



**NIGERIAN JOURNAL OF EDUCATIONAL PHILOSOPHY**

**PHILOSOPHY, ARTIFICIAL  
INTELLIGENCE, AND DIGITAL  
EDUCATION**

**VOLUME 35 NO. 2, OCTOBER, 2025**

**ISSN: 0794-0114  
e-ISSN: 2971-5652**

Published by

**PHILOSOPHERS OF EDUCATION ASSOCIATION OF NIGERIA (PEAN)**  
[www.peanpapers.com.ng](http://www.peanpapers.com.ng)

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# **IMPACT OF ARTIFICIAL INTELLIGENCE ON TEACHING AND LEARNING IN NIGERIA TEACHER EDUCATION**

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### **Abstract**

This paper explores the transformative impact of Artificial Intelligence (AI) on the teaching and learning of philosophy of education, and its far-reaching implications on teacher education. Artificial Intelligence (AI) is transforming teacher education in Nigeria, necessitating a re-evaluation of philosophy of education. AI's impact on teaching methods, teacher roles, and emphasis on human skills is significant. As AI revolutionizes the education landscape; the contextualized learning, inclusive education, and ethical consideration are crucial in this AI era. The paper examine how AI-powered tools are reshaping the way philosophical concepts are delivered and absorbed. Teacher education must adapt to prepare educators for AI-integrated classrooms, prioritizing AI literacy, pedagogical innovation, and ethical awareness. This shift will shape the future of teaching and learning in Nigeria, requiring a responsive and adaptive philosophy of education. The paper argue that AI can enhance learning outcomes, critical thinking, personalize learning and promote ethical inquiry, but also perpetuate existing biases and reinforce dominant ideologies. The paper also proposes a framework for AI-mediated philosophy of education that prioritizes human value,

critical reflection, and inclusive dialogue essential for teacher education in the AI era. The researcher discuss the potential consequences for teacher education, including the preparation of future generation for the AI-driven society, the cultivation of responsible AI development, and fostering of critical thinking and problem-solving skills to address complex societal challenges. Ultimately, this paper calls for a nuanced understanding of AI's role in philosophy of education and its implications to teacher education.

**Keywords:** Artificial Intelligence, teaching and learning, philosophy of education and Teacher Education

## Introduction

The integration of Artificial Intelligence (AI) in education hopefully will transform the teaching and learning processes. It is also believed that in the field of philosophy of education, AI has the potential to revolutionize the approaches to ethical, metaphysical and epistemological inquiries in Nigeria where teacher education is a critical component of educational system. The impact of AI on the teaching and learning of philosophy of education is an area that requires urgent attention. According to a report by the UNESCO Institute for Information Technologies in Education (2020), AI has the potential to enhance teacher professional development and improve student learning outcomes. This article aims to explore the impact of AI on the teaching and learning of philosophy of education in teacher education in Nigeria.<sup>1</sup> Specifically, it examines the opportunities and challenges that AI presents in this context, and the implications for teacher educators, students, and the broader educational system. This contributes to a deeper understanding of the potential benefits and limitations of AI in philosophy of education and informs strategies for effective integration of AI in teacher education programmes in Nigeria.

Recently, Artificial Intelligence (AI) has become increasingly present in our lives, having a significant impact in various fields, including teacher education, and the philosophy of education. Artificial intelligence is the computer system simulation of human intelligence processes. AI has the potential to improve and enhance students' educational experiences in both teaching and learning. The aim of using AI in education is to enhance the learning experience, improve the effectiveness of instruction, and provide learners with more personalized and efficient education. The scientific field of artificial intelligence deals with developing and investigating technology that have the purpose to enhance human intelligence. Artificial intelligence, or AI, technology has permeated every part of our educational life. AI has the potential to completely transform education, teacher education and philosophy of education from student engagement to instructional methods, and even assist learners of all stripes comprehend course topics more precisely.

What is the relationship between philosophy and AI? Philosophy, with its inquiries into the nature of knowledge, reasoning, and consciousness, has played a pivotal role in shaping the foundations of AI. One of the fundamental questions that philosophers have grappled with is the nature of human intelligence. Philosophical theories of logic, reasoning, and language have provided the groundwork for computational models and algorithms of AI systems. Moreover, philosophical debates around consciousness, perception, and moral

reasoning have spurred discussions on whether AI can possess these qualities and what ethical implications arise from creating intelligent machines. These philosophers argued that the mind works according to logical rules. Given a set of logical rules, one can build systems in the material world, systems that mimic the application of philosophical rules. It is essential to make certain that the implementation of AI in educational settings caters to the requirements of students and serves their best interests, without undermining the function of educators or the standard of education as a whole. It is highly likely that the education of the future will involve a combination of traditional and innovative teaching methods.

Additionally, it is possible that particular aspects of traditional educational philosophy may be modified or adapted in response to advancements in technology and changes in society. For instance, the application of AI in the field of education has the potential to personalize learning and provide access to a wider range of educational materials. The absence of AI-enhanced tools in classrooms can widen the educational divide in teaching and learning. In regions with limited AI integration, students might be confined to traditional learning methodologies, which may not cater to diverse learning styles or offer personalized learning experiences. Such an environment can inhibit the cultivation of 21st-century critical skills, including algorithmic thinking, data literacy, and the ability to interact effectively with technology. Furthermore, the delay in adopting AI-enhanced learning technologies can result in a misalignment between educational outputs and the evolving demands of the labor market. Teacher educators increasingly seek the interfacing with AI systems, interpreting data-driven insights, and applying these competently within their roles. Educational institutions that fail to incorporate AI into their curricula may leave their students at a significant disadvantage, struggling to secure their place in an AI-integrated job market.

## Conceptual Classifications

### Artificial Intelligence

As technology advances, the education industry is embracing the potential of AI to create smarter classrooms that enhance the learning experience for students and educators alike. From personalized learning to adaptive assessments, AI redefines how to approach education. It can improve student learning outcomes, enhance teaching practices, and optimize educational processes. AI is a rapidly developing technology that involves the creation of intelligent machines that can perform tasks typically requiring human intelligence, such as creative learning, problem-solving, and decision-making. The researcher explore the benefits and real-world usage of AI in philosophy of education, highlighting how it can support teacher educators in addressing the unique needs of individual students and fostering greater engagement and deeper understanding.

Artificial Intelligence (AI) is the ability of digital computers or computer-controlled robots to perform tasks commonly associated with intelligent beings.<sup>2</sup> The traditional goals of AI research are reasoning, knowledge representation, planning, learning, natural language processing, perception and support for robotics. AI in education helps teacher educators identify gaps in student knowledge and provide targeted feedback to improve learning outcomes. Thus, with the help of [AI-powered chatbots](#) and virtual assistants, teacher

educators can provide students with immediate support and assistance outside the classroom, helping them stay engaged and motivated. AI in philosophy of education can identify besieged students earlier on and provide targeted support to help them succeed. AI-powered tutoring systems leverage advanced algorithms to offer students personalized and real-time feedback. As students engage with learning resources, the AI analyzes their responses, identifies areas of difficulty, and tailors explanations to enhance comprehension. This individualized approach helps bridge gaps in understanding, adapting the learning pace accordingly. By providing immediate assistance and adapting to diverse learning styles, these systems empower students to grasp complex concepts more effectively. The continuous interaction of AI fosters a dynamic learning environment, boosting student confidence and overall academic performance.

AI assists in curriculum planning by analyzing educational data to identify trends and gaps in learning outcomes. It can suggest updates and adjustments to curricula based on real-time insights and evolving teacher education standards. Additionally, AI can automate aligning curricula with specific learning objectives, ensuring that educational content remains relevant and up-to-date. This streamlining of curriculum planning allows teacher educators to make data-driven decisions and allocate resources more effectively, ultimately improving the quality and relevance of education. In a traditional educational setup, students have varied abilities and learning preferences. However, the conventional approach is often needed to cater to these differences more effectively. This is where the [integration of AI](#) into philosophy of education becomes valuable. Using AI, educational platforms can create a personalized learning experience for every student. Furthermore, incorporating technologies like machine learning allows the system to adapt to the unique ways each student grasps concepts, thereby reducing their cognitive load.

AI in philosophy of education aims to address students' individual needs by offering AI-enhanced learning activities, customized educational programs, and other tailored features. This approach ensures that students receive content and resources that align with their learning styles, promoting engagement and more effective learning outcomes. The philosophy of artificial intelligence is a branch of the [philosophy of mind](#) and the [philosophy of computer science](#) that explores [artificial intelligence](#) and its implications for knowledge and understanding of [intelligence](#), [ethics](#), [consciousness](#), [epistemology](#), and [free will](#).<sup>3</sup> Furthermore, the technology is concerned with the creation of artificial intelligence that enhances teacher education theory and practice in Nigeria education system. Life-long learning is crucial for both teacher educators and learners to stay ahead of the teaching practices. Teacher educators must continuously update their knowledge and teaching practices to provide the best learning experiences for their learners. The learning-to-learn competency is another essential skill for the evolving era of AI that is characterized by rapid changes and continuous transformation. AI-powered learning platforms and teaching technologies can provide teacher educators with access to the latest research, teaching resources, and trends in education, and enable them to stay up-to-date with the latest teaching and learning industry trends.

## **Integration of Artificial Intelligence (AI) in Teaching and Learning**

The integration of artificial intelligence (AI) in teaching and learning necessitates a fundamental re-examination of the underlying philosophical principles and values that guide educational practices, as AI's capabilities to process information, provide personalized learning experiences, and automate grading challenge traditional notions of teaching, learning, and knowledge acquisition. From a philosophical perspective, the incorporation of AI in education raises essential questions about the nature of knowledge, intelligence, and cognition, as well as the role of teacher, students, and technology in the learning process. For instance, AI's ability to provide personalized learning experiences and adapt to individual student's needs and abilities challenges the traditional one-size-fits-all approach to education and raises questions about the importance of human teachers in providing emotional support, guidance, and mentorship.

Furthermore, AI's capacity to automate grading and assessment tasks prompts philosophical debates about the nature of intelligence, cognition, and knowledge acquisition as well as the role of assessment and evaluation in the learning process. The integration of AI in education also raises philosophical concerns about issues such as bias, equity, and access, as AI systems can perpetuate existing inequalities and biases if they are not designed and trained with diverse and inclusive data sets. Ultimately, the integration of AI in teaching and learning requires educators, policymakers, and philosophers to engage in critical reflections about the fundamental purposes and values of education as well as the ethical implications of using AI in educational settings.

Philosophy of education explores fundamental questions about the nature of education, learning, and teaching. It examines the purposes and goals of education, the relationship between teacher and student, and the curriculum's content and structure. AI on the other hand, refers to the development of computer systems that can perform tasks that typically require human intelligence, such as learning, problem-solving, and decision-making.<sup>4</sup> The integration of philosophy of education and AI raises important questions, including: what is the purpose of education in the age of AI? How can AI be used to support or augment human teaching and learning? What are the ethical implications of using AI in education? And how can one ensure that AI systems are designed and used in ways that align with human values and promote social good?

The positive and negative effects of artificial intelligence (AI) on teacher education (philosophy of education) are possible. On the positive side, AI has the potential to improve teacher education (philosophy of education) by making it more adaptable, productive, and engaging for each individual student. Artificial intelligence (AI) has several potential educational applications, including but not limited to: monitoring and adjusting curriculum based on student performance; providing students with tailored recommendations; and facilitating independent study.<sup>5</sup> There are, however, potential detrimental effects of AI on classroom instruction that should be taken into account. Concerns have been raised that AI could be utilized to replace human instructors in functions as teacher educators.

Philosophically, this raises questions about the teacher's role: should AI replace some aspects of teaching? Can it enhance the human connection crucial to education rather than diminish it? Teachers may shift towards being facilitators of learning rather than direct providers of knowledge, guiding students in critical thinking, creativity, and emotional development. The integration of Artificial Intelligence (AI) into philosophy of education is not merely a technological upgrade but a philosophical shift in how to perceive learning and development. As AI becomes more prevalent in classrooms, it brings with it a host of philosophical questions and challenges that teacher educator, parents, and society must contemplate.

This article explores the multifaceted relationship between AI and philosophy of education, considering the implications for pedagogy, ethics, teacher education and their intellectual development. The impact of AI on teacher education (Philosophy of education) is significant, with both opportunities and challenges arising from the integration of AI in teacher education settings: critical thinking, AI can facilitate critical thinking by providing students with complex problems to solve, encouraging nuanced perspectives, and developing ethical reasoning; ethical inquiry, AI raises important ethical questions related to bias, privacy, and transparency by promoting philosophical discussions on responsible development and use of AI; epistemology, AI challenges traditional notions of knowledge and truth, as machine learning algorithms can generate new insights and knowledge that may not be human-readable; pedagogy, AI-powered adaptive learning systems raise questions about the role of teachers, the nature of learning, and the relationship between technology and pedagogy; and philosophy of mind, AI's ability to simulate human thought and behaviour raises questions about the nature of consciousness, free will, and the human condition.<sup>6</sup>

## **Teacher Education**

An integral part of general educational system in Nigeria today is teacher education, as teachers influence the growth and development of a nation. Teachers therefore should be provided with necessarily current trainings in order for them to be functional in teaching and learning that involves the training of teachers to acquire on-job training. Teacher education in Nigeria has been undergoing changes across the country right from the missionary activities through the Colonial era to the post-independence era and modern period, all along, the situation has not been static, especially if the educational systems want to meet the demands and correct the status quo anomalies in educational system. To this end, since the end result of philosophy of teacher education programme in Nigeria should be the production of individual teachers that are knowledgeable, efficient and effective on their job, then, there should be provision for more instructional materials in form of teaching aids and knowledge of AI to aid teachers on their job. The goal of teacher education in Nigeria includes, among others, 'the encouragement of the spirit of enquiry and creativity in teachers, and providing them with the intellectual and professional background that will be adequate for their assignments and also make them adaptable to changing situations' (FRN, National Policy on Education, 2014). Section 8B (item 74) of the policy noted that teacher education shall continue to take cognizance of changes in the methods and curriculum and teachers be regularly exposed to innovations in their profession.<sup>7</sup>

The National Policy on Education prescribes that the NCE Certificate shall be the minimum qualification for all teachers in our schools. The Policy makes it mandatory for all teachers in Nigeria to be given the basic training and stipulates that, Nigeria Certificate of Education (NCE) should be the minimum qualification to the profession. The policy also provides that “teacher training shall continue to take cognizance of changes in methodology; societal needs as reflected in the curriculum and those teachers shall be regularly exposed to innovations in their profession. It further recognizes the need for in-service training as an integral part of continuing teacher training. The statutory responsibility for teachers’ training in Nigeria today is vested in College of Education, Institutes of Education, Polytechnics, National Teachers Institute (by distance) and University Faculties of Education. The curriculum for NCE teachers is carefully designed to produce teachers exposed to a competent practice. To achieve this mandate, the training will provide continuous professional development for leaders across the education sector, with a view to building on existing competencies and keeping them abreast of emerging practices and trends.

Teacher education qualities and qualifications in the era of technology is a must for would be-teachers to perform for effective teaching and learning processes. Thus, the policy stipulations therefore, the professional training of teachers is two-fold: pre-service and in-service trainings. Increasing globalization and the emergence of the knowledge economy are calling into question traditional perspectives on the transformational capacity of education systems and the conceptions of teaching as a profession and the roles of teachers. This piece has elucidated the major trends and developments in teacher education from missionary period to colonial era and pre and post-independence era in Nigeria. Teacher education in Nigeria today is facing some problems leading to the shortages of the profession. Such problems include lack of recognition of teacher education by the government, non-professionalization of the occupation and lack of effective teacher organization and so on.

How well Nigerians respond to the above and many other challenges will depend upon her capacity to provide expanded opportunities in the building of stronger competencies for the Nigerian student through high-quality schooling. Apart from the pressure of globalization, other challenges such as the rapid technological advancements (AI), changing patterns of teaching and learning, explosion in information access and use all make the inculcation of 21st century skills imperative. Since teachers are key personnel in realizing the national goal of a knowledgeable society, essentially teachers need to be lifelong learners themselves in order to shoulder the heavy responsibilities entrusted on them and be capable of positively influencing the students in their thoughts, behaviours and lifestyle.

### **The Role of AI in Enhancing Teaching and Learning (Philosophy of Education)**

The teacher education will need philosophy of education to be able to put order, harmony, and meaning to the different and conflicting data that will emerge in an effort to solve the problems encountered. AI can profoundly enhance educational experiences by providing personalized learning paths. AI systems can analyze a student’s performance in real-time, adapt to their learning pace, and offer tailored educational materials to suit their needs. For instance, AI tutors can help students with specific subjects by providing explanations, resources, and quizzes at the right level of difficulty to challenge their abilities while also

promoting understanding. Philosophical argument may also nurture discussions about the role of teacher education, focusing on the balance of trust that may reasonably be afforded to teachers, as professionals responsible for holding their own behaviour to account; or the extent to which mechanisms of public governance of teaching and teacher education are needed.<sup>8</sup>

Philosophers of education have long debated whether teacher education, and in particular the education of effective teachers, is a matter that may be best addressed through empirical research, rather than philosophical argument. Artificial intelligence (AI) can transform the teaching and learning of philosophers of education in various ways: Personalized learning in AI can help tailor learning experiences to individual teachers' needs and abilities, helping them grasp philosophical concepts more effectively; Intelligent mentoring in AI-powered systems can provide one-on-one guidance and feedback and guidance on philosophical topics, such as ethics and metaphysics, simulating the role of an experienced mentor; Content analysis in AI can help analyze and understand complex philosophical texts, identifying key concepts and themes; Virtual discussions in AI can facilitate simulated discussions allowing teachers to engage with philosophical ideas and pedagogical approaches in a more interactive and immersive way AI can facilitate simulated debates and discussions, allowing students to engage with philosophical ideas and develop critical thinking and argumentation skills; and continuous professional development,<sup>9</sup>

AI can provide teachers with personalized recommendations of professional development, helping them stay up-to-date on best practices in philosophy of education. AI has the capability to transform the role of teacher educators, allowing them to transition from purveyors of information to facilitators of critical thinking and problem-solving. Without AI tools, philosophy of educators are deprived of the means to harness data to improve teaching strategies and learning outcomes. It is crucial to recognize that the integration of AI in philosophy of education is not merely an add-on, but a foundational shift in the approach to teaching and learning of science and technology. This shift necessitates strategic investments in infrastructure, teacher education, and curriculum development. It also requires ethical consideration to ensure equitable access and the prevention of bias in AI algorithms that could otherwise exacerbate disparities.

The future of philosophy of education is inextricably linked to AI, and the delay in its adoption is not a mere technical hitch but a critical lapse that could have long-lasting implications. It is incumbent upon policymakers, teacher educators, and the technological collaboratively to surmount these challenges, ensuring that education systems are not just catching up with technology, but are at the forefront of its advancement. For philosophy of education to thrive amidst technological upheaval, a transformative blueprint that integrates AI-driven methodologies is paramount. This strategic blueprint must encompass infrastructural upgrades, educator empowerment, and an inclusive approach to ensure universal access to AI-enhanced learning. The core of this transformation is infrastructure. Educational institutions must be equipped with the hardware and software necessary to support AI technologies.

Teacher educators must be up skilled to navigate the intricacies of AI tools and platforms. This involves not only technical training but also a pedagogical shift to integrate

AI seamlessly into the curriculum. When teacher educators are confident in utilizing AI, they can better guide students through the nuances of these technologies, fostering an environment where AI complements the learning journey. An inclusive approach is fundamental to ensuring that the benefits of AI in education are equitably distributed. This means making AI-enhanced learning tools accessible to all students, regardless of socio-economic backgrounds. It also involves tailoring AI-driven content to cater to diverse learning needs, ensuring that the educational benefits of AI are not confined to a privileged few.

Additionally, ethical considerations around data privacy and the potential for algorithmic bias must be rigorously addressed to prevent the inadvertent perpetuation of inequality. AI's role in philosophy of education is not just as a facilitator of learning but as an enabler of a more adaptive, personalized, and engaging educational experience. AI literacy goes beyond understanding the operational aspects of AI technologies; it encompasses a comprehensive awareness of their impact, potential biases, ethical implications, and the ability to interact with these systems effectively. This literacy is not just for students but also for the teacher educators who are the architects of learning experiences. The teacher educators must possess the acumen to discern the appropriateness of AI applications within their teaching methodologies. It demands a departure from traditional instruction and a pivot towards a curriculum that is interwoven with AI-centric problem-solving tasks. The educators' role evolves from knowledge transmitters to facilitators of knowledge discovery, where AI becomes a dynamic partner in the educational process.

Bridging this gap necessitates policies that drive investment in digital infrastructure, especially in underprivileged areas, and a commitment to creating open-source educational materials that demystify AI. This calls for a cultural shift within educational institutions, encouraging a mindset of adaptability and lifelong learning. It is only through the creation of a supportive environment that nurtures curiosity and the willingness to experiment with AI that such barriers can be overcome. AI literacy is not a luxury but a necessity in the modern educational paradigm. As educational institutions navigate this transition, the focus must remain steadfast on enabling every stakeholder to not only use AI but to understand and shape its trajectory within the philosophy of education framework. The future will belong to those who can harness the power of AI to augment human potential, and the foundation for this future is being laid today in classrooms for global competitiveness.

### **Educational Challenges of Artificial Intelligence in Nigeria**

The rise of Artificial Intelligence poses significant challenges to the teacher education in Nigeria, necessitating a rethinking of the purpose of teacher education in light of AI's ability to process information and perform tasks, which may shift the focus from knowledge acquisition to skills like creativity, critical thinking, and emotional intelligence. Furthermore, AI could potentially replace some teaching functions forcing a redefinition of the teacher's role and the human touch they bring to education. Additionally, the integration of AI in education may exacerbate existing inequalities making it essential to address the digital divide and ensure equal access to AI-powered resources for all students. To mitigate these risks, it is crucial to ensure accountability and transparency in AI's decision-making processes to avoid biases and

errors. Ultimately, teacher education programmes must adapt to prepare teachers for an AI-driven classroom, emphasizing skills like adaptability, collaboration, and problem-solving. Moreover, teacher education programmes in Nigeria must prioritize cultural sensitivity and contextualization, taking into account the country's unique cultural context, values, and beliefs to ensure education remains relevant and meaningful.

Ensuring that AI-powered education systems do not widen the gap between urban and rural students in Nigeria is crucial to promoting equitable access to education. The limited internet connectivity and infrastructure in Nigeria pose significant challenges to the effective deployment of AI-powered education systems. Developing AI-powered education systems that are tailored to the specific needs and context of Nigerian students is essential to ensuring their effectiveness. Teacher education in Nigeria needs adequate training and support to effectively integrate AI-powered tools into their teaching practices and improve student outcomes. Strategies for addressing technical issues and providing support for AI-powered education systems must be developed to minimize disruptions and ensure continuity. Ongoing maintenance and updates are necessary to ensure AI-powered education systems remain relevant and effective in Nigeria's rapidly changing education landscape. Frameworks for evaluating the effectiveness and impact of AI-powered education systems must be developed to ensure they meet their intended goals. AI-powered education systems in Nigeria must align with the country's national goals and objectives to ensure coherence and consistency.

## **Conclusion**

The integration of AI in teacher education in Nigeria is poised to revolutionize the teaching and learning of philosophy of education. While there are challenges to be addressed the potential benefits of AI in enhancing student learning outcomes, improving teacher efficiency, and promoting accessibility and inclusivity in education cannot be overemphasized. As Nigeria embraces the fourth industrial revolution it is essential to harness the power of AI to develop a future-ready workforce, equipped with the skills and competencies required to navigate the complexities of the 21st century. To fully leverage the impact of AI on teaching and learning, teacher education programmes in Nigeria must prioritize the development of AI literacy, critical thinking, and problem-solving skills, ensuring that future educators are empowered to effectively integrate AI in their practice. Ultimately, the strategic adoption of AI in teacher education will not only transform the philosophy of education but also foster a culture of innovation, creativity, and lifelong learning, positioning Nigeria for sustainable development and global competitiveness.

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