

A Study on AI Role in the Modern Education System

Ashish Kumar¹, Dr. Kamalraj R²

Student¹, Professor², MCA, School of CS & IT,

Jain (Deemed to be University), Bangalore, India

Abstract:

Nowadays, artificial intelligence (AI) is used in practically all facets of our lives. The purpose of the current study is to investigate how teachers and students view the application and efficacy of AI in the classroom. Such systems have already been developed in large part thanks to AI, but more research is still needed to get past the current constraints. AI is viewed as both a curse and a blessing for the educational system and human intelligence. Positive use of AI in the classroom is greatly encouraged. The majority of teachers are found to be more open to embracing new technology advancements than students. Additional investigation on teacher and student perspectives based on generational and geographic variety may help enable AI in education more successfully. AI enables the detection of problems and the provision of suitable remedies. For instance, if a student is about to drop out, provide them with alternatives, look for courses that can be tailored to the needs of each student, manage attendance, and stop school dropouts.

Keywords:

Education, Artificial intelligence, Computer-assisted instruction, Modern Education

1. Introduction:

The development of computer systems that are capable of doing activities that typically require human intelligence, such as speech recognition, decision-making, and language translation, is known as artificial intelligence (AI). The development of powerful AI systems that are capable of solving challenging issues and picking up new skills has been accelerated in recent years by improvements in machine learning and data processing.

As a potentially game-changing technology in the realm of education, artificial intelligence (AI) has received more and more attention. Numerous student data points can be analysed by AI, which can also customise learning experiences and give students real-time feedback. Nevertheless, despite the potential advantages of AI in education, there are also worries about its effects on the labour market, privacy issues, and the possibility of bias in AI systems.

This makes the topic of whether AI will ultimately enhance or harm the educational system complex and varied, necessitating thorough analysis of the numerous potential advantages and disadvantages of this technology. We will examine the current state of AI in education, the possible advantages and risks of its use, and the important factors that must be taken into account as AI is further incorporated into the educational system. We aim to offer a thorough overview of the role of AI in education and its potential impact on teaching and learning through an analysis of the existing literature and a discussion of current and emerging AI applications in education.

Teaching and learning process is happening since ages. Students' and teachers' performance is estimated on the basis of many criteria.

In general, a teacher looks at a student's behaviour, creativity, participation in extracurricular activities, rate of learning, deference to authority figures, etc., with the "student's attention to subjects and his ability to replicate his understanding in the exams" taking the top spot on the list. The list's top item is MARKES/GRADES for the student's topic understanding for a variety of reasons. One of the most crucial factors is the ability a teacher has to assess a student based on his or her responses to the questions within a set amount of time. Teachers who are already overworked with their professional and personal responsibilities must put up a lot of effort in measuring other elements of them. Teachers frequently rely on their previous notions while assessing these other talents. Hence, the grades of a student can be hardly relied upon to assess his actual skills, knowledge and abilities.

2. Literature review:

Technology has always played an important role in education, but its current use is more prevalent than ever thanks to the increased availability of smart devices and web-based curriculum. With the rise of Artificial Intelligence in education, there are many different ways it

is being used to help students learn. Here are a few technologies with AI that are already affecting and will affect education in every way.

Sharma et al. observed that AI in education has taken the form of adaptive learning systems, intelligent tutoring systems, and other systems that improve the quality of administrative processes, instructions, and learning [1]. United Nations Education Scientific and Cultural Organization (UNESCO) observed, that AI has permeated various sectors of the society, more particularly, the education sector, as discussed for example, instructions or teaching methods, approaches, and tools [2]. According to Indian Law, most of the universities in India have no specific research ethics committees to guide the researchers and researchers' rely on their own common sense to mitigate errors that may occur during the research practice [3].

There is another concern that if AI is put in place in schools, colleges and universities, we may diminish the role of teachers. It will be similar situation as in case of cricket where role of field umpire is significantly becoming irrelevant due to use of advance technology (Hot Spot, Hawk Eye). Therefore, there is fear that AI may replace the role of teachers and the concept of organized school system will be replaced by digital school system.[4] Online courses have enabled students from any region to participate in classes from any other country. In terms of online education, physical barriers between countries have been removed. Technology has enabled students to learn specialized skills from the best teachers, regardless of their location. Thanks to AI-powered training sessions, students now have a better chance of updating their skills. AI is being used in various courses in the field of information technology. That should come as no surprise given the industry's reliance on Artificial Intelligence[5]. Teachers seem more adaptable to the technological changes than students. Further research with a wider range of participants in different geographical locations and different age groups may bring in more inputs from teachers and students on the application of AI in education[6].

The impact of Chat GPT(AI) on the future of education remains a disturbing concern. Especially the thinking skills would be the early victim. At this stage, it may not be feasible to predict exact future complications. However, one thing is sure Chat GPT is not the end of such disrupting technological inventions! Artificial General Intelligence (AGI), Explainable AI (XAI), Deep Reinforcement Learning (DRL), Transfer Learning etc., are even much more advanced technologies likely to hit us very soon[7].

Pros:

- Using artificial intelligence helps to reduce human mistake.
- Contributes to dangerous missions that people are not capable of carrying out, such space missions and diving to the bottom of the ocean.
- Artificial intelligence (AI) is able to complete jobs longer than human labour while yet requiring ongoing human oversight.
- In order to protect customer data, businesses can rely on AI.

Cons:

- Because of machine complexity, there are more costs associated.
- Due to the fact that AI automates many jobs, people have grown lazy and dependent on their smartphones.
- AI has already displaced human work because it is easily able to carry out difficult and repetitive jobs.
- Currently, AI is unable to reproduce human connection and emotions, which are crucial for teamwork.

The following educational applications harness the power of AI to improve learning in students of all ages:[8]

1. **Thinkster Math:** Thinkster Math is a tutoring app that blends the math curriculum with a personalized teaching style. The app uses AI and ML to visualize how students think as they work through a math problem. This allows the tutor to quickly spot areas in the child's thinking and logic that need work. It then assists them by giving them immediate, personalized feedback.

2. **Brainly:** Students can ask homework questions on this education platform and receive automatic, verified answers from fellow students. Brainly, which ultimately helps students learn faster, uses ML algorithms to filter out spam.
3. **Content Technologies, Inc. (CTI):** This AI company uses deep learning to create customized learning tools for students. One of these tools, JustTheFacts101, makes it easy for teachers to import syllabi into a CTI engine. The machine then uses algorithms to create personalized textbooks and coursework based on core concepts. Cram101 is another example of an AI-enhanced offering, where any textbook can be turned into a smart study guide, providing bite-sized content that's easy to learn in a short space of time. The tool even produces multiple-choice questions, saving students time and helping them learn more effectively.
4. **Gradescope:** This platform makes grading less time-consuming (teachers' grading time is reduced by 70 percent or more) and provides student data that can indicate where they need additional assistance.
5. **Duolingo:** With more than 120 million users worldwide, Duolingo has a broad audience that reaches beyond the classroom. It offers 19 languages and helps anyone using the app to learn a foreign language, building their skills over time. With quizzes and other tests, the program adapts to each user's abilities to offer new challenges.

3. *Discussions:*

From the different studies reviews and articles, It is obvious that with technological advancements and innovations, computers and other technologies related to computers, as well as other innovations, have encouraged the development of artificial intelligence, which has permeated various spheres of society and may have a significant impact on various industries in which it is used. The education industry is one of these areas where AI has been used and is having a significant influence. A definition and description of AI was regarded necessary as a foundation and framework for comprehending how AI has affected education. When combined with other technologies like virtual reality, 3-D, gaming, and simulation, AI gives students hands-on or immersive learning opportunities that enhance their educational experiences. In one study, the negative effects of AI, the erosion of academic integrity, and cheating via paper churning and paper mill services that are made possible by AI were discussed or highlighted. The majority of the analysed papers illustrated and clarified the various uses of AI in education,

including their integration, advantages, and effects on management, instruction, and learning. The advantages, or pros, outweigh the drawbacks, or negative impacts.

Benefits:

One of the significant benefits of AI in education is that it can personalize the learning experience. AI-powered tools can analyze students' learning patterns and tailor the learning experience to meet their needs. This can lead to improved learning outcomes and increased student engagement. AI can also help to identify at-risk students and provide targeted support to help them succeed.

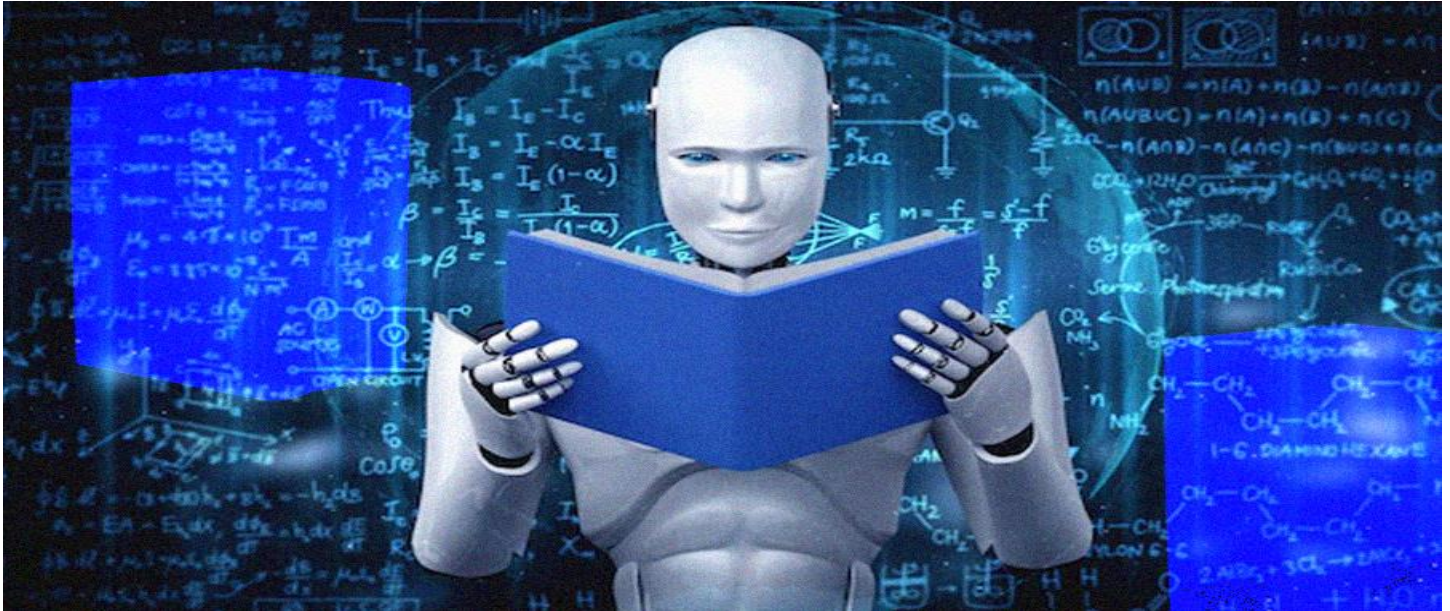
1. **AI in Assessment:** AI can play a significant role in assessment by automating grading and providing real-time feedback to students. AI-powered assessment tools can analyze students' responses to questions and provide immediate feedback, helping students to identify their strengths and weaknesses.

2. **AI in Curriculum Design:** AI can help educators to design and implement effective curricula. By analyzing data on student performance, AI can identify areas where students struggle and suggest improvements to the curriculum to address these areas.

3. **AI in Career Planning:** AI can help students to plan their careers by providing personalized guidance and support. AI-powered career planning tools can analyze students' skills, interests, and goals and provide recommendations for career paths and educational opportunities.

4. **AI in Language Learning:** AI-powered language learning tools can help students to learn new languages more effectively. These tools can provide real-time feedback on pronunciation and grammar, as well as personalized language learning activities based on the student's level and learning style.

5. **AI in Accessibility:** AI can improve accessibility in education by providing tools for students with disabilities. For example, AI-powered text-to-speech and speech-to-text tools can help students with hearing or visual impairments to access educational materials.



Img source: <https://www.analyticsinsight.net/what-is-the-role-of-artificial-intelligence-in-the-education-sector/>

Challenges:

Despite the potential benefits of AI in education, there are also several challenges. One of the significant challenges is the potential for AI to reinforce existing biases in the education system. AI algorithms can only learn from the data they are trained on, which can perpetuate existing biases and inequalities. Additionally, there are concerns about data privacy and security, as well as the potential for AI to replace human educators.

1. **Lack of Trust:** One of the significant challenges associated with the implementation of AI in education is the lack of trust. Many educators and stakeholders may be skeptical about the effectiveness of AI in the classroom, leading to resistance and reluctance to adopt new technologies.

2. **Digital Divide:** The implementation of AI in education can exacerbate the digital divide, with students from low-income households or under-resourced schools having limited access to technology and thus being left behind.

3. **Ethical Concerns:** There are ethical concerns around the use of AI in education, such as the potential for the technology to infringe on students' privacy, perpetuate bias, and limit creativity and critical thinking skills.

4. **Skill Gap:** The implementation of AI in education requires educators to have specific skills, such as data analysis and interpretation, which may not be part of their current skill set. This could create a skill gap that needs to be addressed through training and professional development.

5. **Cost:** The implementation of AI in education requires significant investment in infrastructure, technology, and training. This can be a significant financial burden, especially for under-resourced schools and institutions.

6. **Technical Issues:** The implementation of AI in education can be challenging due to technical issues such as integration with existing systems, compatibility with different devices, and data management.

4. Conclusion:

The use of artificial intelligence in various facets of daily life appears to be growing, as indicated by the findings of numerous researches. By supporting the teaching and learning process as an aid, AI in education began to make a name for it.

The current study identified that both teachers and students needed more understanding on how the application of AI can benefit them in developing their teaching and learning abilities respectively. It also identified that an optimum utilization of this technology may yield better results. Majority of the participants opined that replacing a teacher with a robot can only degrade the present education system and that AI should only be a support to the regular teacher, except in few situations where it demands the role of complete technological intervention.

In conclusion, AI has a significant role to play in the education system, providing opportunities for personalized learning, intelligent assessment, and efficient administration. AI-powered systems can improve the quality of education, reduce costs and administrative burden, and provide actionable insights for teachers to optimize their teaching methods. However, the implementation of AI in education also poses challenges and limitations, requiring careful consideration of ethical, privacy, and bias concerns. With proper investment and training, AI can revolutionize education, providing new opportunities for students and educators alike.

Additionally, AI can make classes and teachers fully available anywhere, round-the-clock. It can give students individualized feedback on tests, assignments, and other materials based on AI algorithms. With the use of AI in the education sector, students can design a successful future for themselves.

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