intelligence, Essencism, Education, Assessment, Development

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1. Introduction

Education is a fundamental pillar of societal progress, shaping intellectual development, ethical reasoning, and socio-economic mobility. Over the past decade, Artificial Intelligence (AI) has emerged as a transformative force in global education, influencing pedagogy, assessment, and administration. Jacinta Oseghale (2024) observes that 3 dynamic trends are shaping the future of education in Nigeria: online learning, artificial intelligence, and virtual reality in classrooms. She argues that the future of education in Nigeria is brimming with promise in the convergence of online education.

Al-Oyanabo (2024) states that "AI has significant potential to revolutionize Nigeria's education system by personalizing learning experiences, improving student engagement, and streamlining administrative processes. However, several challenges hinder its widespread adoption. These include inadequate infrastructure, limited funding, poor internet connectivity, and resistance to technological change among educators and policymakers."

AI-powered learning platforms, adaptive tutoring systems, and automated grading tools have been widely adopted in various regions. However, in developing nations like Nigeria, AI's integration into education presents unique challenges and opportunities, necessitating a context-specific analysis.

Nigeria, the most populous country in Africa, faces persistent educational challenges, including insufficient infrastructure, teacher shortages, high student-to-teacher ratios, and disparities between urban and rural education systems. According to Ogunode and Hayab (2021), the Nigerian educational system is plagued with many problems. The problems include inadequate funding, inadequate professional teachers, inadequate infrastructural facilities, poor supervision, corruption, weak administrators, poor quality education, overcrowding, brain-drain and insecurity problems.

The introduction of AI is often seen as a potential solution to these challenges, offering personalized learning experiences, real-time feedback mechanisms, and scalable education models. Nonetheless, the deployment of AI in Nigerian education must be critically examined to ensure that it aligns with the fundamental essence of learning and does not compromise the depth of intellectual engagement, ethical reasoning, and human interaction that define education. There are many problems that arise from the integration of AI into education, such as accessibility and equity in its use, data privacy and security, ethical use of AI, and training and capacity building. (Oyebanji 2024) these issues have to be tackled to enable its effective use.

This study applies an Essencist framework to evaluate AI's impact on Nigeria's educational system. Essencism is a philosophical perspective that argues that every phenomenon has an intrinsic nature or "essence" that defines its true purpose. In education, this essence is not merely information transfer but the holistic development of intellectual, moral, and creative capacities. AI's role in education should, therefore, be assessed not just on its efficiency but on its ability to preserve and enhance the deeper essence of learning.

While AI has the potential to bridge educational gaps, improve accessibility, and enhance pedagogical approaches, its integration in Nigeria remains largely unregulated, inconsistent, and dependent on private-sector initiatives. There are several key challenges that include:

Lack of Policy Framework: Nigeria does not have a structured AI education policy, leaving its adoption uncoordinated and susceptible to ethical risks.

Infrastructure and Accessibility Issues: Limited digital infrastructure, unreliable electricity, and high internet costs restrict AI-driven education, particularly in rural areas.

Ethical and Socio-Cultural Concerns: The increasing reliance on AI may alter the traditional teacher-student relationship, depersonalize learning, and introduce algorithmic biases that disadvantage certain groups.

Teacher-Student Dynamics: AI cannot replace the mentorship, emotional intelligence, and ethical guidance provided by human educators.

Data Privacy and Security Risks: AI-powered education platforms collect vast amounts of student data, raising concerns about privacy and potential misuse.

These issues necessitate a careful assessment of AI's role in education from an Essencist perspective, ensuring that technological advancements align with the fundamental principles of learning rather than merely serving as tools of efficiency.

2. The Philosophy of Essencism

Essencism is a philosophical framework that emphasizes the inherent essence of things, suggesting that everything possesses an intrinsic nature that defines its purpose and function. In educational discourse, Essencism posits that

learning is not merely a process of acquiring information but an engagement with the fundamental nature of knowledge and understanding. This approach contrasts with technological determinism, which argues that tools like AI shape and redefine educational experiences.

Essencism holds that education's primary essence is intellectual cultivation—developing the cognitive, moral, and creative capacities of learners. From this perspective, AI's role in education must be assessed based on whether it preserves, enhances, or diminishes this fundamental essence. AI-driven learning tools can offer efficiency and accessibility, but their ability to preserve the depth of human intellectual, moral, and conscious engagements remains questionable.

Furthermore, the philosophy of Essencism considers the human element in education indispensable. Teachers do not merely transfer knowledge; they inspire critical thinking, moral reasoning, and creativity. If AI alters the fundamental teacher-student dynamic, does it disrupt the essence of education? This question is crucial when assessing AI's integration into Nigerian education.

3. Essencism in the Nigerian Context

In Nigeria, where traditional knowledge systems coexist with modern education, Essencism provides a useful lens for evaluating AI's role. Education in Nigeria has historically been linked to communal learning, oral traditions, and interpersonal mentorship. If AI-driven models shift education toward automation and digital interaction, they might challenge these traditional learning paradigms. However, if AI is used to enhance and preserve indigenous learning methods—such as language translation for local dialects—it can align with educational essences rather than disrupt them.

4. AI and the Nature of Knowledge

The introduction of AI into education raises profound philosophical questions about the nature of knowledge itself. AI systems are designed to process, analyze, and generate information, but does this equate to knowledge? Traditional epistemology distinguishes between data, information, and knowledge:

- Data refers to raw, unprocessed facts.
- Information is organized data that has meaning.
- Knowledge involves critical engagement, interpretation, and contextual application.

AI, through machine learning and neural networks, can store and retrieve vast amounts of information, but it lacks the ability to internalize or truly understand knowledge in the human sense. AI does not possess consciousness, intuition, or the ability to reflect on ethical or philosophical dimensions of learning.

5. Can AI Facilitate Deep Learning?

In Nigerian education, where rote memorization is often criticized as a dominant learning method, AI could enhance deep learning by providing personalized feedback, fostering inquiry-based learning, and offering adaptive learning experiences. However, AI's limitations in fostering abstract reasoning, ethical judgment, and emotional intelligence highlight the need for human educators in the learning process.

5.1 Implications for Nigerian Educational Policy

The deployment of AI in Nigeria's educational sector must consider these epistemological distinctions. If AI is used merely as a content delivery mechanism, it risks reducing education to information retrieval rather than knowledge acquisition. Policymakers and educators must ensure that AI applications align with pedagogical frameworks that support critical thinking and intellectual engagement.

6. AI in the Nigerian Educational System: Current State and Developments

AI is gradually making inroads into Nigeria's education system, primarily through digital learning platforms, AI-powered tutoring, and automated assessment tools. However, its adoption is uneven, with urban institutions benefiting more than rural schools (Luckin 2018).

6.1 AI-Driven Learning Systems in Nigeria

Several AI-driven learning initiatives have been introduced in Nigeria, albeit with varying degrees of success. Key areas of AI application include:

- Smart Classrooms and Adaptive Learning Systems
- AI-powered platforms such as Edmodo and Google Classroom have been integrated into some private schools in Nigeria to facilitate interactive learning.
- Adaptive learning software adjusts instructional content based on a student's progress, ensuring personalized learning.

AI Tutors and Chatbots

Platforms like uLesson, a Nigerian EdTech startup, leverage AI to provide personalized tutoring in core subjects.

AI-powered chatbots assist students with answering questions and providing explanations, particularly in subjects like mathematics and science.

Automated Grading and Assessment

AI is being used to automate grading systems, especially for multiple-choice assessments, reducing the workload on teachers. Some institutions are experimenting with AI-assisted essay grading, though concerns remain regarding its ability to evaluate critical thinking and argumentation.

6.2 Barriers to AI Integration in Nigerian Education

Despite its potential, several challenges hinder the effective integration of AI into Nigeria's educational sector, and these include the following:

Limited Digital Infrastructure: Internet penetration remains low in many rural areas, limiting access to AI-driven educational tools and power shortages disrupt online and AI-based learning systems, particularly in underserved regions.

Financial Constraints and Government Investment: AI-driven education requires significant investment in hardware, software, and teacher training. Additionally, public schools, which educate the majority of Nigerian students, often lack the funding to implement AI technology.

Resistance to Technological Change: Many educators and stakeholders remain skeptical about AI's role in education, fearing job displacement. Also, cultural attitudes toward AI as a "Western" technology may also slow adoption in some regions.

6.3 Pedagogical Implications of AI in Nigerian Education

The integration of AI into education has significant implications for pedagogical practices in Nigeria. AI can revolutionize teaching methods, student engagement, and learning assessment, but it also raises concerns about the role of teachers and the quality of AI-driven instruction. AI can be seen as a pedagogical tool under the following:

Enhancing Personalized Learning Experiences: AI can analyze student performance data to tailor learning experiences, addressing individual strengths and weaknesses.

This is particularly beneficial in large classrooms where individualized attention is often lacking.

AI-Powered Assessment and Grading: Automated assessment tools can provide instant feedback to students, helping them track their progress more effectively. However, AI struggles with assessing qualitative aspects of learning, such as creativity and critical thinking.

Bridging Learning Gaps: AI can provide supplementary education to students in under-resourced schools. It can also assist students with disabilities by offering adaptive learning materials tailored to their needs.

6.4 The Role of Teachers in an AI-Driven Educational System

AI's increasing role in education raises questions about the future of teaching professions in Nigeria. Rather than replacing teachers, AI should be seen as an assistive tool that enhances the teaching experience. This can be addressed under the following:

- **Augmentation vs. Replacement**

AI should not replace human teachers but rather serve as a co-pilot in education.

Teachers bring emotional intelligence, mentorship, and ethical guidance that AI cannot replicate.

- **Teacher Training and AI Literacy**

Nigerian educators need specialized training in AI tools to maximize their effectiveness in the classroom.

Professional development programs should be implemented to ensure teachers are not left behind in the AI transition.

- **Ethical and Professional Considerations**

AI-driven education should be implemented in ways that respect teachers' autonomy and professional expertise.

Policies must ensure that AI does not undermine teachers' roles but instead empowers them to provide better education (Ogunniyi and Ojo, 2022).

6.5 AI and Educational Accessibility in Nigeria

One of the most significant promises of AI in education is its potential to enhance accessibility, particularly in regions with inadequate educational infrastructure. Nigeria, with its vast population and socio-economic disparities, struggles with ensuring equal access to quality education. AI can help bridge this gap by providing personalized, scalable, and adaptable learning solutions (Osunade and Awolowo 2021)

AI can promote inclusive education because of AI-powered language translation for local Nigerian dialects. Nigeria is home to over 500 languages, creating a linguistic challenge in education. AI-driven translation tools, such as Google Translate and AI-powered speech recognition software, can help break language barriers.

AI-assisted education can translate complex subjects into Indigenous languages like Yoruba, Igbo, Efik, Ijaw, Ibibio, and Hausa, improving comprehension. AI chatbots can be programmed to provide answers in multiple languages, fostering inclusivity. AI can encourage special education and disability inclusion as a result of AI-powered assistive technologies that can enhance learning opportunities for students with disabilities. Text-to-speech and speech-to-text tools can aid visually and hearing-impaired students. AI-driven captioning can also improve accessibility for deaf students. Adaptive learning software can adjust pacing and teaching strategies for neurodivergent learners, such as those with autism or dyslexia.

AI can promote distance learning in rural areas since rural communities often lack access to trained teachers and modern classrooms. AI-powered remote learning platforms offer a solution:

AI-driven chatbots can tutor students in isolated regions. Machine learning algorithms can recommend personalized study materials. Mobile-based AI learning apps (e.g., uLesson) allow students to learn with minimal infrastructure.

Challenges in AI-driven accessibility are a problem in Nigeria because, despite its potential, AI integration in Nigerian education faces several obstacles due to Internet and electricity limitations. Nigeria has an inconsistent power supply, particularly in rural areas, limiting AI-powered education access. Internet penetration remains below the global average, and data costs are high, restricting online learning.

Socio-economic disparities in AI adoption are equally a problem in Nigeria because AI-driven education may widen the digital divide, benefiting only urban students while excluding rural and low-income learners. Only private institutions currently have access to advanced AI tools, leaving public schools at a disadvantage.

There is also the issue of cultural and religious resistance since some communities may resist AI-based learning due to traditional views on education. Religious perspectives on AI as an “inhuman” force may impact adoption rates.

6.6 Policy and Governance Challenges in AI Integration

Nigeria's education system lacks a structured AI policy, creating governance challenges. While AI-driven education is expanding, there is little legal framework to regulate it effectively. AI regulation in Nigerian education is not effective because government policies on AI integration are not fully established. The Federal Ministry of Education has yet to establish clear AI education policies. The National Information Technology Development Agency (NITDA) has introduced AI-related policies, but they do not specifically address education. The lack of centralized AI curriculum integration hinders nationwide implementation (NITDA 2021). Data protection laws and student privacy are not in place in the country. AI-driven educational tools collect vast amounts of student data, raising privacy concerns. The Nigerian Data Protection Regulation (NDPR) offers minimal protections for students' educational data. AI-powered surveillance in classrooms raises ethical questions about student monitoring.

6.7 Ethical Considerations in AI-Driven Education

AI's role in education raises critical ethical concerns. While AI can enhance learning experiences, it also introduces risks related to bias, employment displacement, and the depersonalization of education. AI could create bias and discrimination because of algorithmic bias in educational AI tools. AI systems may reinforce existing biases if trained on limited or skewed data. AI-based grading systems may unfairly disadvantage certain demographics. AI-powered admissions tools may favor students from wealthier backgrounds due to data bias.

There could also be socio-economic and gender disparities since female students may be less likely to access AI-based education due to digital gender gaps. Rural students may be underrepresented in AI-driven learning datasets, affecting AI recommendations. Ethical implications of AI replacing human educators, which could affect teacher employment. AI automation may reduce the demand for human teachers, particularly in administrative roles. However, AI cannot replace human mentorship, emotional intelligence, or ethical reasoning (Boddington 2020).

There is the issue of moral limits of AI in education because AI lacks moral and ethical reasoning capabilities. Ethical guidelines must be developed to ensure AI complements human education rather than replacing it.

6.8 Socio-Cultural Impacts of AI on Nigerian Educational Practices

AI integration will not only transform how students learn but also affect Nigeria's cultural and traditional educational values. This will present a problem between traditional learning methods and AI-driven learning. There must be a role for oral traditions and AI adaptability in the country since Nigerian education has historically relied on oral traditions, proverbs, and storytelling. AI-driven learning must incorporate local knowledge systems rather than replace them. Efforts must be made to curb cultural resistance to AI in education. This is due to the fact that some communities view AI as a foreign intrusion into traditional learning systems. Religious scholars may oppose AI-generated educational materials, fearing cultural erosion. However, AI must be able to assist in the preservation of language. Also, AI has the potential to digitalize Indigenous languages, which can be seen in AI-driven voice recognition, which can preserve and promote endangered Nigerian languages. AI chatbots can be trained to teach indigenous languages, strengthening cultural identity. There is a risk of cultural erosion through AI reliance, but over-reliance on AI in education could diminish students' appreciation for traditional knowledge. AI-powered learning must balance global knowledge with Nigerian cultural heritage.

6.9 Philosophical Reflections: AI and the Essence of Education

The Essencist perspective adopted in this study posits that education is not merely a transfer of information but a holistic process that fosters intellectual, moral, and emotional development. AI, while valuable as a technological enhancer, cannot substitute the deeper aspects of learning that require human intuition, ethical judgment, and personal mentorship.

AI's role in Nigerian education must, therefore, be redefined as a supplementary tool rather than a central authority in learning. While AI can automate routine tasks and provide personalized instruction, it cannot replace the critical

role of teachers in shaping ethical and socially responsible individuals. A balanced approach—where AI enhances but does not dictate learning—is necessary to maintain the integrity and essence of education.

7. The Future of AI in Nigerian Education

The integration of AI into Nigeria's education system represents a pivotal moment in the nation's academic evolution. If harnessed strategically, AI can revolutionize learning, expand educational access, and empower students with personalized learning experiences. However, without careful regulation, ethical oversight, and socio-cultural sensitivity, AI may exacerbate inequalities, erode educational integrity, and undermine traditional learning values.

Ultimately, AI should serve as a tool that enhances—rather than replaces—the human essence of education. Its implementation must be guided by policies that prioritize educational equity, ethical responsibility, and cultural preservation. By adopting a balanced and contextually relevant approach, Nigeria can leverage AI's potential while safeguarding the fundamental essence of learning—critical thinking, ethical growth, and intellectual curiosity.

As Nigeria navigates the future of AI-driven education, the core question remains: Can AI be integrated in a way that enhances learning without compromising the fundamental essence of education? The answer lies in a strategic, ethical, and culturally responsive approach that ensures AI serves as an enabler of intellectual and moral development rather than a mere technological disruptor.

AI presents both opportunities and challenges for Nigerian education. To ensure a balanced approach, policies must align AI with educational essence, preserving intellectual depth while leveraging technological advancements. Strategic government investment, ethical oversight, and cultural sensitivity will be key to AI's successful integration into Nigeria's educational landscape.

Artificial Intelligence (AI) is poised to play a transformative role in Nigeria's education sector, offering a range of benefits such as personalized learning, improved accessibility, enhanced administrative efficiency, and support for digital classrooms. However, its integration into Nigeria's educational system presents a complex array of challenges that must be critically addressed. This study, grounded in Essencist philosophy, has assessed AI's role in Nigerian education through a holistic lens—examining its pedagogical, ethical, policy, socio-cultural, and governance implications.

- **AI Enhances Learning but Challenges the Essence of Education**

AI's ability to personalize education, automate assessments, and expand access to quality learning materials has the potential to bridge learning gaps, particularly in underserved rural areas. However, AI-driven learning prioritizes efficiency over deep intellectual engagement, moral reasoning, and the human mentorship that defines education's essence. AI should complement, rather than replace, the teacher-student relationship that fosters critical thinking, ethical reasoning, and creativity (Selwyn 2019)

- **AI Improves Educational Accessibility but Worsens the Digital Divide**

AI has introduced remote learning tools, language translation models, and assistive technologies for students with disabilities, making education more inclusive. However, Nigeria's uneven access to electricity, internet connectivity, and digital literacy training exacerbates existing inequalities. Without strategic intervention, AI-driven education may disproportionately benefit students in urban areas while excluding rural and low-income learners, widening the digital divide rather than closing it.

- **AI Raises Ethical Concerns Related to Bias, Data Privacy, and Teacher Displacement**

AI-driven grading systems, admission tools, and learning recommendations may reinforce algorithmic biases, disadvantaging certain demographics. Additionally, AI-powered platforms collect vast amounts of student data, raising concerns about privacy violations and cybersecurity risks. Furthermore, AI threatens teacher employment and pedagogical autonomy as automation increasingly takes over administrative and instructional roles.

- **AI Lacks a Clear Regulatory and Policy Framework in Nigeria**

While many developed nations have established AI education policies, Nigeria lacks a structured regulatory framework to guide AI's ethical and sustainable integration. The absence of comprehensive AI laws raises concerns about unregulated data collection, biased learning algorithms, and the unchecked influence of private technology firms in education. Effective policies must be rooted in Nigeria's unique educational, socio-cultural, and economic realities to ensure AI benefits all learners equitably.

- **AI's Socio-Cultural Impact Risks Undermining Traditional Learning Systems**

Nigeria's educational heritage is deeply rooted in oral traditions, communal learning, and cultural storytelling, which may be diluted by an AI-driven system that prioritizes digital automation over traditional mentorship. If improperly implemented, AI in education could erode indigenous knowledge systems, weaken teacher authority, and promote Western-centric learning models that marginalize local cultures. AI should, therefore, be aligned with Nigeria's educational values, ensuring it preserves cultural identity rather than undermining it.

7.1 Recommendations for Sustainable AI Integration in Nigerian Education

Given the findings and philosophical reflections, this study proposes several recommendations for policymakers, educators, and technology developers to ensure that AI's integration into Nigerian education aligns with the intrinsic values of learning:

- **Establish a National AI Education Policy Framework**

The Nigerian government must develop clear policies and guidelines regulating AI's use in education.

Policies should address algorithmic bias, teacher job security, and student data privacy.

AI education initiatives must be inclusive, ensuring accessibility for marginalized communities.

- **Bridge the Digital Divide and Improve Infrastructure**

The government and private sectors should invest in internet access, affordable digital tools, and reliable electricity for rural schools.

AI-powered learning platforms should be designed with offline capabilities to accommodate students with limited connectivity.

- **Promote Ethical AI Use and Teacher Involvement**

AI tools should be developed with teacher input, ensuring they enhance—rather than replace—traditional teaching methods.

Training programs must be established to equip educators with AI literacy skills, enabling them to integrate AI ethically and effectively (Chukwuma, 2023).

AI developers must be held accountable for transparent and unbiased algorithms to prevent discrimination.

- **Preserve Cultural Identity in AI-Driven Education**

AI-driven education models should incorporate indigenous knowledge, local languages, and traditional teaching methods.

The curriculum should balance technological advancements with Nigeria's rich cultural and intellectual heritage.

AI must be contextualized to fit Nigeria's educational values rather than enforcing Western-centric pedagogies.

- **Strengthen Data Privacy Laws to Protect Students**

Nigeria must implement stricter data protection laws governing AI-powered educational platforms.

AI developers should adopt ethical data collection practices, prioritizing student privacy and security.

Policies should ensure student data is not exploited for commercial or political purposes.

8. Conclusion

The adoption and use of AI have spread into almost all aspects of our modern world, and the Nigerian education system must not be left behind in reaping the benefits of this technological advancement. AI presents both opportunities and challenges for Nigerian education, and there is a need to tackle these challenges to ensure the effective integration of AI into education. To ensure a balanced approach, policies must align AI with educational essence, preserving intellectual depth while leveraging technological advancements. Strategic government investment, ethical oversight, and cultural sensitivity will be key to AI's successful integration into Nigeria's educational landscape. This research was limited by the availability of materials on the national AI policy for Nigeria, and there is a need for this AI policy to guide how AI is integrated into education in Nigeria. This will ensure that AI is adopted in a manner that will impact our society positively. This research has recommended ways through which AI can be successfully integrated into education in Nigeria, and if these steps are considered, they will aid the smooth integration of AI, which will positively impact education in Nigeria. Future researchers can direct their work toward the formulation of a policy framework for incorporating AI in education in Nigeria, taking into consideration the peculiarities of Nigeria's cultural, social, and technological terrain.

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