

TECHNOLOGIZING THE EDUCATION SYSTEM: CAN ARTIFICIAL INTELLIGENCE TAKEOVER THE TEACHER'S JOB? A HYPOTHETICAL EXPLANATION

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Abstract: In recent times, technology has played a significant role in education, with artificial intelligence (AI), one of these technological tools, becoming an emerging topic in education. It has been of great concern to professionals and researchers in the fields of science and education. The growing and/or increasing power of this app in society and in the education sector, especially as it affects the teaching profession, or teachers, to be specific, is of great worry and/or a profound risk. Education has been the basis for all progressive nations, and teachers have also been the main part of this progress, as they remain at the helm of major instructional decisions and the management of any of these innovative ideas to improve the teaching-learning process. With advances in technology and constant technological innovations, teachers are constantly refusing to adopt or integrate any of these innovative technologies or ideas in the education system. Artificial intelligence has become one of these innovative ideas, and is currently an emerging topic in the education system in recent years, threatening the foundations of teachers or educators in recent times. This paper focused on the argument that teaching machines will or will not replace human teachers in the classroom. Therefore, the researchers hope to find out from the existing literature if artificial intelligence could, in reality, replace the job of teachers in the classroom or act as an enhancer for teachers in the entire education sector. The paper further discussed the merits of AI in the modern classroom. The need for IT literacy among teachers and students alike in contemporary education structures was also discussed. The paper finally looked into the teachers' challenges against successful implementation of artificial intelligence teaching machines in the education process and made recommendations and suggestions for sequential improvements.

Keywords: Artificial Intelligence, Classroom, Education system, Robot, and Teacher.

Introduction

Advances in technology are an unstoppable move. Sardar (2023) noted that we live in an age that is wholly surrounded by technology. The scholar further revealed that it has played important roles in every facet of life, including in the education sector. Innovative technology, such as computers, artificial intelligence robotics, chatbots, and virtual reality systems, is being used in the present day in every field of society and also in education. It is no longer an exaggeration, but a known fact that technology is replacing almost every known activity in modern times. It has become a point that one of these emerging technologies today that is affecting almost all human endeavour' is artificial intelligence (AI), which tries to simulate human reasoning. Sardar (2023) opined that artificial intelligence is becoming very popular among students, researchers, teachers, corporate workers, etc.

The scholar revealed that there are views that artificial intelligence can replace many professions in the future. There is a growing need for the implementation of artificial intelligence in the field of education. Currently, as put forward by Tsi (n.d.), a broad range of artificial intelligence technologies, from intelligent tutoring systems (ITS).

Offering one-on-one tutoring to virtual teaching assistants, are being employed in education. According to Chan and Tsi, (n.d.), there are fears, as some scholars have already argued that AI is better equipped than human educators to deliver standardized content and assessments, and can work tirelessly without fatigue or bias. Hence, there are predictions that intelligent robots will replace human teachers (Houser, 2017).

Application of AI in education dates back to the 1950s with the introduction of computer-assisted instruction (Chan & Tsi, n.d.). With the current development and launch of ChatGPT (OpenAI, 2023), a generative artificial intelligence software that can generate human-like responses to a wide range of topics, and the increasing capabilities of artificial intelligence technologies, the question of whether or not artificial intelligence will replace the jobs of teachers seems closer to reality. Researchers have anticipation that in the near future, more than five million jobs will be replaced by artificial intelligence (Cerullo, 2023). The question now is: will teachers be among the jobs to be displaced? This answer will be left for the future and for any person's guise.

As may be observed currently, the era of papers and pens is being gradually replaced with computer software. I can write and print with Microsoft word, and even notepads provided by Smartphones. Physical books are gradually giving way to e-books and personal Digital Files (PDFs) (Goel, 2019). Historically, the artificial intelligence application was coined by an American computer scientist, John McCarthy (Kumar, 2019), along with others, namely, Alan Turing, Marvin Minsky, Allen Newell, and Herbert A. Artificial Intelligence, as (Xu, Liu, Cao, Huang, Liu, Qian and Zhang, 2021) revealed is transforming every walks of life, such as medicine, psychology, science and public policy.

It has been acclaimed to be one of the emerging technologies which tries to simulate human reasoning in AI systems (Kumar, 2019). As teachers or educators, just as Louis and Eliazab (2023) put it, the use of technology to improve teaching and learning and to support innovation throughout educational systems is the main goal for all of us. Artificial intelligence driven tools are changing the face of education. Just as Trovato (2023) referred to it as “a game-changer” for education. Its integration into the education system has ushered in current debate in the education arena, especially to the extent to which it can replace or not replace the teachers.

Artificial Intelligence is playing fantastic role in the education sector, and teachers have been gripped with fears of losing their jobs; hence, many professionals/educators have been worried since the invention of this application and the associated activities, particularly in the education arena and thereby raising some pertinent questions, such as:

- i. “Is modern technology good or bad in the education sector?”
- ii. “Can artificial intelligence be equated with human intelligence?”
- iii. “Is artificial intelligence sophisticated enough to replace the teachers in the classroom?”
- iv. “Will technology really replace all human activities?”

Every scholar has a different perception to the above questions; however, these questions will form the basis or the focus of this paper.

Recently, engineers and scientists have been working on how to replace human teachers with human machines, or robotic teachers. Though it has been said that traditional teaching methods make lessons difficult to understand for students because they are formal and boring (Regudon, Yazon, Manaig, Sapin, & Tamban, 2022). Over the

years, arguments have arisen on whether intelligent robots can really take over the jobs of teachers in the classroom. This statement is now of great concern to scholars in information and communication technology (ICT) and the teaching profession in particular. Many have insinuated that, with the rate of technological advancements in contemporary times, it is possible for teaching machines (robots) to assume the position of human teachers in the classroom. This argument cannot be holistically examined without first understanding the job of teachers in the classroom to ascertain how technology (robots or teaching machines) could replace teachers in a modern classroom.

We cannot deny the fact that technology has made a lot of progress in the advancement of the education sector, but this does not really mean that technology will replace the job of teachers in the classroom. As Orhani (2023) put it, despite the advancements in technology, the significance of human teachers in the classroom has not diminished. Also, given the limitations inherent in these emerging technologies, the teachers can never be replaced because it is the teachers that use these technological tools to enhance their teaching work. Teachers use this interactive software to provide customized and relevant information to their students in the classroom. The scholar further stated that while this interactive application can assist teachers, it cannot replace teachers' continuing responsibility to assist students in their growth as learners. This is particularly true, Orhani (2023) asserted.

However, educators and teachers have recognized the power or capabilities of artificial intelligence in the education system, such as speech recognition, to increase support for students with disabilities, multilingual learners, and others. They are exploring how artificial intelligence can enable writing or improve lessons, as well as their process for finding, choosing, and adapting material for use in their lessons (Louis & Elazab, 2023). Therefore, the purpose of this paper is to address the issue of artificial intelligence replacing or not replacing teachers in the modern education system. The paper will also delve into other issues, such as the importance of artificial intelligence, the need for artificial intelligence skills for both teachers and students, etcetera.

Firstly, the paper conceptualizes the terms associated with this subject matter. It x-rayed the role of teachers in the classroom to ascertain the reality of machine teachers taking over the job of human teachers or not. The paper also looked at the merits and demerits of AI within the education industry and beyond to uphold a balance on the issue under investigation.

Definition of terms

However, as we try to examine the authenticity of this statement from existing literature, let us examine the meaning of some important terms that will enable us to easily comprehend the subject matter of this paper.

Robot: This word is derived from the Czechoslovakian word "robota." Mr. Karel Čapek, the Czech interwar writer, introduced this word to the public in his play published in 1920, titled "Rossum's Universal Robots." Robot refers to a machine programmed by a computer that is capable of carrying out a multifaceted or complex series of actions automatically. It may also refer to any automatically operated machine that replaces human effort and performs functions in a human-like manner. A programmed machine that resembles a living creature that replaces human efforts, is capable of moving independently and automatically, lacks normal feelings or emotions, and performs various repetitive, complex actions or tasks (Moravec, 2024, and <https://www.merriam-webster.com/dictionary/robot>).

Teacher: Wikipedia (2024) conceptualized a teacher, school teacher, or educator as a person who helps students acquire knowledge, competence, or virtue via the practice of teaching. A teacher is someone *who teaches*, one whose occupation is to instruct. The person who is responsible for the development efforts of physical and

spiritual learners, both cognitive, affective, and psychomotor, in order to reach a level of maturity so that he is able to fulfill his humanitarian duties... (Chasani, 2022).

Classroom: A classroom refers to a designated room or venue for the process of teaching and learning (i.e., where pupils or students are taught), especially in a school or college setting. Teaching machines are mechanical devices that present educational materials and teach students. Bruillard (2019) conceptualized teaching machines as mechanical, electrical, or other automatic devices that present items of information in a planned sequence, register users' responses to each item, and immediately indicate the acceptability of each response. In a nutshell, the scholar considered it any mechanical device used for presenting a program of instructional material.

Education System: The educational system refers to those structures created by the state to educate the population of that state (Tarasova). It is a pattern of organization of education provision, usually at the country or national level, the most important level where formal education is regulated. Furthermore, education system refers to state education, which consists of programs that include everything aimed at educating the population from kindergarten to high school (<https://www.igi-global.com/dictionary/education-system/56844>). An education system refers to the economic and social factors that typically make up public schools at the federal, state, or community levels. Such factors include public funding, school facilities, staffing, compensation, employee benefits, teaching resources, and more.

Artificial Intelligence

Several definitions have been given to artificial intelligence based on scholars' perceptions and the activities performed by the app. Presently, the description and boundaries of artificial intelligence are contested without a universally accepted single definition (Wayne, Persson, Chounta, Wasson & Dimitrova, 2022). As a result, Splashgain (2023) defined artificial intelligence as the science and engineering of creating machines or systems that can perform tasks that normally require human intelligence, such as reasoning, learning, decision-making, perception, and natural language processing. Kobylinskyi (n.d.) conceptualized artificial intelligence as the science and engineering of creating machines or systems that can perform tasks that normally require human intelligence, such as reasoning, learning, decision-making, perception, and natural language processing.

Duggal (2023) conceptualized it as the simulation of human intelligence in machines that are programmed to think and act like humans. Learning, reasoning, problem-solving, perception, and language comprehension are all examples of cognitive abilities. Artificial intelligence is accomplished by studying the patterns of the human brain and by analyzing the cognitive process (Duggal, 2023). The scholar further sees it as a method of making a computer, a computer-controlled robot, or software think intelligently like the human mind.

Mondal (2020) refers to artificial intelligence as the science and engineering of making intelligent machines that solve different kinds of problems via natural language processing, neural networks, and machine learning. A set of sciences, theories, and techniques whose purpose is to reproduce by machine the cognitive abilities of a human being. Current developments aim, for instance, to be able to entrust a machine with complex tasks previously delegated to a human (Council of Europe, 2021). Artificial intelligence is the ability of a computer program to learn and think like a human being. Everything can be considered artificial intelligence if it involves a program doing something that we would normally think would rely on the intelligence of a human (Kumar, 2019).

According to the Great Learning Team (2023), artificial intelligence is defined as the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings.

Furthermore, AI has also been conceptualized as an intelligent entity created by humans, capable of performing tasks intelligently without being explicitly instructed, as well capable of thinking and acting rationally and

humanely (Great Learning Team, 2023). AI has, according to (Mondal, 2020). Has further been referred to as the science and engineering of making intelligent machines that solve different kinds of problems via natural language processing, neural network and machine learning. Artificial intelligence is the simulation of human intelligence in machines that are programmed to think and act like humans (learning, reasoning, problem-solving, perception, and language comprehension are all examples of cognitive abilities). Artificial Intelligence is a method of making a computer, a computer-controlled robot, or a software think intelligently like the human mind (Duggal, 2023). Baker and Smith (2019) also provided a broad definition of artificial intelligence, as computers, which perform cognitive tasks, usually associated with human minds, particularly learning and problem-solving". Finally, artificial intelligence can be termed as artificial brain of a human being (Sardar, 2023).

Nonetheless, the definition of artificial intelligence cannot be exhausted in this paper, hence, let us examine the need for AI skills for teachers and students and the rest of us all.

Need for Artificial Intelligence Literacy Skills

Research shows that the term "AI literacy" was first coined by Burgsteiner, Kandlhofer & Steinbauer (2016) and Kandlhofer, Steinbauer, Hirschmugl-Gaisch & Huber (2016), whereby they described it as the competencies to understand the basic knowledge and concepts about artificial intelligence. Additionally, Long and Marko (2020) defined artificial intelligence literacy as a set of competencies that enables individuals to critically evaluate, communicate, and collaborate effectively with artificial intelligence.

Considering the complementary role of artificial intelligence in contemporary times, there is a need for both teachers and students to be abreast of the technological tool and be skilled in its usage for the benefit of both teachers and students alike. In addition, Ng, Leung, Chu, and Qipao (2021a, b) emphasized and equally recommended the use of artificial intelligence in every student's twenty-first century digital literacy in work settings and everyday life and proposed it as a fundamental skill for everyone, not just computer scientists. The importance of AI in the education sector has made it imperative for both teachers and students to be abreast of AI skills.

According to Ng et al. (2021a, b), knowing and understanding the basic competencies of artificial intelligence and using artificial intelligence applications is important for all citizens to become artificial intelligence literate in today's digital world. In fact, Yang (2022) stressed that it has become very essential for children to acquire skills in their early years due to the importance attached to them in a digital society like ours. Yang (2022) gave several reasons why young children need to have artificial intelligence skills, including: (1) Children need to be empowered to understand, use, and evaluate artificial intelligence with purposeful guidance (Williams, Park, & Breazeal (2019a); (2) Children should have the capability to understand the basic functions of AI, especially when more well-designed artificial intelligence toys appear in their everyday experience (Kewalramani, Palaiologou, Dardanou Allen, & Phillipson (2021); (3) Su and Yang (2022) further identified artificial intelligence in early childhood education studies that have introduced artificial intelligence concepts to kindergarteners using AI learning tools such as PopBots and Zhorai. Ng et al. (2021a, b) added AI to every student's twenty-first century digital literacy in work settings and everyday life and proposed it as a fundamental skill for everyone, not just for computer scientists.

Role of Teachers in the Classroom

Duggal (2023) has pointed out that machines can easily replicate teachers in the classroom. Let us examine how this statement is justified. Firstly, before jumping to the conclusion that artificial intelligence is replacing or taking over the functions of teachers in the classroom (Trovato, 2023), let us adequately appreciate the invaluable role

of teachers' in our education system. Let us examine the major role teachers play in the lives of children or students in the classroom, compare such functions to those of teaching machines, and take a position on the possibility of a teaching machine taking over the job of teaching from teachers in the 21st century.

Trovato (2023) has in his opinion summarized the role of teachers thus:

“Teachers bring something uniquely human to the classroom. They inspire us, mentor us, guide us, and even counsel us when we need it. They don’t just teach, they adapt to the classroom atmosphere, to individual student’s needs, and to ever-changing situations. And it’s not just about imparting knowledge. Teachers are role models, character builders, and value instillers. They shape the hearts and minds of future generations. Teachers are instrumental in our emotional and social development. They foster a sense of belonging, nurture positive classroom cultures, and impart vital soft skills like collaboration, communication, and empathy. All these aspects of education are profoundly human, and they’re an integral part of the learning process)” p. 3.

The advent of artificial intelligence has made the old geographic boundaries and barriers to become a thing of the past. AI has made education more scalable and accessible. It enables online courses, which is not confined by geography or limited by the number of seats in a classroom or lecture hall (Trovato, 2023).

Tsi (n.d.) has also enumerated some unique teachers' roles in the classroom. Teachers possess both motional bonding and interpersonal skills that are essential for students' personal growth and development. With the teachers' professional skills, they can understand students' sensitivities, sympathize, and encourage students, especially those who are no longer catching up with others. Teachers can understand, empathize, and motivate students in class during lessons. Teachers are psychologically trained to observe students' facial expressions during their classroom business. They have the capabilities or the skills to detect when students are feeling fatigue, that is, when they are unwilling to continue with a particular lesson. They know when the students are not feeling fine or seek medical attention.

Teacher's skills enable them to inspire students to be inquisitive by sharing their own eagerness for learning and fostering a growth mindset; teach them moral and ethical guidance, which often play a role in shaping students' moral and ethical values by discussing complex issues and encouraging reflection.

Furthermore, teachers can take care of or provide personalized support for students with special needs, addressing any unique challenges they may face; they know when students do not attend classes and care to ask why. Teachers can initiate student peer interactions and connections via project-based lessons and field trips. Teachers, in the course of performing their jobs, can interact with families, communities, and schools, which forms the “social milieu” of education where teaching-learning occurs. Teachers do communicate with parents to discuss students' progress, share concerns, and offer guidance, personal touch, and emotional understanding among students and learners.

Teachers help teach students essential life skills, such as time management, goal-setting, and decision-making, during lessons.

Teachers are encouraging open-mindedness by fostering an environment of open-mindedness and encouraging debate by presenting diverse perspectives, asking challenging questions, and facilitating discussions. Yang & Zhang (2019) opined that teachers can provide instructional media to illustrate abstract concepts. Additionally, they improvise instructional media for students where there is none or not enough to meet the objectives of the lesson. Also, teachers act as role models for students, which defines their characters. Teachers display emotional bonding and interpersonal skills that are essential for students' personal growth and development. Teachers help

students imbibe social and emotional learning skills by modeling appropriate behavior, discussing emotions, and helping students develop self-awareness and empathy. It enables students to understand, relate to, or collaborate with others within and outside the school's environment.

Teachers foster creativity and critical thinking in students by designing engaging lessons, asking thought-provoking questions, and encouraging open discussions among students? Teachers personal interactions with students/learners help create positive learning environment like the teachers? In course of performing their duties and avoid cultural clash in the classroom, teachers are usually very sensitive to easily understand every cultural nuances of students and adapt to their teaching approach accordingly to accommodate same in their teaching-learning process.

Merits of Artificial Intelligence in Education

Trovato (2023) described artificial intelligence as a "game-changer for education." The Council of Europe's Committee of Ministers (2019) noted that artificial intelligence is increasingly having an impact on education, bringing opportunities as well as numerous threats. Louis and Elazab (2023) noted that the application of artificial intelligence in the field of education is still in its infancy; hence, people effectively combine the high efficiency of machines with human intelligence to influence the development of society.

In field education, these intelligent machines as observed by systems (Liang, Hwang, Chen, & Darmawansah, 2021; Mousavinasab, Zarifsanaiy, Kalhori, Rakhshan, Keikha & Ghazi Saedi, 2021; Su, Zhong, & Ng, 2022; Zawacki-Richter et al., 2019; and Zheng et al., 2021) can help teachers predict students' learning status and performance, recommend learning resources, and automate assessments to improve students' learning experience via intelligent agent systems, Chabot, and recommendation technology in education.

Teachers and educators, no doubt, have recognized the great importance of artificial intelligence in the education system. As Louis and Elazab (2023) revealed, amongst them are voice assistants in their homes, tools that can correct grammar, complete sentences, and write essays; as the scholars further stated, others are speech recognition to increase the support available to students with disabilities, multilingual learners, and greater adaptiveness and personalization in digital tools for learning. They are exploring how AI can enable writing or improving lessons, as well as their process for finding, choosing, and adapting material for use in their lessons (Louis and Elazab, 2023).

Teachers now use artificial intelligence-powered services in various activities, both at home and in teaching and learning processes. They also use AI-powered voice assistants in their homes, artificial intelligence tools that can correct grammar, complete sentences, and write essays, and automated trip planning on their phones in speech recognition to increase the support available to students with disabilities, multilingual learners, and others who could benefit from greater adaptivity and personalization in digital tools for learning. They are also exploring how AI can enable writing or improving lessons, as well as their process for finding, choosing, and adapting material for use in their lessons (Louis and Elazab, 2023).

Furthermore, many other scholars, such as Liang, Hwang, Chen, & Darmawansah (2021); Mousavinasab, Zarifsanaiy, Kalhori, Rakhshan, Keikha & Ghazi Saedi (2021); Su, Zhong & (2022); Zawacki-Richter, Marín, Bond & Gouverneur, 2019; and Zheng, Niu, Zhong & Gyasi 2021, have recognized and affirmed that artificial intelligence can help teachers to predict students' learning status and performance. In addition, Su, Ng and Chu (2023) revealed that artificially intelligent products, such as chatbots and recommendation tools, are used to facilitate children's everyday lives and studies.

Su, et al (2023) have as well revealed that AI applications facilitate students in computer-supported collaborative learning, teaching automation and evaluation, detecting learners' emotions, and recommend useful materials for students. Lin, Brummelen, Lukin, Williams & Breazeal (2020) interacted with a dialogue system and affirmed that AI enable students to interact with the Chatbots to enhance language learning and visualization training. Again, Nan (2020) also used an AI teaching system to motivate students' learning in a collaborative AI-assisted environment and stimulate children's interest in learning. AI frees teachers from heavy homework corrections. And effectively promote the improvement of teaching efficiency Louis & Elazab (2023).

Louis & Elazab (2023) have observed that, as humans, teachers are bound to make mistakes from time to time, but maintained that artificial intelligence reduces human errors, and computers, if they are properly programmed, have the possibility of reaching accuracy with a greater degree of precision. Trovato (2023) claimed that ChatGBP is one of the quickest-adopted applications ever, especially in education, where it helps students with assignments and other academic issues.

Scholars have revealed that one of the biggest advantages of artificial intelligence is risk taking. Artificial intelligence can overcome many of the risky limitations of humans through the use of robots, which perform risky tasks. For instance, an artificial intelligence robot can go to Mars, defuse bombs, explore the deepest parts of oceans, mine for coal and oil, and be used effectively in any kind of natural or man-made disaster (Louis & Elaza, 2023).

Artificial intelligence machines work tirelessly, hence can work 24 hours per week unlike human beings that can only work between 6 and 8 hours per day. This becomes necessary because humans are built in such a way that they will take some time out to refresh themselves and get ready for another day's work. Sometime, they take weekly breaks to stay intact with their work-life and personal lives.

Although the intelligent tutor system is still undeveloped at this stage, the education sector has noticed great improvement in recent times with the use of the Smart Tutor System, which is one of the adaptive learning systems. The emergence of the Smart Tutor System has improved the one-way instructional mode of teachers to students observed under the traditional teaching method, which has, to a large extent, obtained better teaching results than ever before. Louis & Elazab (2023) stressed that the system can make targeted learning plans according to different students' mastery of learning content, and at the same time highlight students' personalized learning methods, and help students master knowledge points more quickly through richer learning resources to realize specific learning goals. The scholar further stressed that the intelligent tutor system, makes it possible to analyze the expressions of the students and understand the learning status of the students from it. Also, the feedback mechanism provided by the system makes the teacher to be more aware of the students' mastery of the classroom teaching content, and use an emotional perception to predict and adjust it.

Again, using cognitive automation artificial intelligence helps in repetitive tasks, as many jobs could be automated, thereby removes "boring" tasks for humans. Digital Assistance is yet another advantage credited to artificial intelligence. It is not an exaggeration to say that artificial intelligence has the potential to reinforce positive transformation in education. For instance, AI-powered computer vision and voice-to-text applications can significantly boost school accessibility for learners with visual and hearing impairments (Bertrand (2023).

One of the arguments put forward by scholars in favour of artificial intelligence is that every student learns differently, and this task cannot be effectively tackled by teachers because it is difficult to focus on each student's real learning needs, which results in a waste of energy, time, and teaching resources. However, they agree that an 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 in achieving hierarchical and precise teaching, and effectively solve the core problems of teaching and learning. In total, personalized learning means that each student's learning experience is tailored to fit their needs. Personalized learning lets each person's wants and learning goals be met by changing things like the speed at which they learn, the materials they use, the quality of the materials, the order in which they learn them, the technologies they use, the way they are taught, and the materials they use to learn (Meehirr, 2023).

According to Louis and Elazab (2023), in the traditional education model, teachers' work content focuses on two aspects: classroom teaching and correcting homework. In this case, they affirmed that teachers spend more time and energy correcting students' homework. But driven by big data technology, text recognition technology, and semantic analysis technology, automatic correction of homework has been realized in reality. Intelligent evaluation can simplify the correction process to a large extent, according to Louis and Elazab (2023). The application of artificial intelligence makes it faster, more efficient, and very accurate. As Louis and Elazab (2023) put it, it frees teachers from heavy homework corrections, reduces energy in classroom teaching, and effectively promotes improvement in teaching efficiency.

Sardar (2023) concluded that artificial intelligence has an impact on higher education through personalized learning. AI-powered algorithms could analyze student data and provide customized learning experiences based on each student's needs and abilities. It could also help students learn at their own pace, improve their abilities to understand, and automate certain administrative tasks, such as grading exams and papers.

There is no denying that technology has always played a significant role in the progress of human development. Artificial intelligence could predict weather, how to avoid accidents, diagnose diseases, and give the best advice on how to reach our goals. In education, according to Sardar (2023), artificial intelligence at all times delivers what is based on wisdom, knowledge, and efficiency to each student and teacher; it can analyze students' learning patterns and help students by providing feedback and guidance that can lead to improved learning outcomes; generative artificial intelligence can solve instant questions by providing their creative technique and knowledge. It can reset the mode of learning and time, giving students better and more comprehensive support in their studies or projects.

Presently, students have used artificial intelligence applications more to enhance their studies. For instance, we are currently aware of chat-GPT; they get more help from chat boat tutors. Artificial intelligence makes it easy for students who are separated by distance to communicate with each other easily and enjoy the same program. Virtual reality has made learning more accessible than sitting in front of computer screens (Sardar, 2023). Malik, Tayal and Vij (2019) and Chen, Chen and Lin (2020) opined that these new technologies of learning (especially artificial intelligence) can enhance student engagement by providing interactive, personalized, and immersive learning environments. This assertion was supported by a study carried out by Blikstein (2016), whereby he found out that artificial intelligence-supported classrooms yielded higher engagement levels and greater student achievement compared to traditional classrooms.

Chan & Tsi (n.d.) have agreed that the wide array of functions capable of being performed by artificial intelligence can take over some of the functions teachers perform. They opined that teachers usually allocate a certain amount of time to handling administrative tasks, such as attendance checking, assignment and classroom monitoring, and paperwork. But with the introduction of artificial intelligence in the field of education, that artificial intelligence will not only relieve teachers of these tasks but will also be accomplished in a much more efficient way.

In the same manner, Chen, Chen & Lin, 2020; Felix, 2020; UNESCO, 2021) publicized that several studies and reports have provided evidence to support the idea that the time-consuming administrative tasks involved in the teaching and learning process can be done through artificial intelligence technologies while not compromising the task quality; specifically, McKinsey & Company, 2020) pointed out that the survey shows that teachers spend as much as 15% of their time on such tasks. Popenici & Kerr (2017) are also of the opinion that using artificial intelligence technologies to perform teachers' functions can save them more time and give the teachers the opportunity to focus on addressing students' learning needs. AI has the capability to assist teachers in student assessment, as developments in natural language processing facilitate applications such as plagiarism detection, assessment scoring, and automated feedback provision (Chen, Chen, & Lin, 2020; Goksel and Bozkurt, 2019). And in view of the versatility of artificial intelligence activities, Prof. Luckin from the UCL Knowledge Lab predicted that every teacher could have a dedicated AI assistant by 2030.

Furthermore, more benefits of artificial intelligence have been advanced by scholars, noting in addition that artificial intelligence technologies can perform the following tasks, such as:

providing more objective and efficient feedback compared to human teachers (Celik, Dindar, Muukkonen & Järvelä, 2022; Terzopoulos & Satratzemi, 2019).

1. Assist in tracking the learning progress of a group of students by ensuring more effective monitoring of students' learning progress.
2. Tracks and records each student's learning journey and enables teachers' to gain a better understanding of their students and intervene when needed (Celik, Dindar, Muukkonen & Järvelä, 2022).
3. Assists university staff and teaching assistants primarily responsible for administrative duty.
4. According to Pokrivcakova (2019), it fosters a student-centered approach and increases learner autonomy by allowing students to monitor their own learning pace through artificial intelligence supported systems.

Finally, from the available literature, there is no denying that artificial intelligence is progressively making impacts in the education sector, and the future has more to tell about this wonderful teaching-machine software in the educational arena.

Teachers' Challenges for a Successful Implementation of Artificial Intelligence

The Nigerian education system needs ultimate transformation; hence, adequate training is needed to address the new skills and competences required for her citizens to remain relevant in contemporary times to overcome the current economic catastrophe and grasp the new envisaged opportunities that the future holds. Education has a very significant role to play in meeting the present economic, demographic, social, environmental, and technological challenges facing Nigeria as a nation. Therefore, Nigeria should envisage an education system and training policies that can adequately address competences that will be relevant today and in the future society we envisage.

An innovative idea has been introduced in the education sector, and that is the introduction of artificial intelligence in the field of education as in other segments of the society. Effective use of Artificial Intelligence in the classroom demands technological literacy of both the teachers' and the students' alike. Consequently, both the teachers' and the learners need to be adequately trained on the use of new technological devices for effective utilization of artificial intelligence programs for education purposes. In a country like Nigeria, where things don't normally go straightforward, especially when it concerns the education sector, what will be the faith of the teachers with respect to technology literacy to face the new challenges the teaching machines will bring into the classroom?

Nonetheless, let's discuss some of the challenges the teachers may likely face in Nigeria when artificial intelligence will be fully operational in the education sector. As Oriji (2016) posits that in Nigeria for instance, research has it that many digital immigrant teachers are usually resistant or unwilling to change the pedagogy, which they think has been working for them from time past. They usually feel that the old ways of doing things are better than the modern type. Hence, they are resistant to any innovative ideas.

Key challenges for future learning as proposed by Punie & Ala-Mutka (2007) are both the need for new digital skills and the provision of new ways for learning and maintaining them. There is no doubt that future learning/education requires a great deal of the use of Information and Communication Technology-enabled learning digital tools, competence, and higher-order skills from all participants involved in the learning process (Punie & Ala-Mutka, 2007), which will enable the efficient, critical and innovative application.

As innovation creates both advantages and disadvantages in any given situation, with contemporary Nigerian society, where lots of challenges are constantly escalating due to underdevelopment, the successful application of artificial intelligence will not be an easy task. Mostly, the teachers that will teach these generation learners need to be adequately trained, orientation, seminars and workshops regularly organized for them to meet the up with the present realities.

Pitfalls of Artificial Intelligence Use in Education

Technology is currently playing vital roles in the education arena, with automation of most education programmes gradually becoming more common in schools, with educational software catering to some specific requirements of educators, such as curriculum development, grade evaluation, and content recommendation (Orhani, 2023). With the speed of the intrusion of technology in classroom settings and the achievements so far observed, Bertrand (2023) warned that technology also has a high potential for harm and emphasized that generative artificial intelligence could help students cheat in exams.

Certainly, the integration of artificial intelligence in the field of education has brought some visible advantages. It is also important to know that artificial intelligence has limitations that raise doubts about the feasibility of replacing human teachers in the near future. Felix, 2020; Pavlik, 2023). revealed that artificial intelligence presently lacks self-awareness, thereby generating only mechanical responses without emotions. Emphasizing the limitations of artificial intelligence, Timms (2016) stressed that emotional backing from teachers is crucial for student engagement and motivation, which are yet to be automated by artificial intelligence technologies (Schiff, 2020). Felix (2020) affirmed that humans still outperform AI in social and emotional aspects and also emphasized that values and social norms cannot be measured and reduced to algorithms.

Bertrand (2023) likewise observed that artificial intelligence chatbots often throw up results that are sexist, racist, and factually incorrect. Additionally, one of the disadvantages of AI is that teaching machines have a universal character, which is obeying a program; hence, they are slaves to programs—say what I say and do what I do. On this note, it means that teaching machines have no initiative or creativity. Again, learning AI can be challenging, especially for beginners who may not have a strong background in mathematics, programming, or data science (Kobylynskiy, n.d.). Once more, unlike teachers, artificial intelligence lacks the empathy and emotional intelligence necessary for effective teaching and learning (Chan & Tsi, n.d.).

One of the limitations of artificial intelligence, as put forward by Schiff (2020), is that a teacher must know his students in order to know the appropriate instructional method to deliver effective guidance and facilitation for the students. Additionally, Wogu, Misra, Olu-Owolabi, Assibong, & Udoh (2018) have identified yet another. The scholars opined that reliance on artificial intelligence and online platforms may limit peer interactions and

hinder the development of essential social skills, which are usually present in teacher-to-student or face-to-face interactions.

As Cope, Kalantzis & Sears (2021); Felix (2020); Kim, Lee & Cho (2022) noted, notwithstanding the capabilities of artificial intelligence, scholars see it as “cognitive prostheses” that can aid teaching and learning but are not yet capable of replacing the values of human thoughts or collaborative relationships between teachers and students. In the same manner, Zawacki-Richter, Marín, Bond and Gouverneur have as well raised the fundamental and philosophical question of whether machines will be able to actually think or even develop consciousness in the future, rather than just simulating thinking and showing rational behaviour. The scholars believe that it is unlikely that such strong or general artificial intelligence will exist in the near future.

By the way, let us reason together by asking these few undermentioned questions:

1. Can artificial intelligence observe students’ facial expressions during instructions?
2. Can artificial intelligence observe when students are feeling fatigued during instruction?
3. Can artificial intelligence observe when students are sleeping during instruction?
4. Can artificial intelligence wake up students when they are sleeping during instruction?
5. Can artificial intelligence know when a student has slumped in the classroom during instruction?
6. Can artificial intelligence know when students are not ready to continue with the lesson?
7. Can artificial intelligence know when a student or students’ want to take an excuse during a class session to do one thing or another?
8. Can a student complain to an artificial intelligence robot that he is seeking and needs medical attention during instruction?
9. Can artificial intelligence know when a student has not come for a lesson and ask why?
10. Let me borrow the words of Yang & Zhang (2019), Can teaching machines provide teacher-student relationships, peer interactions, and connections between students, families, communities, and schools that form the “social milieu” of education?
11. Can teaching machines provide improvised instructional media for students like teachers?
12. Are the intelligent tools not controlled by human beings, who may probably be the teachers?
13. Are teachers not playing role models for their students? Can artificial intelligence act as a role model for any student?

Tsi (n.d.) has guided me to also raise these under-listed fundamental questions, thus:

1. Can intelligent machines observe the cultural sensitivity that is common among teachers?
2. Can intelligent machines provide real-world examples (especially localized ones) and experiences that help students better understand and relate to the material being taught, like teachers?
3. Can artificial intelligence maintain the emotional bond and interpersonal skills that teachers have that are essential for students’ personal growth and development?
4. Can teaching machines foster creativity and critical thinking in students by designing engaging lessons, asking thought-provoking questions, and encouraging open discussions?
5. Can intelligent teaching machines understand and navigate the cultural nuances of the students and adapt to their teaching approach accordingly?
6. Can teaching machines encourage curiosity by inspiring students to be curious by sharing their own enthusiasm for learning and fostering a growth mindset?

7. Can intelligent teaching initiate parent-teacher communication? Can intelligent teaching machines communicate with parents to discuss students' progress and failures, share concerns, offer guidance, and provide the personal touch and emotional understanding that teachers bring that are very critical for effective parent-teacher communication?
8. Can artificial intelligence help students develop flexibility and determination by offering support, guidance, and encouragement in the face of challenges during lessons?
9. Can artificial intelligence encourage debate and open-mindedness by fostering an environment of open-mindedness and by presenting diverse perspectives, asking challenging questions, and facilitating discussions like the teachers?
10. Can intelligent tools build trust and rapport with students through personal interactions, which helps create a positive learning environment for teachers?
11. Can artificial intelligence support students' social and emotional learning by modeling appropriate behavior, discussing emotions, and helping students develop self-awareness and empathy?
12. Can artificial intelligence apply more than one teaching method or adjust teaching methods and strategies based on the specific needs and learning styles of students during instruction to accomplish a specific task?
13. Can artificial intelligence mediate conflicts between students and teach them essential conflict resolution skills as teachers do?
14. What is experiential learning? Can intelligent teaching machines design and facilitate hands-on experiential learning opportunities for students, such as field trips, lab work, or other interactive experiences?
15. Can intelligent teaching machines teach physical and artistic education that plays a crucial role in promoting physical fitness and coaching sports teams among learners?
16. Can intelligent teaching machines help teach moral and ethical guidance, which often play a role in shaping students' moral and ethical values by discussing complex issues and encouraging reflection?
17. Can intelligent teaching machines help and engage students in collaborative and teamwork activities that help students develop collaboration and teamwork skills through group projects, discussions, and other cooperative activities during instruction?
18. Can intelligent teaching machines help teach students' life skills that often help students develop essential life skills, such as time management, goal-setting, and decision-making during lessons?
19. Can intelligent teaching machines provide support for students with special needs by providing personalized support to students with special needs, accommodating their learning styles, and addressing any unique challenges they may face?

The aforementioned unanswered questions stand as major limitations of artificial intelligence for now, which the teachers have performed effectively to date

Can Technology Really Replace Teachers in the Classroom?

Scholars have argued that with the advances in technology and innovations currently observed, strong systems of artificial intelligence that possess human-level intelligence or even surpass human intelligence across a wide range of tasks can take the jobs of teachers in the classroom. As asserted by these researchers or scholars, strong artificial intelligence would be capable of understanding, reasoning, learning, and applying knowledge to solve complex problems in a manner similar to human cognition (Duggal, 2023). Some scholars have maintained that the involvement of robots in the education process has become an essential issue, which raises various predictions.

For instance, Anthony Seldon, the vice chancellor of the University of Buckingham, predicts that by 2027, robots will replace teachers.

Nonetheless, Louis and Elazab (2023) argued that teachers, as the main part of the educational system, remain at the helm of major instructional decisions; formative assessments involve teachers' input, identifying patterns, making predictions, or analyzing alternative decisions. Most times, artificial intelligence, as a programmed machine, cannot make alternative decisions or predict what will happen in the future.

In continuation of the argument that artificial intelligence is replacing human teachers, Splashgain (2023) and Kobylinskyi (n.d.) maintained that artificial intelligence can only augment or enhance human capabilities rather than replace them. Additionally, Matthew Longtin, a qualified writer for ProPapers, disagrees. He affirmed that since robots lack a soul and cannot inspire students the way people (teachers) can, technology cannot replace human support and encouragement. In a strong argument against technology replacing teachers, Sayeed (2020) stated that robots might be crucial to children's education but will never fully replace teachers. In strong support for technology not replacing teachers, Kobylinskyi (n.d.) reminded us that artificial intelligence is a journey and not a destination.

Artificial intelligence is based on predetermined lessons, which is not the case with human teachers, who can take decisions at any time based on the circumstances. Duggal (2023) has already noted that weak artificial intelligence robots that are designed to perform specific tasks and are limited to those tasks only cannot think of replacing teachers in the classroom because they lack general intelligence like human teachers. Again, Duggal (2023), in agreement with other scholars, affirmed that the development of strong artificial intelligence is still largely theoretical and has not been achieved to date. According to Bertrand (2023), when Bard, Google's conversational chatbot, was asked whether artificial intelligence would really replace teachers, the scholar said that it is unlikely that artificial intelligence will completely replace teachers in the near future." Orhani (2023) has similarly expressed doubt about artificial intelligence replacing teachers in the classroom. Though he is of the opinion that the use of robots in educating students can be crucial, it remains uncertain whether artificial intelligence will entirely replace teachers.

A robot is a moron; a robot must follow human commands (Orhani, 2023). At the moment, artificial intelligence still lags behind humans in most disciplines, especially complex tasks that require a blend of technical competencies and socio-emotional skills (Bertrand, 2023). In fact, many experts agree that in the near future, artificial intelligence will mostly complement rather than replace humans. Evidence is numerous that artificial intelligence can never replace teachers. For instance, Sardar (2023), in conclusion to his research work titled "Can Human Teachers Be Replaced or Retained in the AI Age? An Overview" acknowledged that science and technology have played a great role in the 21st century and that people can have a vision that artificial intelligence could be a threat to traditional teaching methods, but he emphasized that it cannot be a reality in this world. Yes, he recognized that technology presents exciting and enhancing facilities to both teachers and students when they are used in the field of education, but he informed us that technology should not be taken as a substitute for human as well as teaching but can be a valuable instrument in their toolbox".

Additionally, Sardar (2023) further acknowledged that, though there are a lot of advantages to using artificial intelligence, it has limitations. He argued that teachers can understand, motivate, and empathize with students in a way that is not possible with artificial intelligence. Although artificial intelligence could have an impact on higher education through personalized learning, its powered algorithms could analyze student data, provide customized learning experiences based on each student's needs and abilities, help students learn at their own pace,

improve their abilities of understanding, and be used to automate certain administrative tasks, such as grading exams and papers.

Of all these laudable merits credited to it, Sardar (2023) opined that it is unlikely that artificial intelligence will replace teachers entirely because it engages much more than simply presenting information and knowledge to students. He further stressed that teachers play an important role in guiding students through complex concepts, answering questions, providing feedback, and providing mentorship and support that may appear very difficult for artificial intelligence to perform. He again asserts that artificial intelligence systems still have limitations and are not yet capable of replicating the human-like intelligence, creativity, and empathy that teachers possess. In fact, a teacher's ability to adapt to different learning styles and connect with students on a personal level will likely become more valuable as AI technology advances.

In general, Sardar (2023) avowed that while artificial intelligence has the potential to revolutionize higher education in many ways, it is very doubtful that it will replace teachers completely. Instead, the scholar argued that it is more likely that artificial intelligence and teachers will work together to provide the most effective and personalized education to students in the 21st century. Still emphasizing that artificial intelligence will never replace teachers, he stated thus: "Teachers build trust and moral support with students and help them to acquire social and emotional learning. With their interaction with students, their behaviours and empathetic attitude are essential for a learner to build a moral character. Here, artificial intelligence fails to teach." Sardar (2023) further stated that as humans, we can feel humans better, and teachers who have a great responsibility to build a nation feel the nerves of students better than machines.

Teachers can adjust methods of teaching and planning to execute properly according to different situations where artificial intelligence struggles. Inspiration and motivation are essential to reaching a goal perfectly; hence, the personalities of teachers have a great impact on students, as they serve as role models for their students and learners. Teachers can inspire, motivate a passion for learning, make students realize the importance of handwork's characteristics and parts of good learning, and help them become good human beings. Additionally, Jarrahi (2018) emphasizes the irreplaceable role of human teachers in artificial intelligence because, presently, artificial intelligence and students' interactions fall short of the educational value provided by real-life human interactions, which teachers are known.

There is no way that artificial intelligence will replace the teacher; after all, artificial intelligence has been made by humans, and it cannot be greater than the creator. In the field of education, the teacher is still very paramount, as artificial intelligence depends on the teacher for appropriate information to feed the students. In line with Sardar's (2023) reasoning, Kobylinskyi (n.d.) concurs that artificial intelligence can be seen as a way of augmenting or enhancing human capabilities rather than replacing them. Popenici & Kerr (2017) have established that the value of artificial intelligence in its present state of development lies in augmenting teachers rather than replacing them completely.

Conclusion

Wayne, Persson, Chounta, Wasson & Dimitrova (2022) observed and warned that there are some advantages and disadvantages inherent in very new inventions or breakthroughs, but we, as humans, need to take care of that and use the positive sides of the invention to create a better world. Artificial intelligence has come with its positive and negative tendencies in almost all spheres of human endeavor. Nonetheless, there is no way artificial intelligence will take over the functions of teachers because it is the teacher who will provide the resources or the ideas that will be programmed in the machine. It is the teacher that will provide the questions to be programmed,

and it is the teacher that will also provide the answers to the questions. It is important to note that teachers are the subject experts that will provide the necessary information for the computer scientists, mechanical, electrical, and electronic engineers that will program whatever they want to program in any subject area concerning artificial intelligence. The computer scientist or the engineer cannot be a lawyer, a medical practitioner, a historian, an educator, a political scientist, or any other subject. The engineers and the computer scientists must need the subject experts that will give them the necessary information on a given subject area. By the way, who are the subject experts? Are they not the teachers? The teachers are indispensable in any artificial intelligence program, because if the teachers refuse to give out their professional ideas or advice, the programmer will have nothing to programme.

Recommendations

Going by the speed of technological advancements in recent times, the teachers/educators and education stakeholders will have to think fast to make effective use of artificial intelligence tools for the advancement of the education system. As Bertrand (2023) put it, this requires reviewing curricula, syllabi, and teacher professional development programmes, and incorporating objectives and content on artificial intelligence literacy, risks, ethics, and skills, among other things. Bertrand (2023) has also warned that there is no denying that about 40% of the world's population is under 24 years of age, and if schools fail to prepare this generation of youth for the age of thinking machines, then the consequences on social and economic peace may be very severe. There is no denying that this is an era of technology-driven job disruption. We have also seen how intelligent robot investment drives economic growth and creates new jobs across each economy. Hence, policymakers must anticipate the mix of forces this level of automation will unleash—including job creation as well as job displacement across the economy (Cooper, 2019). The new world needs new skills to fit into the economic challenges; hence, policymakers should be able to highlight the new skills the economy now demands and illustrate how the skills deficit might be best addressed. The government at all levels of the education system, the education stakeholders, policymakers, and administrators should, as a matter of urgency, try to see how our classes will be preparing students for the technology and artificial intelligence-driven education of the future (Bertrand, 2023). Mostly, the teachers that will teach these generation learners need to be adequately trained. Therefore, orientations, seminars, and workshops should, as a matter of urgency, be regularly organized for them to meet up with the present realities before it is too late.

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