**International Journal of Advanced Scientific Research**
**ISSN: 2456-0421; Impact Factor: RJIF 5.32**
**Received: 07-09-2019; Accepted: 10-10-2019**
**www.allscientificjournal.com**
**Volume 4; Issue 6; November 2019; Page No. 27-32**

# Education and intelligent machines: Examining the relevance of artificial intelligence in teaching and learning in the 21st century

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**Abstract**
As advances in technology continue to evolve, new methods of accomplishing tasks emerge. Artificial intelligence is a branch of the field of computer and information science that focuses on developing thinking machines that mimic human intelligence that solve problems as if accomplished by humans. These tools, sometimes working under the guidance of a human and sometimes without external guidance, are able to solve or help solve a steadily increasing range of problems. Since its emergence, it has produced a number of results that are important to students, teachers, our overall educational system, and to our society at large (Moursund, 2006). Consequently, the purpose of this article is to examine the concept of this new technological device in the present dispensation. The authors examined the historical development of this field of study, and its relevance in the education sector. The authors also looked at the future of the shortcomings inherent in it and the future of these intelligent machines tool in teaching-learning as the society advances.

**Keywords:** computer robots, education, artificial intelligence, human machines, machine learning, and intelligent machines

## Introduction

The world is continually changing; as it evolves, new knowledge is constantly created and a number of technologies are emerging in importance (Newby, Stepich, leman and Russell, 2006) [22], even at a pace with which we can barely keep up, and the new knowledge and technologies persistently influence every aspect of the work we do. Newby *et al* (2006) further stressed that many of these technologies are not yet developed, and further declared that the nature of these technologies suggest that they could become increasingly important in teaching and learning.

Baker (2019) [3] affirmed that the digitization of processes has affected all professions; we all need to continue learning to keep up with our fields. In concord with Newby *et al* (2006), Knowles (1986) provided a prophetic vision of the future use of technology in the education process; the scholar foresaw a picture of what lies ahead. The author posits, "By the end of this century, most educational services will be delivered electronically by teleconferencing, cable and satellite television, computer networks and other means not yet to be discovered – provided educators learn how to use the media in congruence with principles of adult learning." (P.4). In the same development, Merriam and Cunningham (1989) [15] also declared that the degree to which desirable and the undesirable effects of the new technologies will be felt is dependent upon our ability to accept the challenges of their integration into the continuing education process.

Theses scholars predicted the effects to which technological innovations will play in teaching and learning, to which Artificial Intelligence is currently making waves. For thousands of years, human beings have tried to comprehend how a mere handful of matter can think, perceive, understand, predict, and manipulate a world far larger and more complicated than itself (Russell and Norvig, 2010) [22].

There is no doubt that big companies or organizations today are adopting advanced technologies to improve their productions and other technical and administrative processes. Machines are designed and used in wide areas of human activities or services to simplify their operations.

The theory and development of computer systems enabled computers to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages (https://www.google.com/search?Source=hp&ei=qcN2XGqnt5gLa47X4Aw&q=meaning+of+Artificial+intelligence&btnK=Google+Find).

However, when we talk of something being artificial, we are normally discussing something that is fake, non-natural or not original. Great philosophers have for years imagined how human minds work. Some have as well reasoned if it is possible for non-humans to have minds. Can machines think like human beings? Can non-humans have a mind? Is there intelligence without life? (Negnevitsky, 2005) [18]. The two imaginative thoughts are yet to be fully addressed.

Nonetheless, the answer to the above depends on the angle one looks at it. A number of computer scientists have tried to use the computational approach to address the issues raised above by these scholars, arguing that machines can do everything that humans can do. In the same development, the same idea has been unambiguously opposed by others scholars, claiming that such highly sophisticated behaviour as love, creative discovery and the moral choice will always be beyond the scope of any machine (Negnevitsky, 2005) [18].

In view of this, renowned engineers and scientists have made it possible for machines to have "Intelligence" by building machines that can reason or think intelligently like humans. This is the case with artificial intelligence; a machine developed with the capacity to think like humans, to feel and take decisions on their own. Artificial

intelligence is possible and can be implemented with computers. It essentially implies that intelligence can be reduced to mechanical devices (Raynor, 1999) [19]. There is no doubt that a humanoid robot that can exhibit humanoid intelligence has been developed and/or built. Presently, a vaguely human-like robot that has a trunk, an arm, a head, eyes, ears and fingers are in development (Raynor, 1999) [19].

Hence, the application of AI is now found in almost every field of life, whether it is related to computers, sports, smartphones, games, medicine, education sector, etc., you will definitely find it. The machine intelligence or the intelligence exhibited by machines and Software is here with us and will continue to be improved upon as society develops.

In essence, intelligence requires thinking; it will be worthwhile to examine the two words, "thinking" and "Intelligence" as the two will be vital to this discussion and for a better comprehension of the subject matter – Artificial Intelligence.

What is thinking?

Essential English Dictionary (1990) defined thinking as the activity of using your brain to consider a problem or to create an idea. While the Dictionary of Contemporary English (2009) defined it as, "Your opinion or ideas about something, or your attitude towards it." (P.1836). So, in order to think, someone or something has to have a brain, or an organ that enables someone or something to learn and understand things, solve problems, and also make decisions (Negnevitsky, 2005) [18].

What is Intelligence?

Many scholars have offered various definitions of "Intelligence." The word, however, means the ability to accomplish complex goals (Tegmark, 2017) [29]. Dictionary of Contemporary English (2009) has also defined it as the ability to learn, understand, and think about things. The word intelligence was further defined as 'the ability to learn and understand, to solve problems and as well to make decisions' (Negnevitsky, 2005) [18]. Therefore, intelligence possesses the qualities of thinking, learning and understanding things.

Artificial Intelligence, also known as "Machine intelligence" (Moursund, 2006) [17] or "Expert Systems" (Stair, 1986) [27], is one of the most interesting applications of the computer in recent times. An expert system, however, is a computer system (advanced hardware and software) that has the ability to make judgments and decisions like an expert in a particular field (Stair, 1986) [27]. Artificial Intelligence is a branch of the field of computer and information science (Moursund, 2006) [17]. It is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings (Copeland, 2019) [6]. Essential English Dictionary (2009) as well defined AI as the ability to think and understand something instead of doing things by instinct or automatically. McCarthy (1958) [14] in Selvamanikkam (2018) [24] referred to it as "The science and engineering of making intelligent machines, especially intelligent computer programs".

The Dictionary of Contemporary English (2009) defined Artificial Intelligence as the study of how to make computers do intelligent things that people can do, such as thinking and making decisions. It means the ability to mimic (imitate) human thinking processes with a computer (Straubhaar and LaRose, 1995). Raynor (1999) [19] generally defined artificial intelligence as the field concerned with developing techniques to allow computers to act in a manner that seems like an intelligent organism, such as a human would. The scholar further asserts that artificial intelligence is an area of computer science that emphasizes the creation of intelligent machines that work and reacts like those of humans; they are machines designed and programmed in such a way that they think and act like humans.

In the same development, Copeland (2019) [6] conceptualized Artificial intelligence as the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. Newby, *et al* (2006) described AI as "a branch of computer science concerned with the design of computers and software that are capable of responding in ways that mimic human thinking. Again, the scholar further defined Artificial Intelligence as the ability of a computer system to display behaviour that appears to originate from an intelligent individual or group of individuals.

Truly, computers are not experts and they do not have real intelligence like humans, but due to the advanced, complex and sophisticated ways they were designed and programmed, they now possess the characteristics of behaving like human beings (Stair, 1986) [27]. Computers, that is, machines that can exhibit artificial intelligence; computers that will have the capability to mimic human mental abilities and other problem-solving capabilities are referred to as Artificial Intelligence.

Broadly, artificial intelligence is the computer-based exploration of methods for solving challenging tasks that have traditionally depended on people for solutions. Such tasks include complex logical inference, diagnosis, visual recognition, and comprehension of natural language, game playing, explanation, and planning (Horvitz, 1990) [9]. In brief summary, it is concerned with developing computer systems that can store knowledge and effectively use the knowledge to help solve problems and accomplish tasks.

Artificial Intelligence, in light of this definition of intelligence, is simply the application of artificial or non-naturally occurring systems that use the knowledge-level to achieve goals. In the early 1960s, Marvin Minsky indicated that "artificial intelligence is the science of making machines do things that would require intelligence if done by men. In like manner, Selvamanikkam (2018) [24] conceptualized Artificial Intelligence as an approach to make a computer, a robot, or a product to think how smart human thinks, as well as a study of how human brain thinks, learn, decide and work when it tries to solve problems.

Presently, the Japanese have started producing intelligent computers that contain programs that invariably imitate human intelligence that could make intelligent decisions like human beings (Stair, 1986) [27]. Again, Straubhaar and LaRose (1995) advanced that others foresee neuro-computers that will replicate the physiological structure of the human brain…; computers that will be able to 'learn' simple tasks without the necessity of giving them detailed instructions beforehand.

Kurzweil (1990) [11] has also defined AI as, "The art of creating machines that perform functions that require intelligence when performed by people." Rich and Knight (1991) [20] conceptualized it as, "The study of how to make computers do things at which, at the moment, people are better." Artificial Intelligence currently encompasses a huge

variety of sub-fields, ranging from the general (learning and perception) to the specific, such as playing chess, proving mathematical theorems, writing poetry, driving a car on a crowded street, and diagnosing diseases. AI is relevant to any intellectual task; it is truly a universal field; it is an area of computer science that emphasizes the creation of intelligent machines that work and reacts like humans (Russell and Norvig, 2010) [22].

Historical development of Artificial intelligence

There is no doubt that we currently live in a continuously changing era, whereby new knowledge is being created at a pace we can barely keep up with (Baker, 2019) [3]. However, as the world advances, though has no specific effects to any one field or profession, but the entire society, the onus lies on us to constantly update our knowledge and skills to adapt to the changing scenario. The education system is not left out of these technological advances. As a result, Artificial Intelligence is one of the newest fields in science and engineering that came into prominence soon after World War II (Russell and Norvig, 2010) [22]. It is a product of fifth-generation computers
(Stair, 1986) [27].

The idea of Artificial Intelligence or machine learning dates back to 1956 (Moursund, 2006) [17]. The first work recognized in the field of artificial intelligence was presented by Warren McCulloch and Walter Pitts in 1943. McCulloch research on the central nervous system resulted in the first major contribution to AI: a model of neurons of the brain (Negnevitsky, 2005) [18]. The term finally came to prominence when John McCarthy coined the phrase "Artificial Intelligence" as a topic of a 1956 conference held at Dartmouth (Buchanan, n.d.). In 1958, McCarthy presented a paper, 'Programs with Common Sense', in which he proposed a program called the *Advice Taker* to search for solutions to general problems of the world (McCarthy, 1958) [14] in (Negnevitsky, 2005) [18].

Machines were developed and programmed with the capability to think and reason like humans, to feel and take actions on their own without human aid. In fact, they were designed to have "Superintelligence", such intelligence that will enable them to perform tasks equivalent to human intelligence (Stair, 1986) [27]. The term is also referred to as "Machine intelligence" helps to stress that we are talking about something that is quite different than human intelligence. Therefore, the overall goal of artificial intelligence is to create technologies that allow computers and machines to function in an intelligent manner like humans.

Educational Relevance of Artificial Intelligence

The advent of Artificial Intelligence in the field of education has raised lots of fears and questions, especially by teachers. Battro and Dehaene (2016) [4] have raised some of these fears thus: "AI has triggered a number of myths and fears already; AI will be either the best or the worst thing ever to happen to humanity; will machines soon surpass us in all domains of human competence? Will intelligent machines soon pose a danger to humanity?" Another fear is that humans will lose their thinking abilities relying too much on AI. These are fearful questions posed by individuals, who are very sceptical about the advent of intelligent machines in the field of education.

Notwithstanding, technological advancements have given rise to the use of Artificial Intelligence in day-to-day activities, thereby reducing human effort. Kurshan (2016) [10] recently noted that our world as we know it presently is running on artificial intelligence, whereby Siri manages our calendars, Facebook suggests our friends, computers trade our stocks, cars park themselves, and air traffic control is almost fully automated. The scholar further observed that virtually every field has benefited from advances in artificial intelligence (from the military to medicine to manufacturing), but wondered why these recent advancements in artificial intelligence have not effectively advanced the education industry.

However, in spite of the above fears and scepticism by scholars, artificial intelligence has generally been credited with numerous advantages in different areas of human endeavour with the education sector not exempted. In the world of education particularly, artificial intelligence is currently revolutionizing schools and classrooms, giving high positive outcomes by reducing cost, time, and increasing efficiency and/or accuracy thereby making teachers work a lot easier. Boden (1977) declared that the goal of artificial intelligence as a science is to make machines do things that would require intelligence if done by humans. While artificial intelligence may have not been able to truly replace human grading, it's getting pretty close to it (Teach Thought Staff, 2018). Firstly, let's look at some of the merits of AI in different areas, particularly in a teaching-learning situation as they try to do things supposed to be done by humans (teachers).

Luckin (n.d.) declared that the AI assessment system would be more accurate and cheaper than the human-intensive examination systems currently in vogue. The Scholar asserts that AI teaching assistants relieves teachers of unnecessary record-keeping and recording activities and also able to provide up-to-minutes information about any pupil/student through appropriate computer software. AI relieves teachers from the routine automatable parts of their jobs and enables them to focus on human communication for more efficiency. It could also be used to identify appropriate learning problems from a group of students that need specific support with the area of the curriculum.

Newby *et al* (2006) observed that the applications of artificial intelligence have addressed several challenges in several fields, including education. The author revealed that one of the successful results of AI research has been the development of "expert systems." The scholar posits that these are programs that embody the knowledge and the skills of an expert in a particular discipline. This as the scholar further asserts has proven to be successful in fields as diverse as oil exploration and medical diagnosis.

In the field of education, Newby *et al* (2006) declared that the concept of "expert systems" has led to the development of "Intelligent tutoring systems", which is sometimes referred to as "Intelligent computer-assisted instruction" (ICAI). These programs have been developed in various subjects, such as Mathematics, Geography, and Computer science. A good example is the "Cognitive tutor", an intelligent tutoring software in secondary school mathematics from Carnegie learning (http://www.carnegielearning.com), which has now been adopted in many other schools in the US. Emphasizing the importance of this software, the scholar asserts that intelligent tutoring systems usually combine detailed information about the subject area and a database of common students' mistakes with a model of student performance to diagnose a given student's level of

understanding and provide instruction designed to meet the student's specific needs.

Another contribution of AI research in the field of education is the development of *speech and handwriting recognition systems*, which translates speech into text that the computer can manipulate, and some support basic commands, such as opening or closing applications issued by voice. It is of note that speech recognition software is now part of the operating system on Tablet PCs and Personal Digital Assistances (PDAs) (Newby *et al*, 2006). This software as confirmed by Newby *et al* (2006) translates handwritten note into text that can be saved and edited on the computer. Again, Woolf (2009) in Kurshan (2016) [10] stated that the applications of artificial intelligence have addressed several challenges of learning, including language processing, reasoning, planning, and cognitive modelling.

Another input of AI in the education arena could be observed through computer software - *Intelligent Tutor Systems* which is capable of tracking the "mental steps" of the learner during problem-solving tasks to diagnose misconceptions and estimate the learners' understanding of the domain. The same computer software (Intelligent Tutor Systems) can as well provide timely guidance, feedback and explanations to the learner and can promote productive learning behaviours, such as self-regulation, self-monitoring, and self-explanation. (Azevedo & Hadwin, 2005; Shute, 2008; VanLehn, 2006) in Kurshan (2016) [10] furthermore stressed that *Intelligent Tutor Systems* can prescribe learning activities at the level of difficulty and with the content most appropriate for the learner. VanLehn (2011) in Kurshan (2016) [10] as well, pointed out that these systems are also able to mimic the benefits of one-to-one tutoring, and further opined that some of these systems outperform untrained tutors in specific topics and can approach the effectiveness of expert tutors.

Another educational stride of artificial intelligence is the development of *computer recognition software* that has the capability to translate handwriting notes into text, which can be saved and edited on the computer. Again, with the development of *wireless computing*, that is playing an important role in schools as many schools today can be connected without running wires to every computer network workstations. As observed by Newby, *et al* (2006), Bluetooth, another wireless networking standard that support short-range connectivity between computer and other peripherals, such as printers is playing permanent roles in schools as it gives schools and teachers more flexibility in using computing resources in view of the fact that it removes the necessity to always be tethered (connected) to a wire.

In addition, the arrival of broadband network connectivity has made it possible for easy connection of information. This type of connection is far better than dial-up services, which waste more time (Newby *et al*, 2006). These scholars further observed that the advent of this broadband network connectivity has made it very possible for easy use of information-intensive applications, such as video and audio.

Furthermore, Newby *et al* (2006) have equally observed that the inception of *hand-held devices* have made it possible for most schools to move away from desktop computers to laptop and tablet personal computers. These devices, the scholars stressed have found their way into the classroom, especially in mathematics lessons. In today's world, personal digital assistants can be found in many classrooms, performing multipurpose tools mostly used in data entry, calculation, note-taking, browsing, etc. In view of the smallness of the device, they have displaced more sophisticated and expensive computers as observed in our schools today.

However, other areas, such as virtual reality and ubiquitous computing (pervasive computing or distributed intelligence are waxing stronger to make more impact in the education arena. There is no doubt that some basic activities have been automated in the field of education. With specialized artificial intelligence program; it's now possible for machines to automate grading for nearly all kinds of multiple-choice questions. Nowadays, essay-grading software that simulates the behaviour of a teacher is available. The program helps teachers' grade tests automatically by assigning grades to essays written by students in an educational setting, which invariably create rooms for teachers to focus mainly on in-class activities, prepare for class, or work on professional development and students' interactions (TeachThought Staff, 2018). AI again enhances objectivity and equality. Human beings are imperfect. As Kharkovyna (2018) puts it, making errors is an essence of human nature. Even if you want to avoid it, you will never escape it. Robots are perfect in making an objective type of questions as they are not prone to human error.

Artificial intelligence has provided an avenue for individualized instruction or learning that specifically adapt to students needs through notable educational software (e.g., Khan Academy) (TeachThought Staff, 2018). The impacts of these adaptive learning programs are already impacting on students; as they work at their own pace at all the education levels via games. The software put greater emphasis on some topics by repeating them several times for students to have a mastery of the said topic. It is assumed that the effective use of artificial intelligence in schools can track the progress of an individual student and adjust the course or inform the teacher about the material that was given a student that has difficulty comprehending.

Despite the fact that there are definite things that machine cannot do, for now, lots of evidence(s) abound that some tutoring programs, based on artificial intelligence already exist and capable of helping students solve some basic mathematics, writing, and other subjects problems. These programs are capable of teaching students some basic fundamentals principles of handling some mathematical tasks. This has been very good support for students in solving mathematical problems.

Artificial intelligence has the capability of identifying gaps, that is, students' confusion about certain concepts and makes suggestions for additional learning materials, which lecturers/teachers may not easily identify during lectures. Coursera, one of the world's massive open online course (MOOC) providers are already putting this into practice (TeachThought Staff, 2018).

Another method of instruction, Intermediate interval education has been discovered. This has made another impact in the education sector due to educational application invented by a Polish, Peter Wozniak. This scholar invented an educational program based on the effect of interval. The application keeps track of what students' are learning. Using artificial intelligence, the application can find out when students must have forgotten, and at the same time recommends for revision. This revision makes it possible for

the information to be stored in the student's memory for a longer period.

Another technological stride is the virtual facilitators; the new teacher's assistant named Jill Watson, which has emerged in the educational domain. This technology, which arterially represents the human teacher, quickly and accurately answers students' requests as if it is the human teacher. When this was practised at the Georgia Institute of Technology, students, though fascinated by the artificial teacher, but never knew that Watson's true identity was actually a computer equipped with an IBM-AI system. These virtual facilitators are very helpful to students and teachers in particular, as the computer program minimizes the work of teachers.

Proctoring is making a significant impact on distance education. Proctoring or proctored test is a mechanism that ensures that a learner that takes a test is the authentic person and also prevents the person from cheating by means of a proctor, which is present during the period of the test. This proctoring software is significantly helping to check examination malpractices in distance examinations.

Computers can be programmed to carry out very complex tasks. For instance, discovering proofs for mathematical theorems or playing chess with great proficiency in which sometimes, artificial machines win humans (Copeland, 2019) [6].

**Shortcomings of Artificial Intelligence**

Since the inception of artificial intelligence in the 21st Century, particularly around the education sectors, many educators have expressed fairs about the safety of their jobs and to the entire education system. These educators believe that these intelligent machines may put them out of jobs and ruin the profession they have long cherished. Rose Luckin, an artificial intelligence and education expert at University College London's Institute of Education expressed fears that schools in disadvantaged areas could in future be forced to rely on cheap models of technology, rather than professionals. The scholar further states that disadvantaged pupils will be left to be supervised by 'bouncers and minders' unless teachers speak up (Santry, 2018) [23].

However, this class of scholars have come out with some shortcomings of AI in education, and let us examine the major ones as outlined hereunder.

No Quality but Quantity: Kharkovyna (2018) declared that artificial intelligence makes room for quantity and not quality. The author believes that when a certain job is severally performed by humans, they eventually do it better. With reference to a teacher, when he spends years teaching a course/subject, invariably he will perform better. But this is not the case with robots as they work by the algorithm that is not influenced by the repetition of the task. Therefore, their experience doesn't matter and doesn't make them any better (Kharkovyna, 2018).

High Administrative Cost: Artificial intelligent really is expensive. Most jobs performed by teachers in the school are done manually. But AI is presently is synonymous with electricity. If every school has to employ the services of robots, then the amount of power to use will be enormous, as the school will incur more bills, and this will only suit schools operating on big budgets. Consequently, only schools of this capacity that could install and repair that can definitely benefit from AI classes.

Joblessness: There is no doubt that intelligent machines have started taking over educators jobs. Once robots start replacing teachers, there is bound to be protests and/or industrial revolutions.

Programmed Encounter: The work of AI is a straightjacket type of job. There is a lack of personal engagement between the robot and the students. As Kharkovyna (2018) observed, educators are not just "knowledge packs", they offer personal guidance, make an influence, and lead by example. Therefore, the absence of personal interactions with students does not impact much experience for students.

Lack of Alternative Teaching Methods**:** Some teachers require two or three teaching techniques to accomplish a lesson. A good teacher varies his lessons to achieve his objectives. Robots don't offer several teaching methods to impart knowledge to students. A robot, however, will offer a standard solution with no alternative variants, said Kharkovyna (2018).

Lack of Instructional Materials: Effective teacher adopts various types of instructional media to deliver his point(s) in the classroom. But can robots teach with instructional materials? Can robots vary instructional media why teaching? AI machines lack these methods of teaching that enriches the lesson.

AI Widens the Gap between the Rich and the Poor: In as much as robots and other AI learning tools require electricity to functions, so also do tablets and laptops are required for lessons. This becomes a problem to not-so-rich students to purchase the above, thereby they will be deprived of the alternatives of learning.

Learning Style: How could robots and other AI handle the case of fast and slow learners in the classroom? The straightjacket methods of AI have no place for slow and fast learners. Hence, these fast and slow learners are deprived.

Technological Addiction: There is a high risk of technological addition since daily tasks/functions perform and effective decision-making greatly depends on machines.

Risk of Education Divides: It has been advanced that with the development of artificial intelligence that the least developed countries will definitely be at risk of suffering new technological, economic and social divides since most of them cannot provide the basic conditions needed to technological infrastructure needed for the implementation of the new strategies that take advantage of artificial intelligence to improve teaching and learning in the field of education.

Training Teachers to Use AI Tools: The advent of new technologies in education also requires new skills to match such technological innovations. Thus, the introduction of artificial intelligence means preparing teachers for an artificial intelligence-powered education system. For effective implementation of the artificial intelligence-powered education system, teachers/educators must be trained and re-trained to be abreast of the new digital expertise. What it means is that machines lack viewpoint, moral code, and originality or initiative of humans.

**The future of Artificial Intelligence**

There is much-expected growth of artificial intelligence in the education arena. Lynch (2018) [13] has declared that the artificial intelligence market in the US education sector 2017-2021 report suggests that experts expect artificial intelligence in education to grow by 47.50% during the period under review The scholar further opined that while

artificial intelligence will not replace teachers altogether, it is possible that it will reshape the way teachers teach and students learn in the years to come.

**Conclusion**

Newer technologies have made work and life generally easy for humans. The development of Artificial Intelligence software has become an indispensable part of our everyday life or activities. It is an approach to make a computer, a robot, or a product to think how smart humans think; a study of how human brain think, learn, decide and work when it tries to solve problems (Selvamanikkam, 2018) [24]. The use of AI is experienced in both small and big jobs, as they remove much job pressures from human beings, especially the teachers in the educational arena. In recent times, educational programs powered by AI are already helping students to learn basic skills and likely to offer students a much wider range of opportunities/services as more input is made by scientists (TeachThought Staff, 2018). These machines automatically and systematically perform essential jobs, principally in production areas (Rounak, 2017) [21]. The use of this tool can be observed in different areas of human endeavour, as it can be used to diagnose medical problems, help locate oil, forecast weather patterns and systems and other valuable materials (Stair, 1986) [27]. It essentially implies that human intelligence can be reduced to a mechanical device. However, in spite of the fact that computer engineers/specialists have designed and developed machines that mimic humans, they are yet to develop machines that can accurately think and reason like humans. However, with the rate at which technology is advancing, the prospects of artificial intelligence machines are becoming brighter, and have the potential to radically change most of the things we do in the education and other sectors of the economy.

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