A CRITICAL ANALYSIS OF USE OF ARTIFICIAL INTELLIGENCE IN EDUCATION SECTOR

Dr Himanshu Rastogi

Professor, Amity Business School, Amity University Uttar Pradesh – Lucknow Campus (India)

ABSTRACT

Artificial intelligence (AI) is gaining significance in all the sectors of the economy and hence in higher education too. From last few years, this concept of "Artificial Intelligence in Education (AIED)" has experienced significant developments. In education, AI has begun producing new teaching and learning solutions that are now undergoing testing in different contexts. It is usually associated with computers and the Internet. Artificial intelligence in all areas of human life has had an important surge in the last ten years. It is very powerful and has the potential to infuse changes in different sectors of society. AI is a tool that can be applied in different ways and at different levels. It has been extensively adopted and used in the education sector. Artificial Intelligence (AI) in education has the potential to be a game-changer for every student and teacher. AI in education has given a completely new perspective of looking at education to teachers, students, parents, and educational institutions as well. This paper aims to present the concept of artificial intelligence (AI), and its impact on education, the prospects and challenges. A qualitative research approach was used in the present study. Mainly secondary data is used in the present study. The data for the study was collected from various research articles, journals, PhD theses and books.

Keywords: *Teachers, students, artificial intelligence, education, technology.*

---

1. INTRODUCTION

The landscape of education is continually changing, and new technologies are becoming more and more prevalent in the classroom. One such technology is Artificial Intelligence (AI). The application of AI in education makes the entire educational system convenient and individualized. The widespread use of technology in education is changing how we learn and teach. AI is such an innovative method for adapting the experiences of various learning groups, teachers, and instructors. According to the National Education Policy 2020, AI should be introduced to and included in the regular education curriculum. AI is being incorporated into the curriculum to improve efficiency, personalize learning, and streamline administrative processes so that teachers have more time and freedom to impart knowledge and flexibility. NEP 2020 asserts that technology, including AI, will fundamentally alter how children learn in schools. However, this requires a significant amount of technological and academic research.

The Prime Minister of India has started several initiatives in honor of NEP 2020's first anniversary. 'AI for All' is one of the major initiatives that was started. AI for All is an online course designed to give every member of the nation a fundamental understanding of artificial intelligence (AI). It is obtainable in eleven different vernacular languages. A student, a parent who stays at home, a professional in any sector, or even an elderly citizen can benefit from this four-hour, self-paced, micro-learning program.

2. MEANING OF ARTIFICIAL INTELLIGENCE

Artificial intelligence (AI) is the impersonation of human knowledge procedures, for example, discourse and visual acknowledgment, interpretation of the dialects and virtual decision making by machines and robots. The capacity of machines to think and act like people has given AI an extraordinary place in all fields. Artificial intelligence is available wherever in different parts of our lives beginning from smart sensors to individual associates.

3. REVIEW OF LITERATURE

Borchetia1, B. & Hazarika, M. (2024) in their research entitled "Artificial Intelligence in Education: An Overview" explained in order to develop innovative teaching and learning strategies in the field of education, artificial intelligence is now being made an effort in a variety of educational settings. AI is being applied to

examine enormous quantities of data to find trends and insights that might guide the creation of new educational policies and plans. The paper discussed the need of AI in the field of education and pointed out the different challenges therein. An attempt has also been made to explore AI from the perspective of NEP 2020.

Jamal, Afiya (2023) in paper titled "The role of Artificial Intelligence (AI) in Teacher Education: Opportunities and Challenges" aimed to investigate the role of AI in teacher education, including its potential benefits, drawbacks, and challenges. The paper explores how AI can improve the quality of teacher education, enhance teachers' skills, and facilitate personalized learning. The research also highlights the ethical, social, and cultural implications of AI in teacher education. The paper concludes that AI has the potential to transform teacher education, but it requires careful implementation and ethical considerations.

Khan, M.A. (2023) studied "Artificial Intelligence (AI) in Education: Need of the Hour". In this paper, the researcher has discussed teaching AI, and the different objectives of AI-integrated learning.

Yesmin, H. & Alom, A. (2022) in their article titled "A study on Artificial Intelligence and its impact on Education" explained that Artificial Intelligence (AI) in education has the potential to be a game-changer for every student and teacher. AI in education has given a completely new perspective of looking at education to teachers, students, parents, and educational institutions as well. The paper aimed to present the concept of artificial intelligence (AI), and its impact on education. Especially it represents the impact of AI on students and teachers.

Khan, M.A. (2021) wrote an article entitled "Artificial Intelligence (AI) & Education Developing Adaptable Learning Opportunities among Teachers & Learners" where the researcher discussed on meaning of AI and its necessity and role in the field of Education, and also various challenges of AI. The study also revealed the impact of AI on Education in India.

Chen. L. et. al., (2020) made a study on artificial intelligence in education. In this paper, the researchers have analyzed the nature and technical aspects of AI in education. The study also discussed the role of AI in education as well as its impact on education.

Kengam, J. (2020) made a study on "Artificial Intelligence in Education" where the impact of AI on education as well as its benefits and drawbacks are discussed. The study has also discussed the effects of AI in education after describing a specific method for creating platforms for learning that are AI-enabled.

Jain, S. & Jain, R. (2019) made an empirical study on the role of artificial intelligence in higher education. The results of the study reveal that integrating AI into higher education institutions significantly enhances the capacity of learners for learning and that AI has a bright future in the sector of higher education.

Kumar, Vineet (2018) suggested that AI can be deployed to improve teacher effectiveness and student engagement by offering capabilities such as intelligent game base- based learning environment, tutoring systems and intelligent narrative technologies.

4. OBJECTIVES OF THE STUDY
- To understand the concept of AI
- To study the role of AI in Education.
- To find out the different challenges of AI in Education.

5. METHODOLOGY
This is a qualitative study and is based on secondary sources of information obtained by reviewing various articles on Artificial Intelligence (AI). Articles in journals, newspapers, books, government sites and other internet resources have been the base for developing this research paper.

6. ROLE OF ARTIFICIAL INTELLIGENCE IN EDUCATION
Many research works demonstrate that in higher education, artificial intelligence is important for teachers and students because application of such technologies encourages more flexible learning solutions for students without any limitation. With the help of artificial intelligence universities around the world enrolling increased number of students due to increased flexibility and speed. However, its implementation in teaching has also proven relatively expensive but when compared with the other manual work-related costs it comes out as economical. Though, use of artificial intelligence in the long run among college students is far more cost effective compared to education being conducted in a more traditional way and tasks done manually. Developed countries of the world have already implemented the process of artificial intelligence successfully. However, developing countries are still at

a preliminary stage compared to developed countries in artificial intelligence implementation. Weak infrastructure, poor information access, lack of support from institutes, insufficient necessary resources, poor technological skills, these are various obstacles for developing countries wanting to implement artificial intelligence as a tool in higher education. AI is used in the education system in grading, in this process teachers can mechanize grading of students for certain fixed set of questions. AI can also be applied in adaptive and individualized learning to fulfil students' requirements. AI assists the teachers to access the understanding capacity of the students on their lectures and empower them to give the appropriate clues for students. It works as a teacher for the students and makes them learn concepts easily.

7. BENEFITS OF ARTIFICIAL INTELLIGENCE IN EDUCATION

7.1 Personalized Learning

It is widely accepted that adapting the teaching and learning process to each student's characteristics, needs, and interests is important to improving their motivation, engagement, understanding, and academic performance. However, advancing personalized learning is one of the most significant challenges in education. Even in countries at the forefront of education, classrooms are so big that educators don't have the time to focus on every student's needs. Equally, education materials typically follow a one-size-fits-all fashion, which often fails to engage part of the students.

Against this backdrop, generative AI is regarded as a pivotal technology that enables personalized learning. By analyzing huge amounts of student data, generative AI tools can identify student's strengths and weaknesses, creating new personalized content and assignments to meet their individual needs.

This information is valuable not only for AI assistants to create tailored content but also for educators, who can identify students' potential struggles and thereby help them design their lessons.

7.2 Enhanced Engagement

Closely related to the previous section, generative AI can also be an effective technology to enhance student engagement. Every student is different, and the traditional one-size-fits-all curriculum may not suit some. It's not only about their level but also about their preferences and learning styles.

With generative AI, students could ideally get precisely what they need to enjoy the day in the classroom and increase their engagement—videos and images instead of text, practice instead of theory, and quizzes instead of long assignments. The possibilities are endless.

7.3 Education for Everyone

Generative AI has the potential to democratize education, making learning opportunities accessible to students who would otherwise encounter obstacles.

AI can be particularly effective in highly diverse classrooms with students of different backgrounds, economic status, and languages. By assisting educators in providing personalized, adaptive learning experiences to all students, generative AI can be central to fostering an inclusive and accessible learning environment.

7.4 Administrative Efficiency

The daily life of educators expands beyond teaching. It also involves many administrative, time-and-energy-consuming tasks, including grading assignments and exams, preparing materials and lessons, filling forms, and writing reports.

Generative AI can streamline and speed up some of these tasks, allowing teachers to work less and devote more attention to students' needs.

7.5 Supporting Creativity and Critical Thinking

Generative AI can be a valuable tool for enhancing students' potential. By creating complex, unconventional scenarios in all kinds of disciplines (from math and history to arts and music), generative AI can challenge student's existing perspectives, prompting them to think critically to solve these problems.

For creativity, generative AI tools can work as effective assistants in tasks like story drafting and image, video, or music generation. If used wisely, they are particularly suitable to boost intellectual creativity, help students at the beginning of their journey in a certain discipline, and overcome obstacles during creative processes, like mental blocks.

7.6 Improving the Quality of Teacher Education

AI can play a crucial role in improving the quality of teacher education. Artificial intelligence is becoming an integral part of smart ICT based apps targeted for digital learning in India. One of the significant challenges in teacher education is ensuring that teachers have a strong foundation in the subject matter they teach. AI can provide teachers with access to high quality educational resources and learning materials that are tailored to their individual needs. AI can also help teachers identify knowledge gaps and provide feedback on areas where they need improvement. Teachers can seek the help of AI to improve their teaching skills.

7.7 Enhancing Teachers' Skills

 AI can also enhance teachers' skills by providing them with access to a range of tools and resources that can help them become better educators. For example, AI-powered assessment tools can provide teachers with real-time feedback on student performance, enabling them to adjust their teaching strategies to better meet the needs of their students. AI can also help teachers to personalize learning, creating lessons that are tailored to the individual needs of their students.

7.8 Continuous Professional Development

National Educational Policy 2020 has emphasized the professional development of teachers. AI can provide opportunities for continuous professional development for teachers in many ways. For example, AI systems can provide feedback on teacher performance, highlighting areas where they may need further development. Additionally, AI systems can provide recommendations for professional development opportunities that are tailored to the specific needs of individual teachers.
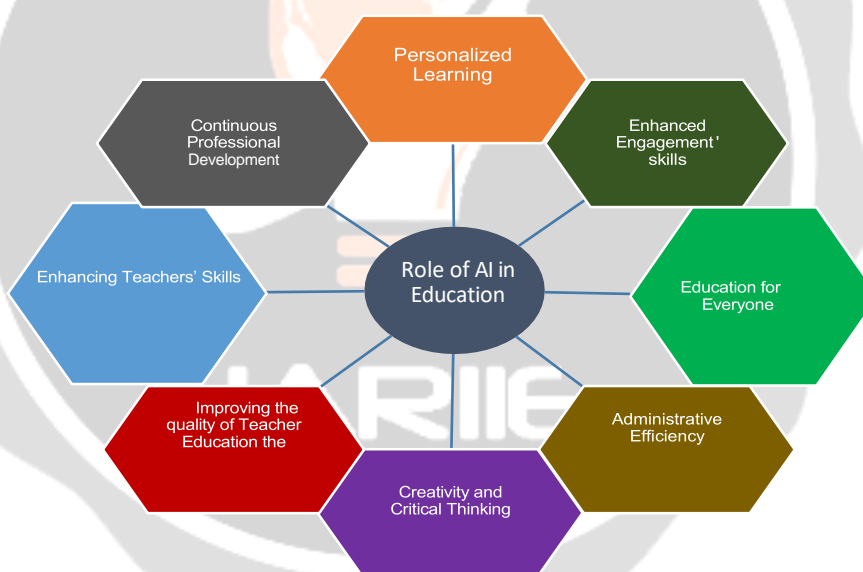

Fig -1: Benefits of Artificial Intelligence In Education

8. NEGATIVE IMAPACT OF USE OF ARTIFICIAL INTELLIGENCE IN EDUCATION

Table -1: Negative Impact of Use of Artificial Intelligence In Education Name of the Table

Category	Description	Potential consequences
Over-reliance	Dependence on AI for tasks that students should learn to perform themselves.	Reduced problem-solving skills, lack of critical thinking

Misinformation and bias	Risk of AI generating incorrect, biased, or harmful content.	Spread of misinformation, perpetuation of stereotypes
Loss of human interaction	Reduced opportunities for social learning and relationship building.	Weakened social skills, isolation
Academic integrity	Challenges in ensuring students submit original work.	Increase in plagiarism, difficulty in assessing true understanding
Digital divide	Inequitable access to AI tools among students of different socioeconomic backgrounds.	Widening educational inequalities

Source: https://www.datacamp.com/blog/ai-in-education

9. CONCLUSION

Artificial intelligence and its uses in our lives are growing day by day in many segments. Artificial Intelligence has the potential to make everyone's life easier through automation. In the field of education, AI has started showing its influence and working as a helping tool for both the students and teachers and supporting the learning process. AI programs are substituting types of classroom instruction by providing support for students to learn from anywhere in the world at any time. AI can be used as an educational tool that guides students toward their goals by providing personalized feedback on homework, quizzes, etc. With the help of AI, students can make their future bright. AI provides students with practical or experiential learning experiences, particularly when used together with other technologies, such as virtual reality, 3-D, gaming, and simulation, thereby improving the students' learning experiences. Overall, AI has had a major impact on education, particularly, on administration, instruction, and learning areas of the education sector or within the context of individual learning institutions. Teachers and students using AI can achieve greater outcomes.

10. REFERENCES

1. Borchetia, B. &, Hazarika, M. (2024). Artificial Intelligence in Education: An Overview, Journal of Emerging Technologies and Innovative Research (JETIR), 11(2), 424-428.
2. Jamal, Afiya. (2023). The Role of Artificial Intelligence (AI) In Teacher Education: Opportunities & Challenges, International Journal of Research and Analytical Reviews (IJRAR), 10(1), 139-146.
3. Celik, I., Dindar, M., Muukkonen, H., & Jarvela, S. (2022). The promises and challenges of artificial intelligence for teachers: A systematic review of research. Tech Trends, 66(4), 616-630.
4. Yesmin, H. & Alom, A. (2022) Study on Artificial Intelligence and Its Impact on Education, International Journal of Food and Nutritional Sciences, 11(3), 1384-1389.
5. Chen, X., Zou, D., Xie, H., Cheng, G., & Liu, C. (2022). Two decades of artificial intelligence in education. Educational Technology & Society, 25(1), 28-47.
6. Jain, S. & Jain, R. (2019). Role 0f Artificial Intelligence In Higher Education- An Empirical Investigation, International Journal of Research and Analytical Reviews (IJRAR), 6(2), 144-150.
7. Kumar, Vineet. (2018). Role of Artificial Intelligence in Education systems, its challenges and opportunities in India, International Journal of Creative Research Thoughts (IJCRT), 6(1), 668-671.
8. Siau K. (2018), Education in the Age of Artificial Intelligence: How will Technology Shape Learning? The Global Analyst, 7(3), 22-24.
9. https://www.datacamp.com/blog/ai-in-education
10. https://ijte.net/index.php/ijte/article/view/600