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TOWARDS EFFECTIVE INTEGRATION OF ARTIFICIAL INTELLIGENCE IN TEACHING PROFESSION IN NIGERIA: ISSUES AND THE WAY FORWARD

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ABSTRACT

Artificial intelligence is advancing at incredible speed and becoming part of our everyday lives. This is as a result of the technological advances of the last decades and the spread of digitalization in countless areas. Education is another area where information and communication technologies are an integral part of everyday life. It is therefore inevitable that artificial intelligence is ignored in the field of education. This study is theoretical in nature and examined what AI might imply for education, learning and teaching. Artificial intelligence-based technologies offer a number of benefits for students and teachers alike. The challenges to, and strategies for the effective integration of AI in the teaching profession in Nigeria are well-discussed.

Keywords: Artificial Intelligence; Teaching Profession; AI-Driven E-learning platforms and AI-based assessment tools.

Introduction

Nowadays, the use of artificial intelligence (AI) is becoming more common in many areas of life, and this is also true for education. AI-based education can take many forms an its main goal is to make education more effective. Digitalization and the appropriate use of information communication tools (ICT) are essential in today's modern world. Ralph and George (2010) described artificial intelligence as a cluster of technologies, and various computing science approaches to make flexible rational decisions that align with unpredictable environmental conditions. They also considered AI as a tool for sustainable development. The better we understand the present and the history that AI has created, the better we can understand the possibilities of the future/impact of AI in education in Nigeria. To appreciate the opportunities and challenges that Artificial intelligence creates, we need both good understanding of what AI is today and what the future of teaching profession in our nation may be when AI will be widely used in the society. Artificial intelligence can enable new ways of learning, teaching and education and it may also change the society in ways

that pose new challenges for educational institutions. It may amplify skill differences and polarize jobs, or it may equalize opportunities for learning. According to Ralph and George (2010) Artificial Intelligence systems includes the people, procedure, hardware, software, data and knowledge needed to develop computer systems and machines to display features of intelligence.

Concept of teaching profession in Nigeria

Teaching is an occupation dating from the time of human existence. However, despite its age, it has consistently lacked the command of prestige and power accorded the classical professions such as law and medicine. Teaching is a noble profession (Usman Mohammed Aklahyel, 2016). In Nigeria, teaching has remained a trade union rather than a professional organization. There are very few things that are as rewarding as making a sound difference in shaping the lives of young people, inspiring and mentoring them to become the best versions that they can be teaching goes beyond subject knowledge and the satisfaction that it provides goes beyond words. According to Oxford, teaching is "a paid occupation, especially one that involves prolonged training and a formal qualification.

Reasons For Taking Up Teaching as a Profession

According to Divyansh Bordia-09 Nov 2020 "To teach is to touch a life forever."

1. **Inspire and Influence:** as mentioned, teachers have the added responsibility of shaping future generations. Teachers have an opportunity to make a difference. You can teach them to be responsible and sensible citizens.
2. **Improvement and Learning:** teaching and learning go hand in hand. Since you will be around young, curious, minds all day, you will be able to push yourself and get better every day. When you are in an environment that asks a lot of questions and is inquisitive, you grow and develop each day. You get to polish your skills and techniques.
3. **Work Satisfaction:** the joy of making a difference and making a change in the right direction is like no other. Teaching provides job satisfaction that is like no other. Teachers have to use different teaching strategies as techniques to cater for each child.
4. **Respect:** teaching is a respectful job and people look up to teachers for the work that they do and the influence they have. Teaching is a noble profession.
5. **Potential for Growth:** the stability and job security of a teaching career ae high. The potential that teachers have is commendable and the possibilities of teaching are vast. With online teaching apps and virtual classrooms on the rise, you can teach from the comfort of your home and without any geographical restrictions.

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Brief History of Teaching Profession in Nigeria

Formal Western education in Nigeria began in 1843 while teaching profession institutions started springing up in Nigeria since 1895 when the Hope-Waddel Training Institute was established in Calabar, followed by S. Andrew's College, Oyo, in 1896. The British Colonial administration became involved in teacher training in 1914 when it establishing one institution in Bonny. In the Northern part of Nigeria, one was established in 1909 at Nasarawa and another in 1921 at Katsina. By 1925, fourteen institutions had been established in the country. Up to 1960 when Nigeria attained her independence, many teacher training institutions had been established by the Christian missionary agencies and few by the government to produce Element Teachers (Grade III) and Higher Elementary Certificate Teacher (Grade II). Also, there was Grade I Teachers Certificate which was obtained through one of two ways: A Grade II teacher who passed two Advanced Level General Certificate. Secondly, a Grade II certificate holder could attend further training in one- or two-year post Grad II Colleges of Agriculture, success in which would earn one the award of the Teachers Grade One Certificate (Ojo & Olaguwon, 2014:179).

Following the Ashby Report of 1960 which was set up for Post-School Certificate and Higher Education, Advanced Teacher Training Colleges (Now College of Education) were established as from 1962 to produce well-qualified non-graduate teachers to teach lower classes in the secondary schools. When the University of Nigeria, Nsukka (UNN) started an experimental B.A. and B.Sc. degrees in Education in 1960, it attracted sever criticism. However, the UNN blazed a trail because at present there are about 53 federal and State Universities having Faculties of Education, and 62 Colleges of Education and Polytechnics. In all these institutions, B.A/B.Sc. degrees in Education are offered. For graduate teachers who did not read Education, there is Postgraduate Diploma in Education (PGCDE) through which such teachers are groomed to attain both academic and professional competence in Education.

There has been a controversy ranging between the proponents of the B.A/BSc Education and B.A/BSc plus PGDE as which is a more appropriate teaching profession programme (Ojo & Olaguwon, 2014) favour the B.A/B.Sc. Educational programme, which combines professional teaching profession courses with the courses in a teaching subject simultaneously over a period of four years. But the proponents of the B.A/BSc plus PGDE options stress that the other option does not allow for an in-depth study of the teaching subject area. That is, in the bid to combine the two field's depth is compromised. The PGDE option, the proponents hold, allows for an in-depth study of the teaching subject over a period of four years after which one extra year is devoted entirely to professional education. However, the two options are being used in teaching profession in the country.

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Federal Government's Views on Teaching Profession in Nigeria

The overall views of federal government with regard to teaching profession as stipulated in the Federal Government of Nigeria (2013: 39) are that teaching profession shall be to:

1. produce highly motivated, conscientious and efficient classroom teachers for all levels of our educational system;
2. encourage further inquiry and creativity in teachers;
3. help teachers to fit into social life of the community and the society at large and enhance their commitment to national goals;
4. provide teachers with the intellectual and professional background adequate for their assignments and make them acceptable to changing situations;
5. enhance teacher's commitment to the teaching profession.

Challenges Facing Teaching Profession in Nigeria

The following are the problems of teaching profession in Nigeria (Nwankwo,2020; 2022; 2023):

1. Inadequate funding.
2. Poor societal perception of teaching profession.
3. Lack of commitment among teachers.
4. Lack of motivation.
5. Unethical behavior of some teachers.

In the light of these challenges, there is need for something that better the lots of teachers in the profession. The thing that comes to mind at this stage is artificial intelligence (AI).

Concept of Artificial Intelligence

Artificial intelligence can be described as the simulation of the human mind to make computers think and act like humans by performing tasks like learning and problem-solving (Zhang & Lu, 2021). Artificial Intelligence according to Benhamou and Janin (2018) stated that artificial intelligence involves a collection of technologies that enable machines to act with a very high level of intelligence similar to humans. Merriam-Webster English Dictionary (2018) stated that artificial intelligence is "a part of computer science that deals with giving ability to the machines to look as if they have natural human intelligence". This means machines performances task like intelligent beings and animals (Mc Corduck, 2004). Artificial intelligence is an area of computer science with the help of digital electronics that emphasizes the creation of intelligent machines that works and reacts like humans. Artificial intelligence application is in wide use by educators and learner from nursery to tertiary education level.

Artificial intelligence is defined as technologies used to allow computers to perform tasks that would otherwise require human intelligence, such as virtual perception, speech recognition and language translation (Fanning, 2024).

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Artificial intelligence is a technology where machines can learn and understand logic like humans. This technology is said to be able to help simplify human life which is very complex (Fitria, 2021). AI itself works by combining the presence of several data, iterative processing, and intelligent algorithms. This allows the software to learn automatically from patterns or features in the data. Artificial intelligence education software development has revolutionized traditional learning methods, from mobile digital courses to online references and virtual classrooms. This advanced technology has become integral to modern educational environments, replacing traditional teaching methods. Artificial intelligence (AI) is poised to address some challenges that education deals with today, through innovation of teaching and learning processes. In its development, artificial intelligence has also penetrated the world of education. AI systems allow people to learn with the help of education assistants such as bots. The development of the times requires the world of education to adapt to technological developments to improve the quality of education, especially the adjustment of information and communication technology. By applying AI in education technologies, educators can determine student needs more precisely, keep students more engaged, improve learning, and adapt teaching accordingly to boost learning outcomes (Issayeva, 2023). Artificial intelligence in education offers personalized learning experiences, automates administrative tasks, and provides real-time data analysis.

Forms of Artificial Intelligence

According to Ralph and George (2010) the history of AI can relatively be categorized into three forms.

1. Data-based neural artificial intelligence: this type of AI is largely based on neural system (neurobiology/nervous system). Here the human brain started to look like a computer and the computer became known as the electronic brain.
2. Logic-based artificial intelligence: this form of AI was able to manipulate logical theorems and their creators were certain that they had produced solver that thinks. .
3. Knowledge-based artificial intelligence: this type focuses on the cognitive (intellectual) level of activity.

Roles of AI in Teaching Profession

The role of artificial intelligence in the field of education is numerous. It is included as part of curriculum, as an instructional delivery system and a tool to enhance the entire learning process (Raja and Nagasubramani, 2018; Nwankwo,2014). Technology has radically and positively impacted on education and training globally by transforming teaching and learning. In fact, there is no aspect of human existence and career generally and particularly teaching profession that has not been

impacted tremendously by technology. It is expected that the wide application of artificial intelligence for teaching and learning in teaching profession programmes in Nigerian institutions will likely impact in improving the quality and learning patterns to be more practical and effective. One of the most significant impacts of AI in education is its ability to provide individualized learning paths for students based on their unique needs, learning styles, and abilities (Takyar, 2022). This helps to ensure that students receive the support and resources they need to succeed, regardless of their background or skill level. AI in education helps educators identify gaps in student knowledge and provide targeted feedback to improve learning outcomes.

According to Nwankwo (2022), one of the biggest challenges in education is that everyone learns differently. It is difficult for teachers to accurately grasp each student's real learning situation, leading to the teaching design and teaching process, difficult to focus on each student's real learning needs, resulting in a waste of energy, time and teaching resources. But the artificial intelligence system can provide each learner with a personalized learning style, so that each student can learn in the most suitable way, accurately record the learning status of each student, assist teachers to achieve hierarchical teaching and precise teaching, and effectively solve the core problems of teaching and learning. The presence of AI-based applications provides opportunities to learn anytime and anywhere, not limited by space and time (Fitria, 2021). In addition, students also have the opportunity to find teachers other than the teachers at the school. With this online education platform and the availability of teachers to choose from, students have the opportunity to communicate with other teachers, even with teachers from other countries. The learning experience and abilities of students will certainly be able to develop better. At present, the application of artificial intelligence in the field of our education mainly includes image recognition, speech recognition, human-computer interaction and so on (Deng, Ang & Ning, 2019). Applications of artificial intelligence in the teaching profession mainly focuses on AI-driven e-learning platforms and AI-based assessment tools in teaching and learning.

AI-driven e-learning platforms: By integrating AI, eLearning platforms are evolving into intelligent systems capable of delivering personalized, engaging, and adaptive learning experiences. One of the most significant contributions of AI to eLearning is the ability to provide personalized learning experiences. AI algorithms analyze vast amounts of data on individual learners' behaviours, preferences, and performance. This analysis enables the creation of customized learning paths tailored to each student's unique needs. Personalized learning is an educational approach that

tailors instruction to individual students' needs, abilities, and interests. It involves adapting the content, pace, and style of teaching and learning based on each learner's unique profile. Personalized learning recognizes that one-size-fits-all instruction is often ineffective because learners have diverse backgrounds, prior knowledge, learning styles, and motivations (Katiyar, 2024; Nwankwo,2024). For instance, AI can identify areas where a learner is struggling and adjust the content accordingly, offering additional resources, exercises, or alternative explanations to help them grasp difficult concepts. The use of modern technology to mold students' expectations and "abilities to access, acquire, manipulate, construct, create, and communicate information" in these digital contexts has resulted in students prospering (Green & Donovan, 2018). Personalized learning platforms known as "adaptive learning systems" (ALSs) may be used to create lessons that are personalized to the learning styles and preferences of students as well as the order and level of task difficulty (Pliakos, et al., 2019).

Adaptive learning is another area where AI is making a significant impact. Traditional eLearning platforms often follow a one-size-fits-all approach, which can be inefficient for diverse learners with varying abilities and learning paces. AI-driven adaptive learning technologies dynamically adjust the difficulty and type of content presented to learners based on their ongoing performance and interaction patterns. AI's ability to analyze vast amounts of data is transforming how eLearning platforms gather and utilize insights. By tracking learners' interactions, progress, and performance, AI can generate detailed analytics that help educators and administrators understand the effectiveness of their courses and identify areas for improvement. These data-driven insights enable more informed decision-making and continuous optimization of the learning process. AI is also enhancing learner engagement and interaction through the use of chatbots and virtual assistants. These AI-driven tools can facilitate communication between learners and the eLearning platform, answering queries, providing information, and guiding users through their learning journey. Chatbots can handle routine inquiries, such as course registration or technical issues, allowing human instructors to focus on more complex and value-added tasks. Bordia (2023) concluded that educational institutions can use AI-powered chatbots to provide uninterrupted learning to students. As chatbots are available, students can use them to resolve doubts in real time. Moreover, chatbots can also be used by school authorities to provide information to parents and students.

AI-based assessment tools: Artificial intelligence streamlines the assessment and grading system by analyzing student work and offering swift and consistent evaluations. It lightens educators' burdens, allowing them to concentrate on personalized guidance (Takyar, 2022). Patterns in student performance aid in identifying struggling individuals and directing focused assistance. Meanwhile, AI's efficiency ensures prompt feedback, enhancing the learning cycle. The automated grading and assessment systems optimize teaching quality, promote equitable assessment, and cultivate effective student-teacher collaboration. AI can automate grading processes for assignments, quizzes and exams. By using machine learning algorithms, AI systems can assess and provide feedback on student work, saving time for educators and offering immediate feedback to learners. This enables teachers to focus more on personalised instruction and supports timely feedback for student growth such as suggesting corrections and identifying learners' mistakes (Memarian, 2023).

AI-based systems for assessment include services such as intelligent tutoring systems (ITS), automated scoring tools, computerised adaptive tests, essay scoring systems, chatbots, AI robots, augmented and virtual reality systems, all of which have been developed over a number of years. Teachers can use artificial intelligence (AI) tools to personalise formative assessment, providing real-time individualised feedback that addresses individual learning needs. AI can reduce the subjectivity associated with human grading and reduce the time spent on grading tasks. However, AI-powered tools can automate the process of providing feedback on assignments, quizzes, and exams, saving teachers valuable time while ensuring that students receive timely feedback to improve their performance. Students receive instant feedback on their work, allowing them to identify errors and areas for improvement in real time. This feedback loop boosts learning efficiency and facilitates student progress (Muñoz, et al., 2022). Additionally, natural language processing (NLP) technology enables AI to evaluate written assignments, essays, and even speeches, providing detailed feedback on grammar, style, and content.

Artificial intelligence powered tools and applications improve educational measurement, including testing, assessment, and evaluation. These tools can provide educators with valuable insights into student performance, learning outcomes, and instructional effectiveness. For example, AI-powered assessment tools can analyze student responses to assignments and provide personalized feedback to help students identify areas of strengths and weaknesses (Nazaretsky et al., 2022). These tools can also provide teachers with insights into the

effectiveness of their instruction and identify areas, where they may need to adjust their teaching strategies. In addition, AI-powered tools can help automate many aspects of the assessment process, saving time and reducing the burden on teachers (Huang et al., 2023). AI-powered tools can also help identify students at risk of falling behind or benefit from additional assistance or remediation (Delgado et al., 2020). These tools can analyze students' data, such as test scores and attendance records, and identify patterns that may indicate a need for intervention. This can help teachers to provide targeted support to students who need it most. Therefore, the development of AI-powered tools and applications has revolutionized the field of education by providing educators with valuable insights into student performance, learning outcomes, and instructional effectiveness.

Benefits of Artificial Intelligence to the Teaching Profession in Nigeria

Education is one of the most important sectors in Nigeria that touches everybody regardless of age and location. Many other elements can be obtained through AI according to (Chen et al, 2020). We will briefly examine some potential benefits that AI offers to students and teachers. Artificial intelligence brings benefits and opportunities to education by:

1. Facilitating personalization of learning, providing instant feedback and improving efficiency in the assessment process. One of the key aspects of AI in education is the ability to adapt the learning process to the individual needs of pupils/students.
2. Artificial intelligence helps to reducing the workload of lecturers. In the recent years, the lecturers have often shown dissatisfaction with the high workload experienced in education.
3. Artificial intelligence can be used to create tutorial and interactive virtual assistants, system that can answer students' questions, provides additional explanation and guide students in real-time through the learning process.
4. Through tutorial and virtual assistance students can benefit from additional support and learn at an individualized pace receiving real-time guidance to support learning process (Mahendra 2023).

Challenges of Artificial Intelligence in the Teaching Profession

According to Alabi (2022) the following are some hindrances of AI in teaching profession:

1) **Fear of AI jeopardizing the objectives of education if the emphasis is on technology alone:** If the development of AI is mainly focused on technology, there is a risk that AI applications will no longer be in line with educational objectives. This risk increases when simulations are used excessively for teaching. There is a chance that knowledge and skills in a simulation cannot be applied in the real world.

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2) **Lack of human interaction:** Such gaps can hinder students' personal development, as without human connections, it can be difficult for students to develop emotional and social skills according to (Grace et al. 2018).
3) **Dependency on black-box models versus the responsibility of lecturers:** there is a risk that education will become dependent on AI systems that we do not fully understand. A lecturer cannot take responsibility for systems that are incomprehensible.
4) **Applying AI without preparation:** so many conditions need to be met before Artificial Intelligence can be successful applied in education. For example, technical infrastructure and data are required before AI can be applied.
5) **Insecurity issues:** safety and security regarding AI-based system revolve around concepts such as safe Artificial Intelligence for use by humans, verification, validation, self awareness in adversary prone environment.

Several countries are known for their advancements in artificial intelligence and making them great destinations for learning about these fields.

1. **United States:** The U.S. is a global leader in AI research with top universities like Stanford, MIT and Silicon Valley as a hub for tech innovation.
2. **Japan:** Japan is known for its robotics industry and has a strong focus on AI research. Institutions like the University of Tokyo and the Advanced Telecommunications Research Institute International are renowned for their work in AI.
3. **Germany:** Germany is known for its engineering expertise and has a strong robotics industry in the Technical University of Munich.
4. **United Kingdom:** The UK has a strong presence in AI research, with universities like Oxford and Cambridge at the forefront of AI innovation.

Suggestions for Effective Integration of AI in the Teaching Profession

In order to ensure effective integration of AI in the teaching profession, the following suggestions are made:

1. Educational institutions should keep pace with rapidly evolving technology, to enable teachers and students to be future ready.
2. There would be less interactions between human beings in offices and other places of work as automated machines takeover most of the jobs.
3. Employers who have the intention of using AI in their place of work should retrain their staff to new tasks when the old ones would be taken over by artificial intelligence (automated machines).
4. Both software and hardware components should be made available in the school by the government to aid the use of AI by the Lecturers and learners.
5. There should be personal code for accessing one's data in order to maintain confidentiality.

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Conclusion

The future of artificial intelligence in education is likely to grow in the coming years. With the help of AI technology, educational institutions can make teaching processes more efficient and effective and a range of benefits for students and teachers. With the help of artificial intelligence, teachers can better track students learning and create more personalized teaching plans. Educational institution and teachers must be prepared to use AI and adapt to technological changes.

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