

ARTIFICIAL INTELLIGENCE AND THE FUTURE OF EDUCATION

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ABSTRACT

Future of Education has been captivated with the prospect of artificial intelligence (AI). The study focuses on how learning has become more automated than it is now due to the usage of AI in education, which will render instructors unnecessary. AI has the potential to elevate learning to a whole new level, elevating it above the replacement of teachers and impersonalizing it. With the help of a virtual teaching assistant, teachers can provide students with access to a wealth of information instantly, tailor supplemental learning materials to each student's interests and needs, and enable students to connect with other students and a virtual peer or tutor whenever and wherever they need it. This could result in more valuable time being spent in the classroom facilitating more interactions between students and teachers as well as more interesting learning opportunities. The essay also suggests ways to increase the potential for education by using the combined knowledge of educators and learners with the aid of artificial intelligence. The report acknowledges that education on AI is necessary for bringing enormous changes in the World.

Keywords: Artificial Intelligence, Education, Cognitive Psychology, Metacognition, Audio Learning, Open Space Learning, Cyber Learning, Collective Intelligence.

INTRODUCTION

“Predicting the future isn’t magic, it’s artificial intelligence.”

–Dave Waters

We’ve seen blockbuster films like “A Space Odyssey” and “Star Wars” featuring intelligent robots sprinkling throughout. The time is drawing closer to the astute and frequently noteworthy deployment of AI technology in a variety of fields that, while not as revolutionary as androids, will nonetheless significantly impact our daily lives. Artificial intelligence plays a crucial role in bringing about significant transformations in education. Artificial intelligence (AI) has emerged as a major contemporary concern that improves society and education. The education industry has embraced artificial intelligence just as the rest of the world commutes and cuddles with it. Numerous websites provide free educational content online, reaching a larger audience than ever before. Both personalised learning and exploratory learning are being implemented in the new educational system. Innovation in the field of education is much needed, and the development of artificial intelligence could bring about that innovation. When AI is used properly, it may give

kids a much more comprehensive and important education. AI programmes are better able to identify and pinpoint each student's unique strengths and shortcomings, and they can assist teachers in gaining more valuable teaching and learning time with their students. All things considered, the appropriate integration of artificial intelligence in educational institutions has the potential to significantly boost educational systems worldwide.

LITERATURES REVIEW

Artificial intelligence (AI) is transforming the education sector in various ways, offering numerous benefits and challenges. As noted by Holmes et al. (2019), "AI has the potential to revolutionize the way we teach and learn, making education more accessible, effective, and efficient."

Benefits of AI in Education

Personalized Learning: AI-powered adaptive learning systems can tailor the learning experience to individual students' needs, abilities, and learning styles. According to Luckin et al. (2016), "AI can help teachers to personalize learning, making it more effective and engaging for students."

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Improved Academic Achievement: AI can help students achieve better grades and academic outcomes by providing real-time feedback, guidance, and support. As stated by Knight et al. (2018), "AI-powered feedback systems can provide immediate and detailed feedback to students, helping them to improve their performance."

Challenges of AI in Education

Ethics and Transparency: The use of AI in education raises concerns about bias, fairness, and transparency. As noted by Williamson (2017), "AI systems can perpetuate existing biases and inequalities if they are not designed with fairness and transparency in mind." The use of AI in education raises concerns about bias, fairness, and transparency. Researchers have emphasized the need for transparency and accountability in AI-powered educational systems.

Plagiarism and Academic Integrity: AI-powered tools can make it easier for students to plagiarize or cheat, which can undermine academic integrity. According to Selwyn (2019), "The use of AI-powered tools raises important questions about academic integrity and the need for new forms of assessment and evaluation."

Adoption and Implementation: Despite the potential benefits, there are concerns about the adoption and implementation of AI in education, including issues related to infrastructure, training, and support.

AI-powered Learning Systems: Researchers are exploring the development of AI-powered learning systems that can provide personalized learning experiences, real-time feedback, and support.

Ethics and Fairness: There is a growing need for research on ethics and fairness in AI-powered educational systems, ensuring that these systems are transparent, accountable, and free from bias.

FUTURE OF AI IN EDUCATION

Increased Adoption: AI is likely to become more widespread in education, with more institutions adopting AI-powered tools and systems. As predicted by Spector (2019), “AI will become an essential tool for teachers and educators, helping them to personalize learning, improve student outcomes, and enhance teaching practices.”

New Forms of Assessment: AI may enable new forms of assessment and evaluation, such as automated grading and feedback systems. According to Ifenthaler et al. (2019), “AI-powered assessment systems can provide immediate feedback and support to students, helping them to improve their performance and achieve better learning outcomes.”

OBJECTIVES OF THE STUDY

The paper seeks to set the following objectives to analyse the prospects of Artificial Intelligence in educational field the near future. Here are the objectives below:

- I. To justify the use of Artificial Intelligence in formal education such as School, college and University education system.
- II. To verify the use of Artificial Intelligence in informal and non-formal education that is in audio space learning, open space learning and cyber space learning.
- III. Identifying the Cognitive and Meta cognitive system of Human Mind more appropriately to discover the most wonderful Artificial Intelligence for Excellent learning process.
- IV. To explore the role of Artificial Intelligence in Academic Advisory process by Collective Intelligence and Robots with Artificial Intelligence for appropriate execution of the academic system.

METHODOLOGY

Our study explores the role of artificial intelligence (AI) in education, focusing on its potential applications and impact on teaching-learning and educational management. By incorporating AI-generated images, we’ve likely examined various aspects of AI in education. Our study likely investigates these aspects and more, providing insights into the potential benefits and challenges of AI in education.

FINDINGS OF THE STUDY

Finding 1: Application of Artificial Intelligence in Formal Education System like Schools, Colleges and Universities

AI in School Education System

Tech Thought Staff (2018) states that science fiction writers, futurists, and filmmakers have been projecting the incredible—and occasionally disastrous—shifts that will occur when artificial intelligence becomes widely used for decades. AI hasn’t really created a lot of noise thus far, and it’s actually quietly permeated many facets of our everyday life. Artificial intelligence

of one form or another is present everywhere and can be helpful in the field of education in schools in the following ways. Examples of this include intelligent sensors that back up to take flawless pictures, automated parking features in cars and annoying personal assistants on smart phones.

- ***Educational Softwares can be Adapted to fulfil the needs of the students***

Applying higher levels of individualised learning is one of the main ways AI will impact education, from kindergarten to graduate school. A portion of this is already taking place thanks to the proliferation of adaptive learning applications, games, and software. By emphasising particular topics more, repeating lessons that students have not yet learned, and generally assisting students in working at their own pace, these systems adapt to the demands of the learner. With the help of initiatives like Khan Academy, adaptive learning has already had a significant global impact on education. As artificial intelligence (AI) develops over the next several years, these kinds of programmes should only get better and more widespread.

- ***Students could get additional support from AI tutors***

In the future, more students may receive tutoring from tutors who only exist in zeros and ones, even though there are undoubtedly benefits that human tutors can provide that computers cannot at least not now. There are currently some artificial intelligence-based intelligent teaching programmes available that can assist kids with writing, basic maths, and other disciplines. Although these programmes can teach kids the fundamentals, they are currently not the best at teaching them how to think creatively and with higher order thinking. ITalk2Learn by “Mika” keeps an eye on younger pupils, noting their development, emotional condition, and mental needs while they work through maths.

- ***AI programs can give students and educators helpful feedback***

AI can give instructors and students feedback on the overall success of the course in addition to assisting them in creating courses that are tailored to their individual needs. AI systems are being used by certain online colleges to track students’ progress and notify instructors when there may be a problem with a student’s performance. These artificial intelligence (AI) technologies assist both students and instructors in finding areas where they might construct lessons for pupils who might struggle with the subject.

- ***AI is altering how we find and interacting with information***

The way we engage with data and information has drastically evolved over the last few decades because to AI-based technological solutions. Future students with greater technological integration may view research and development and fact-finding very differently from today’s students.

- ***AI could change the role of teachers***

Teachers will always have a place in education, but as a result of new technologies like intelligent computer systems, that position may change. As we’ve already seen, AI can help students learn more effectively, replace human coaching, and even take over responsibilities like grading. However, AI could also be tailored to a wide range of different teaching exposures.

AI systems might be designed to offer knowledge, acting as a resource for students to seek information and ask questions, or they might even be able to substitute instructors for some course topics. AI will typically cause students to take on the role of the teacher. Many of these changes in the classroom are already being driven by technology, particularly in online schools that use the flipped classroom paradigm. AI will help instructors work more productively rather than rendering them obsolete, freeing up more time for important duties.

- ***Data fuelled by ai can substitute how schools find, teach and supports students***

Colleges and universities are transforming the way they engage with both present and potential students by implementing clever data gathering strategies supported by sophisticated computer systems. Intelligent computer technologies are helping to make every aspect of the college experience more precisely matched to the requirements and aspirations of students, from recruitment to choosing the ideal courses for them. The current landscape of higher education already heavily relies on data mining technologies, but artificial intelligence has the potential to drastically change the field much more.

- ***AI may change when students learn, who teaches them and how they acquire basic skills***

Even though significant changes in schooling might not occur for several decades, it is true that artificial intelligence has the power to drastically alter almost everything we currently take for granted. Students can learn from anywhere in the world at any time with the help of AI systems, software, and assistance. Since these programmes can substitute for some forms of classroom Instruction, artificial intelligence may eventually replace instructors in certain situations.

- ***AI Can Automate Some Basic Activities***

Even while AI can't completely replace human grading, the gap is closing. These days, teachers can grade almost all multiple-choice and fill-in-the-blank exams on their own, and automated grading of student papers is also possible. While essay-grading software is still in its early stages and not quite there yet, it will likely get better in the upcoming years, freeing up professors to spend more time with their students and doing in-class activities rather than marking essays. AI is still in its infancy as a compelling, essential component of the classroom. Teachers are utilising more artificial intelligence (AI) in order to provide more personalised learning experiences for their pupils, thanks to intelligent tutoring programmes and content. With the advancement of ITS technology, kids could have access to a personalised learning platform that lasts a lifetime.

Findings 2: Application of artificial intelligence to change in college and university education system

Figure 1 illustrates how many scientists, according to the World Economic Forum (Dogson, M., Gann, D., August 9, 2017), are confident that AI and machine learning will enhance the process of scientific discovery. Eight (8) years have passed since researchers at the University of Aberystwyth developed a robotic system that was able to conduct every step of the scientific

method independently, including developing hypotheses, planning and carrying out tests, evaluating results, and selecting which experiments to conduct next. Exams and marking assignments for lengthy lectures in college can be challenging tasks. Teachers frequently discover that grading takes up a large amount of time, even in lower grades, time that could be spent interacting with students, getting ready for class, or working on professional development. We can already see how AI will impact the future of higher education.

Artificial intelligence (AI) has the capacity to generate hypotheses on its own, make unexpected connections, lower the cost of acquiring knowledge, and be more predictive. AI is being utilised by several publishers, including Reed and Elsevier, to automate systematic literature reviews. It can also be used to detect instances of plagiarism and statistical misuse.

Diagram 1: University Education leads by AI



Source : Blog Mackenzie (2019)

“If you look at the field of robotics today, you can say robots have been in the deepest oceans, they have been everywhere, but they are just now starting to come into your living room,” stated Dr Cynthia Breazeal, Founder and Chief Scientist of Jibo. For robots, your living room is the last frontier. (J. Roberts, August 31, 2016)

- ***Open space learning***

Open-space Learning, or OSL, is a pedagogic methodology. OSL is also a trans-disciplinary pedagogy that is dependent on the use of physically open spaces - in the sense that tables and chairs are absent - and an open viewpoint to intellectual content and the role of the tutor as is shown in figure 3. Participants in OSL, typically but not solely, grasp in a ‘embodied’ way. In OSL, the workshop is the elementary activity of pedagogic interplay. Such as OSL activities include ‘still image’ or ‘tableau’, in which participants embody sometimes-abstract ideas; ‘theory building’, in which participants create a narrative, a concept, or a ‘theory’ from a collection of materials relating to a particular subject; and simulation and role-play (Wikipedia free Encyclopaedia 1st Aug.2018).

Diagram 3 : Open learning system for many people



Source : Monash University (2014)

- ***Cyber space learning***

A cognitive space that can be accessed by computers and used by people to interact with texts and AI-generated virtual reality avatars in educational contexts is known as educational cyberspace. In fact, students are concentrating on one or more instances or their comprehension of texts as they engage with multimedia on their computer displays. Figure 4 depicts the Cyberspace Learning method.

Diagram 4 : Close-up of a Robot's Hand Typing On Laptop



Source : Tech Talks (2019)

In fact, it is predicted that the use of classroom AI may be increased by 50% from 2017 to 2024.

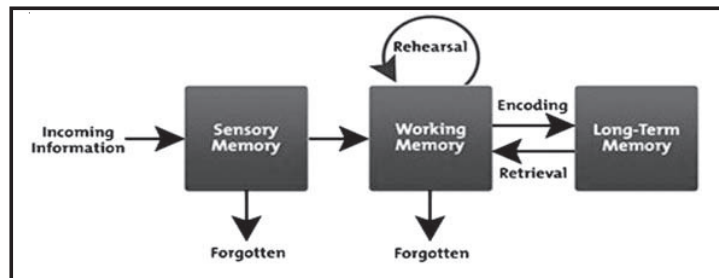
Finding 3: Identifying the cognitive and meta-cognitive system of human mind more appropriately to discover the most wonderful artificial intelligence for excellent learning process.

- ***AI and cognitive psychology***

Our brain has been shown to be an information processing system. This theory is further supported by artificial intelligence, and the image depicts the brain's information processing model. According to Daroczy, G. Jan. (2010), stimuli must be evaluated to represent cognitive psychology and artificial intelligence. In the near future, AI will play a major role in developing cognitive processes and correctly detecting them, which will help learners learn quickly and

tackle challenging tasks with ease. Diagram 5 illustrates the technological procedure for creating the cognitive psychological process.

Diagram 5 : Cognitive process of Human Mind for better AI



Source: The Modal Model of Memory Atkinson & Shiffrin (1968)

- **AI and meta-cognition**

The study presented in this paper is centred on the premise, which is illustrated in figure 6, that an intelligent tutoring system that offers advice regarding students' metacognitive skills can assist them in becoming better learners. Numerous classroom studies have demonstrated how teaching learning programmes that place a significant emphasis on the meta-cognition process can enhance students' learning outcomes (Brown & Campione, 1996; Palincsar & Brown, 1984; White & Frederiksen, 1998). This was demonstrated by A. Vincent, McL. Bruce, R. Ido, K. Kenneth, Jan 2006. Therefore, whether intelligent tutoring systems can effectively assist meta-cognitive skills is an essential subject. A limited amount of research indicates that it is capable of performing.

For instance, research has demonstrated that the development of knowledge and domain-specific skills can be positively impacted by supporting self-explanation, a crucial meta cognitive skill (Aleven & Koedinger, 2002; Bunt, Conati, & Muldner, 2004; Conati & Van Lehn, 2000; Mitrovic, 2003; Renkl, 2002; Trafton & Tricket, 2001). Gama's (2004) work is a another illustration of his proficiency in having pupils evaluate their own competence levels.

Diagram 6: Meta cognitive process for better AI



Source: Forbes (2018)

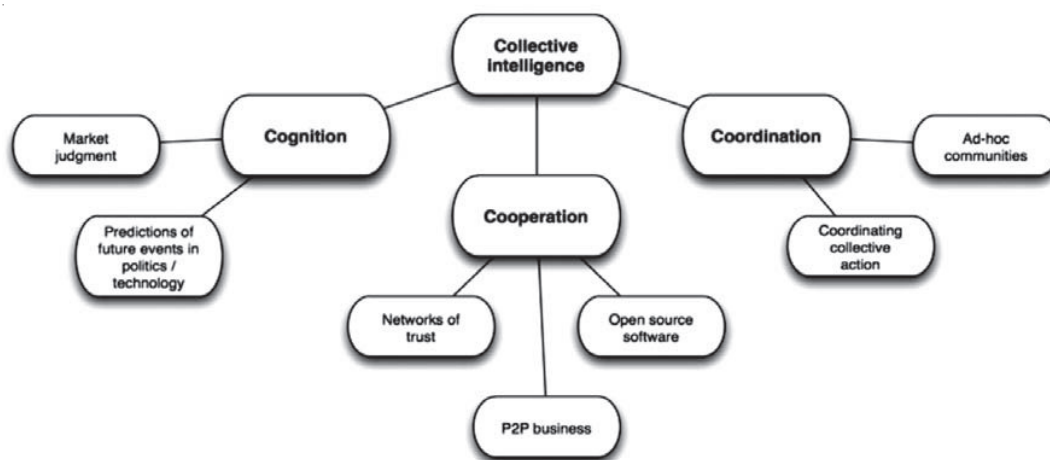
Finding 4: To explore the role of artificial intelligence in academic advisory process by collective intelligence and robots with artificial intelligence for appropriate execution of the academic system.

- ***Academic advisory by collective intelligence***

As seen in Diagram 7, collective intelligence (CI) or group intelligence arises from the cooperation, group efforts, and rivalry of numerous individuals and manifests itself in consensus decision making. The movement from individual knowledge and power to communal knowledge and power is greatly aided by collective intelligence. Free open source intelligence will eventually produce better results than information produced by proprietary software created within corporations.

Raymond (1998) and J.C. Herz (2005) (Flew 2008). According to media theorist Henry Jenkins, convergence culture is connected to collaborative intelligence as a “alternative source of media power.” The argument that collective intelligence is crucial for democratisation is supported by both Levy (2007) and Jenkins (2008). This is because collective intelligence fosters a better understanding of diverse societies, particularly in the modern era, and is linked to knowledge-based cultures.

Diagram 7 : Types of Collective Intelligence for academic advisory



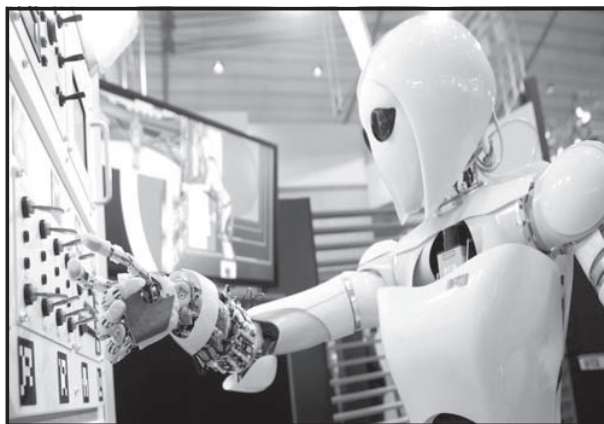
Source : Wikimedia Commons (2020)

- ***Academic advisory by robots***

When we are too sluggish to recall something or question a human, we Google it. We frequently question Siri and Cortana about the weather now that we've grown used to them. Diagram 8 illustrates how the current generation of artificial intelligence can extract information from the internet to schedule appointments, make jokes, and more. What if you had a crucial helper to guide you while making decisions about real-life commitments, including whether to

enrol in business school or launch a brewery? The goal of IBM and the University of Michigan's Project Sapphire is to create an artificially intelligent academic advisor that helps undergraduate students choose their courses, select extracurricular activities, and ultimately offer career guidance.

Diagram 8 : Academic advisory by robots



Source : Business Insider (2019)

The college campus has been chosen by both research teams as their starting point because they believe that studying the relationships between thousands (1000) of students and their professors will aid in the development of a conversation system with an EQ that corresponds with its IQ. When responding to your inquiries, digital colleagues over the phone use rule-based technology to generate relevant feedback. In this sense, the responses are somewhat predetermined, but real-world discussions are erratic and full of emotional indications that current virtual assistants aren't Yet trained to pick it up on.

CONCLUSION

Over the coming years, artificial intelligence (AI) systems will alter the dynamics of human-machine interaction. Although Project Sapphire is currently housed inside a university, its knowledge and emotional intelligence will eventually be applied to all human-machine interactions. In order to better serve our objectives, our machines will be able to comprehend us and our context. Although it's unlikely that we'll see humanoid robots teaching in the next ten years, a number of initiatives are now underway that leverage computer intelligence to improve learning outcomes for both teachers and pupils. These are just a few examples of how those tools, and others that come after them, will influence and characterise future educational experiences.

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