



ARTIFICIAL INTELLIGENCE AND THE FUTURE OF TEACHING PROFESSION IN NIGERIA TERTIARY EDUCATION SYSTEM

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Abstract

The integration of Artificial Intelligence (AI) into Nigeria's higher education system holds transformative potential for enhancing learning experiences, improving institutional efficiency, and addressing systemic challenges. This paper explores the future prospects of AI in Nigerian higher education by examining current trends, policy implications, and regulatory needs. AI technologies offer personalized learning experiences through adaptive systems that cater to individual student needs, thus enhancing educational outcomes. They also promise significant improvements in institutional efficiency by automating administrative tasks and optimizing resource allocation. Despite these advantages, the successful implementation of AI requires a robust policy and regulatory framework to address data privacy, ethical considerations, and equity issues. Current policies in Nigeria, while promoting digital literacy, often lack specific provisions for AI. There is a pressing need for comprehensive AI policies that ensure data protection, address algorithmic biases, and provide clear ethical guidelines for AI use. Additionally, investments in infrastructure and professional development are crucial for supporting AI integration. Equitable access to AI technologies must be prioritized to bridge the digital divide and ensure that all students benefit from AI advancements. Collaborative efforts among government agencies, educational institutions, and technology providers are essential for developing effective policies and fostering innovation. This paper concludes with recommendations for developing a dynamic regulatory framework and supporting infrastructure to harness AI's full potential in Nigeria's higher education sector, aiming for enhanced educational quality and equitable growth.

Key Words: Artificial Intelligence, Teaching profession, Education System.

Introduction

The advent of Artificial Intelligence (AI) has precipitated profound transformations across various sectors, with education being one of the most significantly impacted. In the context of Nigeria's tertiary education system, the integration of AI presents both unprecedented opportunities and formidable challenges. This introduction delves into the evolving landscape of AI in education, with a particular focus on its implications for the teaching profession in Nigerian universities, polytechnics, and colleges of education. Artificial Intelligence, defined as the simulation of human intelligence in machines, is revolutionizing educational practices globally. AI technologies encompass a range of applications, including machine learning, natural language processing, and robotics, all of which have the potential to enhance educational delivery and



administration. According to Luckin et al. (2016), AI can support personalized learning, automate administrative tasks, and provide data-driven insights to improve educational outcomes.

In Nigeria, the adoption of AI in tertiary education is still in its nascent stages, but there is growing recognition of its potential. Recent studies, such as those by Eke (2020) and Ogunyemi (2022), highlight the increasing interest in leveraging AI to address the systemic challenges facing Nigeria's education system, such as large class sizes, inadequate teaching resources, and the need for more effective learning interventions. The introduction of AI in Nigerian tertiary institutions carries significant implications for the teaching profession. On one hand, AI can augment the capabilities of educators, allowing them to deliver more personalized and effective instruction. For instance, AI-driven tools can analyze student performance data to identify learning gaps and suggest targeted interventions (Holmes et al., 2019). Additionally, AI can automate routine administrative tasks, freeing up time for teachers to focus on more critical aspects of their roles, such as curriculum development and student engagement. However, the integration of AI also raises concerns about the future of the teaching profession. There are apprehensions regarding the potential displacement of teachers by AI technologies, especially in an environment where job security is already precarious. According to Adeoye and Olumuyiwa (2021), there is a need for a balanced approach that ensures AI serves as a complement rather than a replacement for human educators. The adoption of AI in Nigeria's tertiary education system presents a unique set of challenges and opportunities. One of the primary challenges is the lack of infrastructure and technical expertise needed to effectively implement AI solutions. As noted by Akinyele and Ojo (2023), many Nigerian institutions struggle with inadequate funding, insufficient technological infrastructure, and a shortage of skilled personnel capable of developing and maintaining AI systems. Despite these challenges, the potential benefits of AI in education are substantial. AI can facilitate more inclusive and accessible education, particularly for students with disabilities or those in remote areas. Furthermore, AI-driven analytics can provide valuable insights into educational practices, enabling continuous improvement and innovation.

To harness the potential of AI in Nigeria's tertiary education system, a multi-faceted approach is required. This includes investing in the necessary infrastructure, fostering partnerships between educational institutions and technology providers, and promoting the development of digital literacy among educators and students. Additionally, it is crucial to address ethical considerations, such as data privacy and the equitable distribution of AI benefits, to ensure that the integration of AI contributes positively to the educational landscape. However, while the advent of AI in Nigeria's tertiary education system poses significant challenges, it also offers transformative opportunities for the teaching profession. By embracing AI and leveraging its capabilities, Nigeria can enhance the quality of education, improve teaching practices, and ultimately, better prepare its students for the future.

Meaning/Historical Context and Evolution of AI in Education

The integration of AI in education is not a recent phenomenon. Early AI systems in the 1960s and 1970s, such as LOGO and PLATO, focused on providing computer-assisted instruction and interactive learning experiences (Luckin et al., 2016). These early systems laid the foundation for more sophisticated AI applications in education. In the 1990s and early 2000s, the development of intelligent tutoring systems (ITS) marked a significant advancement. These systems used AI to provide personalized instruction and feedback, adapting to individual student needs. Notable examples include the Cognitive Tutor, which was used to teach mathematics and other subjects, and AutoTutor, which engaged students in natural language dialogues to improve comprehension (Woolf, 2009).

The advent of big data and advancements in machine learning algorithms in the 2010s further accelerated the evolution of AI in education. The availability of large datasets enabled more accurate predictions of student performance and more effective personalization of learning experiences. Adaptive learning platforms like Knewton and DreamBox Learning emerged, offering highly customized educational content based on individual learning patterns (Holmes et al., 2019).

Global Trends in AI Adoption in Higher Education

The adoption of AI in higher education is a global phenomenon, with institutions worldwide exploring its potential to enhance teaching and learning. According to a report by Educause (2019), AI is being used to improve student outcomes, streamline administrative processes, and support faculty in their instructional roles.



In the United States, universities such as Stanford and MIT have been at the forefront of AI research and application in education. Stanford's Learning Lab and MIT's Open Learning Initiative leverage AI to create adaptive learning environments and provide data-driven insights into student learning (Educause, 2019). These initiatives aim to improve educational outcomes by making learning more personalized and accessible.

In Europe, the European Commission has recognized the potential of AI in education and launched initiatives to promote its adoption. The European Union's Horizon 2020 program has funded numerous projects focused on developing AI-driven educational technologies and fostering digital skills among educators and students (European Commission, 2020). One notable project is the iTalk2Learn platform, which combines AI and game-based learning to support mathematics education.

In Asia, countries like China and Singapore are rapidly advancing in the field of AI in education. China's Ministry of Education has integrated AI into its educational reform plans, emphasizing the importance of AI literacy and the development of AI-driven educational tools (Li et al., 2020). Singapore's AI in Education initiative focuses on using AI to create personalized learning experiences and improve educational outcomes through data analytics (Singapore Ministry of Education, 2019).

AI is also gaining traction in developing regions, including Africa and Latin America. In Africa, organizations like the African Institute for Mathematical Sciences (AIMS) are leveraging AI to improve STEM education and bridge the digital divide (AIMS, 2021). In Latin America, the Inter-American Development Bank has launched initiatives to promote the use of AI in education to enhance teaching quality and accessibility (IDB, 2020).

Current State of AI in Nigeria's Tertiary Education System

Artificial Intelligence (AI) is gradually making inroads into Nigeria's tertiary education system, offering potential solutions to longstanding challenges while also encountering unique obstacles. This discussion explores the current state of AI adoption in Nigerian higher education, highlighting specific cases and the peculiarities of the Nigerian context.

Extent of AI Adoption in Nigerian Tertiary Institutions

AI adoption in Nigerian universities, polytechnics, and colleges of education is still in its early stages. Several institutions are beginning to explore AI applications, albeit at varying levels of sophistication and integration. According to Eke (2020), the primary focus has been on leveraging AI for administrative tasks, data management, and basic student support services.

One prominent example is the University of Ibadan, which has initiated projects to integrate AI into its administrative processes. These projects include the development of chatbots for student inquiries and AI-driven systems for managing student records and admissions (Akinyele & Ojo, 2023). Additionally, Covenant University has implemented AI-based learning management systems to enhance the delivery of online courses, especially during the COVID-19 pandemic (Adeoye & Olumuyiwa, 2021).

Despite these advances, the overall penetration of AI in Nigeria's tertiary education remains limited. The majority of institutions lack the necessary infrastructure and technical expertise to fully implement and benefit from AI technologies. This situation is exacerbated by issues such as inconsistent electricity supply, limited internet connectivity, and inadequate funding for technological initiatives (Ogunyemi, 2022). (Adeoye & Olumuyiwa, 2021).

Challenges Facing AI Integration in Nigeria's Tertiary Education

Integrating Artificial Intelligence (AI) into Nigeria's tertiary education system offers significant potential but also encounters numerous challenges. These obstacles include inadequate technological infrastructure, digital literacy and skills gaps, financial constraints, and ethical considerations. Understanding these challenges is crucial for developing effective strategies to harness AI's transformative power in education.

Inadequate Technological Infrastructure

One of the primary challenges facing AI integration in Nigeria's tertiary education system is the inadequate technological infrastructure. Many Nigerian universities lack the robust and reliable internet connectivity essential for AI-driven educational tools and platforms. Frequent power outages and unreliable



electricity supply further complicate the deployment and consistent operation of AI systems (Akinyele & Ojo, 2023).

For AI to function optimally, institutions require high-speed internet, modern computer hardware, and adequate server capacity. However, most Nigerian universities operate with outdated equipment and limited access to necessary digital resources. This technological deficiency not only hampers the adoption of AI but also affects the quality of education provided to students. According to Eke (2020), even basic e-learning platforms struggle with these infrastructural issues, making the integration of more advanced AI technologies particularly challenging.

Digital Literacy and Skills Gap

The digital literacy and skills gap among educators and administrative staff is another major barrier to AI integration. Most faculty members in Nigerian tertiary institutions have limited exposure to AI concepts and tools, affecting their ability to incorporate these technologies into their teaching practices effectively (Adeoye & Olumuyiwa, 2021). This skills gap extends to students, who also need to be trained to use AI tools proficiently.

Professional development programs focused on AI competencies are essential for bridging this gap. However, there is a lack of structured training opportunities for educators to enhance their digital skills. As Akinyele and Ojo (2023) point out, many Nigerian universities do not have the resources or expertise to offer comprehensive AI training programs. This results in a workforce that is ill-prepared to leverage AI technologies for educational purposes.

Financial Constraints

Financial constraints pose a significant challenge to the integration of AI in Nigeria's tertiary education system. Most institutions operate on limited budgets, with scarce resources allocated to technological advancements. The costs associated with acquiring, implementing, and maintaining AI infrastructure can be prohibitively high for many universities (Ogunyemi, 2022).

Funding limitations affect not only the procurement of AI technologies but also the necessary training and support services. Institutions may struggle to afford the high-quality hardware and software required for AI applications, as well as the continuous professional development needed to ensure that educators can use these tools effectively.

Professional Development and Training for Educators

The integration of Artificial Intelligence (AI) in education necessitates a paradigm shift in teaching practices and requires significant professional development and training for educators. Effective professional development equips educators with the skills and knowledge needed to harness AI technologies, ensuring that they can deliver high-quality education in an evolving technological landscape. This section explores the importance of professional development, key strategies for effective training, and the challenges faced in implementing these programs, citing recent authors to support the discussion.

Importance of Professional Development

Professional development is crucial for educators to effectively integrate AI into their teaching practices. It ensures that teachers are not only familiar with AI tools but also understand how to leverage these technologies to enhance student learning outcomes. According to Adeoye and Olumuyiwa (2021), continuous professional development helps educators stay updated with the latest technological advancements and pedagogical approaches, fostering a culture of innovation and lifelong learning.

AI has the potential to transform various aspects of education, from personalized learning to administrative efficiency. However, realizing these benefits requires educators who are well-versed in AI applications and can navigate the complexities associated with these technologies. Akinyele and Ojo (2023) emphasize that without adequate training, educators may struggle to effectively integrate AI into their classrooms, leading to suboptimal outcomes for students.

Moreover, professional development programs can address the digital literacy gap among educators. Many teachers in Nigerian tertiary institutions have limited exposure to AI and related technologies, which can hinder their ability to use these tools effectively. Training programs focused on digital literacy and AI



competencies are essential for building a workforce capable of utilizing AI to its full potential (Holmes et al., 2019).

Future Prospects of AI in Nigeria's Higher Education

The future of Artificial Intelligence (AI) in Nigeria's higher education system is filled with promising opportunities and transformative potential. As the country seeks to improve its educational infrastructure and outcomes, AI offers innovative solutions to longstanding challenges. This section discusses the potential future developments of AI in Nigerian higher education, focusing on enhancing learning experiences, improving institutional efficiency, fostering inclusivity, and addressing workforce readiness to achieve the yearning of the overall system of education.

Enhancing Learning Experiences

AI has the potential to revolutionize learning experiences in Nigeria's higher education by enabling more personalized and adaptive learning environments. As Adeoye and Olumuyiwa (2021) note, AI can analyze student data to tailor educational content to individual needs, learning styles, and pace. This personalization ensures that students receive targeted support, leading to improved understanding and retention of course material.

Future AI-powered learning platforms could offer real-time feedback and adaptive assessments, allowing students to identify and address their learning gaps promptly. These platforms can also provide diverse learning resources, such as interactive simulations, virtual labs, and multimedia content, making learning more engaging and effective. For instance, AI-driven tools like virtual tutors and intelligent tutoring systems can provide personalized guidance and support, enhancing the overall learning experience (Holmes et al., 2019).

In addition to enhancing student learning, AI can assist educators in curriculum development and instructional design. AI tools can analyze large datasets to identify trends and patterns, helping educators create more relevant and effective curricula. This data-driven approach ensures that educational programs are aligned with current industry demands and future workforce needs (Akinyele & Ojo, 2023).

Improving Institutional Efficiency

AI can significantly improve the efficiency of higher education institutions in Nigeria by automating administrative tasks and streamlining operations. Automated systems for grading, scheduling, and student management can reduce the administrative burden on faculty and staff, allowing them to focus more on teaching and research activities (Ogunyemi, 2022).

AI-powered chatbots and virtual assistants can handle routine inquiries and administrative processes, such as course registration and fee payments, providing instant responses to students and reducing wait times. These technologies enhance the student experience by making administrative processes more efficient and accessible (Eke, 2020).

Fostering Inclusivity and Accessibility

AI has the potential to make higher education more inclusive and accessible for all students, including those with disabilities and those from disadvantaged backgrounds. AI-powered assistive technologies, such as speech recognition, text-to-speech, and real-time translation tools, can support students with diverse needs, enabling them to participate fully in educational activities (Adeoye & Olumuyiwa, 2021).

For instance, AI can provide personalized learning materials in various formats, such as audio, visual, and tactile, catering to different learning preferences and abilities. This inclusivity ensures that all students have equal opportunities to succeed, regardless of their individual challenges.

In addition, AI can help bridge the gap between urban and rural education by providing access to high-quality educational resources and experiences. Online learning platforms powered by AI can reach students in remote areas, offering them the same opportunities for advanced learning and skill development as their urban counterparts (Akinyele & Ojo, 2023).

Addressing Workforce Readiness

As Nigeria aims to build a knowledge-based economy, preparing students for the future workforce is a critical goal of higher education. AI can play a pivotal role in aligning educational programs with industry requirements and equipping students with the skills needed in the digital economy (Ogunyemi, 2022).



AI-driven career guidance systems can analyze labor market trends and student data to provide personalized career advice and development plans. These systems can help students identify their strengths and interests, suggest relevant courses and extracurricular activities, and connect them with internship and job opportunities. By offering tailored career support, AI ensures that graduates are better prepared for the job market and can transition smoothly into their chosen careers (Holmes et al., 2019).

Policy and Regulatory Framework for AI in Nigeria's Higher Education

The integration of Artificial Intelligence (AI) in Nigeria's higher education system necessitates a robust policy and regulatory framework to address the complexities and ensure ethical and effective implementation. This section discusses the existing policies, the need for new regulations, and the challenges associated with creating a comprehensive framework for AI in higher education, citing recent authors to provide context and support.

Existing Policies and Frameworks

Nigeria has begun to acknowledge the importance of AI and technology in education, but there is still much work to be done in establishing comprehensive policies and regulatory frameworks. The Nigerian government has implemented various ICT and digital education policies aimed at enhancing technology use in schools. For instance, the National Policy on Information and Communication Technology (ICT) in Education seeks to integrate ICT into all levels of education, promoting digital literacy and competence (Ogunyemi, 2022).

Need for Comprehensive AI Policies

The rapidly evolving nature of AI necessitates a proactive approach to policy development. Comprehensive AI policies should encompass several key areas, including data privacy, ethical considerations, and the professional development of educators.

Data Privacy and Security

AI in education involves the collection and analysis of vast amounts of student data. Ensuring the privacy and security of this data is paramount. Nigeria currently has the Nigeria Data Protection Regulation (NDPR), which provides a framework for data protection and privacy (Akinyele & Ojo, 2023). However, there is a need for more specific guidelines on how educational institutions should handle AI-generated data.

Conclusion

The integration of Artificial Intelligence (AI) into Nigeria's higher education system presents a significant opportunity to enhance educational practices, improve institutional efficiency, and address long-standing challenges. However, realizing the full potential of AI requires a thoughtful approach to policy development, regulatory frameworks, and implementation strategies. The discussion highlights the importance of establishing comprehensive policies, addressing ethical and practical challenges, and investing in resources and training.

Recommendations

Develop Comprehensive AI Policies: Nigeria should develop specific policies tailored to AI integration in higher education. These policies should address key areas such as data privacy, ethical considerations, and the use of AI tools in educational settings. Ensuring that these policies are clear, detailed, and up-to-date will help institutions navigate the complexities of AI technology and ensure responsible usage (Adeoye & Olumuyiwa, 2021).

Enhance Data Privacy and Security: Strengthen regulations surrounding data privacy and security to protect student information collected through AI systems. Institutions should implement robust data protection measures and ensure compliance with existing regulations such as the Nigeria Data Protection Regulation (NDPR). Regular audits and updates to security protocols are essential to safeguard against data breaches and unauthorized access (Eke, 2020).

Establish Ethical Guidelines for AI Use: Create ethical guidelines and frameworks to govern the use of AI in education. These guidelines should address issues such as algorithmic bias, fairness, and transparency.



Regular monitoring and auditing of AI systems should be conducted to identify and mitigate biases and ensure that AI applications are used ethically and responsibly (Adeoye & Olumuyiwa, 2021).

Invest in Infrastructure and Resources: Invest in the necessary infrastructure and resources to support AI integration in higher education. This includes upgrading technological facilities, improving internet connectivity, and providing access to AI tools and platforms. Adequate funding and resources are crucial for effective implementation and ensuring that institutions can fully leverage AI technologies (Akinyele & Ojo, 2023).

Promote Continuous Professional Development: Implement ongoing professional development programs focused on AI literacy and skills for educators. These programs should provide hands-on training, workshops, and courses to help educators stay updated with the latest AI technologies and pedagogical strategies. Continuous learning opportunities will enable educators to effectively integrate AI into their teaching practices (Ogunyemi, 2022).

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