



Leveraging Artificial Intelligence Technology on Teacher Education programs among higher institutions of learning: A Bane or Blessing for sustainable quality Education in Nigeria?

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Abstract

In spite of the substantial body of studies carried out on the effects of Artificial Intelligence on teacher education programs in Nigeria, nuances of opinion abound on whether AI is a blessing or bane in the teaching learning process. Some scholars believed that the infusion of AI into the teacher education programs is a blessing because it helps to make work easier for students, it can function as a reliable research partner, and it can offer personalized learning resources, video, articles, and interactive activities among others. Conversely, the critics of AI justified their position by claiming that AI undermines critical thinking skills for students and teachers alike. In addition, AI correlates with increased students' laziness because of a loss of human decision making and lastly, robust classrooms interaction will be greatly minimized if not totally obliterated. This paper, therefore, critically examines the concept of teacher education, Artificial Intelligence, its usefulness and limitations and offers suggestions on how balance could be struck between Artificial Intelligence (AI) and Human Intelligence in teacher education programs in Nigeria.

Keywords: Artificial Intelligence, Teacher Education, Personalised learning resources, Human intelligence

Introduction

The traditional African society prior to the advent of colonialism had forms of teaching and learning systems in which the parents or elders inculcated societal norms and values on the younger generation or to one another. This kind of education is purely informal as there was no organised body of knowledge and curriculum. Every adult in the community was regarded as a teacher. The system was didactic, simple and pragmatic. It was didactic because it emphasized moral aspect of life; virtues like honesty, truth, hardworking, respect for elders were taught. It was simple because there was no formal training for the teacher; the process depended on everyday experiences using tangible and intangible materials found in the environment such as artifacts, crafts, natural resources, festivals, folklores, arts, proverbs, idioms etc. to aid teaching and learning which are still in use today to preserve our cultural heritage. The pragmatic aspect of African education lies in fact that the recipient of the education did not look for job after graduation. For example, the child of a carpenter automatically learns his father's skill and practices it after mastering the skill of carpentry. The same goes for the child of a farmer and other professions. Today, education and teaching have taken a new dimension as there are trained persons entrusted with the right and responsibilities to carry out teaching function, otherwise called teachers. What is referred to as teaching today takes place whenever there is a deliberate structured process of facilitating learning, imparting knowledge, skills and values to others. It is both an art and a science that involves designing educational environments, guiding learners, and fostering critical thinking. Consequently, individuals referred to as teachers must pass through some specific and specialized training through designated platforms and specialised programs and process called 'Teacher Education'. In agreement with the above, and given the specialised teachers' role in the developmental process of all individuals and the nation, the Federal Government of Nigeria presently places high premium on the teaching profession as revered in the National Policy on Education which states among other goals of teacher education is to produce highly motivated, conscientious and efficient classroom teachers for all levels of education system, provide teacher with intellectual background and professional background adequate for their assignment and to make them adaptable to changing situations (Federal Republic of Nigeria, 2013). Lending credence to the National Policy on Education, Obanya (2011) sees the existing profile of teacher as professional with a minimum of Nigerian Certificate in Education having gone through general education for 3 years as in the Nigerian case. Such a person is usually described as a qualified teacher. However, Obanya (2011) notes that a qualified teacher is not necessarily a competent teacher; also, a competent teacher is not necessarily an efficient teacher while an efficient teacher is not necessarily an effective teacher. He further explains that a qualified teacher is one with the



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requisite/prescribed minimum general and professional qualifications. Here, the emphasis is on undergoing prescribed courses and being crowned with an approved certificate that confers an approved qualification. A competent teacher is one who, in addition to being qualified, is also knowledgeable in methods and principles of promoting learning in students. Higher on the scale is the efficient teacher, who is able to apply the prescribed teaching methods 'as directed'. Higher still is the effective teacher, who has mastered the prescribed methods, but applies them creatively, and as a result ensures quality learning students. While this paper agrees with assertion of Obanya (2011) that the 21st century should be efficient, it adds that today's teachers should align with the competitive contemporary global community, via global best practices, brought by the emerging technologies such as artificial intelligence. Mormah & Bassey (2011) aver that the essence of teacher education is to inculcate in a would-be teacher, acceptable attitudinal, behavioural, knowledge, values and skills approvable by educational and socio-political policy makers and implementers. According to Ukoha (1999), the way to train teachers with these cherished qualities is through professional teacher training that will result in an educated person who possesses a firm grounding of chosen subject matter. Apart from all the attributes mentioned above, an effective teacher should be aware of the role of modern technologies in teacher education program. Technology has the potentials for making teaching easier and its spread has been quite breath-taking even in the third world countries. It is therefore expected of a 21st century teacher to be acquainted with the latest technology so as to make his classroom more engaging, compelling and interactive.

Emerging Technologies and Teacher Education

Today's digital age, where we have various technologies for teaching and learning, has brought a new face of teachers to the classroom. It is an interconnected, communication and technologies intensive age, borderless in its reach, using computer and the internet to create a world of e-everything: e-learning, e-commerce, e – banking, e – governance, e – roting, e – publishing, e – book, e – library, e – dating etc. The 21st century classroom, therefore, requires a new face of teachers with an ICT complaint status and mindset to support the teaching processes: new technologies bring fundamental changes to the lines of 21st century learners, who are the most frequent users of emerging technologies and online service (OECD, 2016). To key into global best practices in education, FRN (2013) stated that, teaching and learning should be activity-based, learner – centred and experimental as well as Information Technology (ICT) supported. The emerging technologies include the internet backbone as well as other electronic media devices and facilities that ensure E – learning such as: broad broadband desktop, laptop, tablets, smartphones, and other hand-held devices, wide range of electronic technology devices such as radio, cassette tapes, audio streams, downloadable packages, internet services, television, Ipad, interactive boards etc. The latest of the emerging technologies in teacher education is Artificial Intelligence which is the concern of this paper.

Concept of Artificial Intelligence

Artificial Intelligence refers to a machine or computer system's ability to perform tasks that would typically require human intelligence. It involves programming system to analyse data, learn from experiences, and make smart decision – guided by human input. According to Oluwole (2025), AI is revolutionizing education, reshaping how knowledge is delivered, accessed and evaluated. In other words, the scholar seems to say that integration of AI into learning environments has initiated a paradigm shift that transcends traditional classroom boundaries. In recent time, Artificial intelligence has been in the spotlight. Countless academic conferences in Nigeria and beyond have their themes on what AI can do and what it cannot do. The theme seems over- flogged and educators and scholars are divided over whether the attention given to the AI literally worth it. Some vehemently oppose its usage leveraging on the fact that not all information given by AI are absolutely correct and it could also make students and teachers as well intellectually lazy. However, scholars like Luan, Geczy, Lai, Gobert, Yang, Ogata (2020) are of the opinion that, ignoring this new technology because of the perceived dangers is like throwing away the baby with the bathwater. It is also a considered opinion of some scholars like Musa (2021), Rodinadze & Zarbazola (2012), that educators need to strike a balance between AI technology as an aid for teaching and learning while still encouraging face to face interactions between teachers and learners.

Benefits of AI in Teaching Education Programs

Surprising shifts emerge as machines begin helping those who teach others. Some now see classrooms guided by smart systems instead of just humans alone. A shift unfolds quietly - tools learn patterns, suggest responses, adapt to individual styles. Not magic, but math shaping feedback in real time. Questions arise about fairness, control, oversight. Still, many believe careful use brings stronger outcomes than old methods alone. Benefits of AI, according to scholars like Michalski,



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Carbonelli & Mitchell, (2013) Roll & Wylie (2016), Musa (2025) include but not limited to the following:

Personalization Meets Adaptive Learning

What makes AI stand out in training educators lies in how it shapes learning to fit each person. Instead of treating everyone the same way, smart systems study how fast someone learns, where they struggle, and what they already know - then shift materials on the fly. These changes feel natural; much like the tailored teaching methods future instructors must later use themselves. By doing so, the tech doesn't just build skills - it shows them in action. Training becomes less about rules, more about real-time example.

Smart Feedback and Grading

Out here, AI reshapes how assessments unfold in teacher training programs. Using pattern recognition and text analysis tools, these systems review lesson designs, personal reflections, and professional collections faster and more precisely than human grading typically allows. What stands out most? Instant feedback loops - offering useful insights right when they matter. Future teachers get suggestions quickly, sometimes minutes after submitting tasks, helping them adjust and grow without long delays. With less time spent on repetitive scoring, instructors shift toward meaningful conversations, coaching moments, and building trust - areas machines simply can't touch.

Simulations and microteaching spaces

One way AI stands out in training teachers is through lifelike simulations where risks are minimal. Instead of real students, future educators face digital ones, each programmed with unique reactions and challenges. From behind a screen, they try different teaching styles, test how well they handle disruptions, or see if their questions spark thinking. Mistakes happen here without consequence, part of the process rather than something to fear. Feedback follows - sharp, specific, focused on timing, tone, clarity, how learners respond. Real classrooms wait beyond these trials, intense and unforgiving by comparison. Old methods like short mock lessons feel limited next to what these systems provide, packed with insights and room to adapt.

Knowledge and Professional Resources Access

Sometimes a quiet tool opens doors that once seemed stuck. Instant answers appear when student teachers ask, not through endless scrolling but by tapping into smart systems full of teaching methods backed by evidence. Curriculum maps, real classroom examples, plans ready to adapt - these come together without digging through dusty archives. Help shows up right when it's needed, shaped around the situation at hand. Faraway colleges or schools with little often miss out on fresh ideas and expert insight. Now gaps shrink because support travels fast, skipping roads and borders. Old limits fade when information moves like conversation.

Inclusive and Equitable Teacher Preparation

Learning tools powered by technology might help balance chances for everyone in teacher training. Real-time typing, translation features, or spoken text options open doors - especially when someone faces hearing challenges, speaks another language at home, or learns differently. Faculty members gain support too; software spots trends among varied groups of future teachers, uncovering how background shapes classroom experience. That shift matters - it turns digital helpers into levers for fairness instead of just time savers.

Data Driven Mentoring and Ongoing Skill Growth

Starting fresh each time, artificial intelligence reaches past first training into how educators grow later on. Because it tracks what happens in classrooms - like notes from visits, scores from learners, feedback forms - it shapes custom learning steps for active instructors. Supervisors spot patterns clearly, seeing where someone shines or struggles, thanks to clear snapshots built from real input. Instead of guessing, those guiding others now lean on solid clues, making talks sharper and more useful. Moving away from vague hunches toward grounded insight lifts help for teachers, whether they just started or have years behind them. All things considered, many see artificial intelligence bringing strong tools to teacher training - custom learning paths, smart responses, realistic practice settings, fairer access to information, broader inclusion, backed by insights from data. Still, these advantages show up clearest when schools avoid blind acceptance, choosing careful, teaching-focused steps instead. Best outcomes happen when people stay in charge - guiding choices with insight, care, and experience. At its strongest, AI works quietly beside educators, supporting what humans do best in shaping future teachers. There are dissenting views when it comes to application Artificial Intelligence in teacher education programs as AI was perceived as a bane to the teaching and learning processes. To clearly explain this, the author will refer to his background as a language educator.

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The writer notes that AI in language learning does not possess ability to fully understand the nuances and complexities of human language. While AI systems can recognize and analyse individual words and phrases, they may struggle with understanding idiomatic expressions or sarcasm. As a result, relying solely on AI for language learning may lead to student missing important cultural context or making embarrassing communication errors. Again, while AI programs can adapt—p00p their lessons based on students' performance, they cannot entirely replicate the level of personalization that comes from working with human tutor or teacher. Additionally, not all students learn in the same way, meaning that AI programs designed for one type of learner may not be effective for another. Furthermore, the absence of interpersonal interaction is one of the banes to learning process. Albeit AI can give students access to a variety of knowledge and resources, it cannot take the place of the advantages of speaking with human teacher or conversation partner. Human Interaction allows for more personalized and adaptive learning experience. A teacher can tailor their lessons to match a student learning style and pace while also providing immediate feedback on pronunciation and grammar. Also, conversing with native speaker allows learners to practice real life communication skills and pick up on cultural nuances that may not be captured by an AI program. Besides, AI have revolutionized the way we communicate across language barriers. These tools leverage complex algorithms and machine learning techniques to provide near human translation of text for speech. However, their accuracy can vary depending on several factors, such as the quality of data used for training, the complexity of the source language and context-specific nuances. For instance, idiomatic expressions that do not have a direct equivalent in another language can be challenging to translate accurately.

Challenges to Artificial Intelligence use by Teachers in Classroom

The use of artificial intelligence in the classroom situation comes with its attendant challenges to teachers. According to Mormal & Bassey (2019), some of the challenges include: attitude and experience, resistance to change, level of computer literacy, technology misaligned with the curriculum and lack of vision as to how to integrate AI into learning processes and teacher related difficulties such as negative attitudes, belief and unwillingness toward technology (artificial intelligence). Other challenges are the ability to restrict the use of AI due to negative consequences and ethical issues (US Department of Education (2002). Studies have also revealed that in most educational institutions, some teachers are intimidated by technology and are very comfortable with their own established methods of teaching. Another challenge to the use of AI is over-reliance on AI which has potential to hinder the development of independent problem- solving and ethical analysis skills. in other words, it diminishes critical thinking.

Solutions and Way forward

For effective integration and use of AI in the classroom, the teacher should possess the following skills:

1. Artificial intelligence outputs be analysed, identifying limitations and formulating complex question that AI cannot answer.
2. Teachers should also collaborate human – human and human- artificial intelligence.

Conclusion

Having examined the divergent opinions on the use of artificial intelligence, the paper concludes that AI is a double-edged sword. It has its pros and cons. Ignoring artificial intelligence because of its perceived challenges and disadvantages may not be a logical decision. AI should be integrated in the teaching learning process because this new technology will reward those who can master it and punish those who ignore it.

Recommendations

Based on the conclusion above, it is recommended that:

1. Teachers should make efforts to develop themselves in the use of artificial intelligence judiciously and not see it as a bane to the teaching and learning process.
2. Artificial intelligence should also be used by teachers to augment human intelligence and capabilities.
3. In doing the above, ethical values should be considered when deploying AI in the classroom.

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