International Journal of Advance and Applied Research
www.ijaar.co.in
ISSN – 2347-7075 Impact Factor – 8.141
Peer Reviewed Bi-Monthly
Vol. 6 No. 22 March - April - 2025

Role of Artificial Intelligence in Education: An Overview

Dr. Sanvidhan Suresh Sonawane
Assistant Professor, M. U. College of Commerce, Pimpri
Corresponding Author – Dr. Sanvidhan Suresh Sonawane
DOI - 10.5281/zenodo.15543284

Abstract:

Indeed though no one knows how AI will shape the future, we can each agree on one thing AI is one of the most important technologies in the world right now. It's formerly impacting everything from how we date online to what we buy. But how will artificial intelligence affect the future? What will the outgrowth be? An endless class of people who cannot find work because their jobs have been automated. A frugality where super-intelligent computers contend to one day take over the earth. What's passing to people, how do we transfigure and acclimatize our education systems to be harmonious with the digital age? According to exploration, by themid-2030s, one third of all workers will be exposed to the threat of being automated, and the labor force member most likely to be affected is people with a low position of education. Education can change everything in the sense that mortal logic will continue to be necessary, at least at every position and in all diligence. Rather of "humans or computers," the challenge for all- round education should be added up as "humans and computers engaged in sophisticated systems that promote assiduity and wealth."

Keywords: Artificial Intelligence, Education, Technology, Computers, Tech Skills, Future Professions

Introduction:

Education is a vital aspect of human civilization, with the evolution of literacy systems and the rise of online platforms. The ultramodern education system has replaced traditional classrooms, allowing more scholars and preceptors to share technology-based literacy. Online education offers benefits such as inflexibility, lower costs, and a wide range of content. Artificial Intelligence (AI) has significantly impacted various fields, including education, and has the potential to transform the tutoring and literacy process. AI refers to the development of systems and machines that can mimic human intelligence, such as literacy, logic, and problem-solving. It uses algorithms and complex models to enable machines to learn and improve their performance autonomously. AI's primary purpose is to enable machines to display traits specific to human intelligence. One of the key aspects of AI is its ability to learn from experience and data, identify patterns, and improve over time. It uses machine literacy algorithms and artificial neural networks to reuse information, identify patterns, and make predictions. AI also excels in logic, using rules and algorithms to dissect data and generate results. AI can be classified into two main orders: weak AI, designed for specific tasks, and strong AI, which focuses on general cognitive skills and problem-solving abilities across various disciplines. In conclusion, AI refers to the development of systems and machines that can mimic human intelligence and use algorithms and complex models to learn, adapt, and improve their performance independently.

Usage of AI in Education:

Artificial Intelligence (AI) is increasingly being used in education to improve literacy skills and enhance the assessment process. AI can personalize literacy content, provide instant feedback, and improve assessment effectiveness. It can be integrated into online literacy platforms, allowing content and conditioning to be customized according to each student's needs and knowledge position. AI can also automate tasks such as grading assignments, providing feedback on work, and detecting plagiarism. AI can also be trained to detect patterns and estimate student responses in various subjects, helping preceptors save time and provide comprehensive feedback on their students' performance. By analyzing data about student performance, AI can provide valuable insights into individual performance and make predictions about a student's success or failure. This can help preceptors and institutions make informed decisions and provide support through early intervention. AI can also automate repetitive tasks in schools, such as scheduling, cataloging classes, marking attendance, and managing large data sets. It can also automate tasks like managing the demesne, monitoring water and energy consumption, and controlling heating or air usage. However, there are challenges associated with AI's widespread use, such as data security, lack of human commerce, and the need for transparency and clear explanations of decision-making processes. Despite these challenges, AI offers numerous benefits to education, including improved literacy, personalized learning, and improved efficiency.

Research Method:

This study employs a semi-systematic literature review to analyze research results related to the topic of AI in education. It uses a metanarrative approach similar to qualitative research, identifying patterns and themes from relevant research results. The data is sourced from Google Scholar and selected based on themes, titles, content, and research quality reacted to AI in education. After analyzing various research articles few of them were selected for this study as they have meet the selection criteria for this research work.

Analysis and Discussion:

Opportunities with AI:

AI implementation in education offers new ways to deliver learning materials, making it easier for teachers to deliver material effectively and for students to absorb information. This approach can be applied across various fields, including science, psychology, health education, language, art, and mathematics. AI features can create adaptive learning, providing support and feedback, and intelligent tools for students to access all learning needs. Teachers can also use AI's convenience, such as facial recognition systems and predictive analytics, to optimize the learning process. AI integration with learning models like project-based learning, collaborative learning, blended learning, problem-based learning, and mobile learning can maximize learning outcomes, such as motivation, academic performance, achievement, behavior, creativity, and problem-solving. Learning robots can also provide meaningful experiences for students. Integrating AI in learning evaluation activities can improve effectiveness. AI features like automated assessment systems, image recognition, computer visions, and prediction systems can support evaluations. Artificial neural networks provide convenience in academic performance analysis. Objective-oriented assessments focus on objects, eliminating subjectivity and allowing for better mapping of student achievements and needs. This approach allows for appropriate actions based on student needs. In the era of

information technology, AI can be integrated into learning management systems to adapt to the latest learning needs. Smart school concepts, such as face recognition, speech recognition, virtual labs, and hearing and sensing technologies, can be integrated with AI. These systems can facilitate online and mobile remote education, achieving modern management principles like autonomy, adaptability, and interactivity. AI also offers advantages like calculability, measurability, and represent ability, which can support the creation of effective and efficient learning management systems. AI's collaboration with education has transformed technical learning, management, policy-making, educational markets, and student literacy. AI can act as policy advisors, providing materials and information to create accurate education policies. The development of educational markets is also influenced by AI's role. AI literacy aims to improve student literacy through AI concepts, evaluation, and understanding concepts. Additionally, AI's role in education research trends includes data mining, intelligent tutoring, artificial neural networks, and knowledge connection. Overall, AI plays a crucial role in achieving educational goals through delivery of learning materials, evaluation, and learning management systems.

Challenges:

The integration of AI in education presents both Pros and Cons. The first challenge is AI ethics, which involves issues such as bias, automation, morality, privacy, fairness, and transparency. To address these, practitioners and policymakers must create comprehensive public policies and ethical pedagogical choices that align with human principles, values, legal systems, and inclusion and equity in education. The second challenge is designing pedagogical concepts that align with epistemology, ethics, truth, and individual and collective responsibility. Preparing educators to adapt to AI development and support the creation of ideal pedagogical concepts is also crucial. The third challenge is technical learning, including systems, frameworks, models, approaches, and guidelines for implementing frameworks. Collaboration between educators, policy-makers, and professionals is essential for achieving the AI revolution in ideal education. The fourth challenge is embedding AI in students' everyday lives, supporting their cultures, goals, and educational targets. Curriculum design must be adjusted to AI development and features, prioritizing AI literacy targets in students, as literacy is the foundation for mastering various competencies.

Threats:

AI's benefits in the educational process can be accompanied by potential threats. These threats can be direct, affecting teacher, student, and policy-makers' privacy, with students being particularly vulnerable. They can be compromised through data exploitation, misuse of personal data, and inferred emotional states. ChatGPT, a widely used AI feature, can generate acceptable text but also poses a risk of plagiarism. Teachers' roles are also being depleted, as they are being relegated from educators to facilitators, focusing on material delivery and evaluation without considering affective elements. These threats can lead to a depletion of ethical elements in education. Therefore, it is crucial to monitor and address these threats to ensure the safety and effectiveness of the educational process.

Difficulties:

The integration of AI in education faces several challenges, including high costs, limited teacher training, and slow curriculum and structural changes due to fundamental aspects of education, as well as the need for professional development.

Futuristic view on Artificial Intelligence:

Artificial intelligence (AI) is transforming various occupations, including

automation, decision assistance, and the creation of new jobs. Automation reduces the demand for human labor, with robots and collaborative robot systems taking over repetitive tasks in the manufacturing industry. AI can also support decision-making by providing real-time analytics and insights, allowing for personalized recommendations and solutions in areas like health, finance, or marketing. As AI advances, some occupations may become obsolete, while others may be transformed. For example, in medical services, AI can take over tasks like analyzing medical images or interpreting patient data, allowing healthcare professionals to focus on more complex aspects. This transformation necessitates continuous learning and digital skill development to adapt to technological changes and find new employment opportunities in the digitized economy. Adapting education to changing occupations is crucial to prepare the future workforce to face the demands and challenges brought by technological development and AI.

Conclusion:

The study highlights both the potential of artificial intelligence (AI) in education and the accompanying challenges and risks. Opportunities stem from its ability to enhance learning material delivery, evaluation, and management, as well as inform educational policy. However, challenges such as pedagogical adaptation, educational frameworks, and literacy must be addressed. Additionally, concerns involving data security and ethical implications present threats, while high costs, insufficient teacher training, and slow curriculum evolution act as obstacles to AI adoption. Despite these issues, AI presents promising prospects for personalized and accessible learning experiences that can revolutionize education. By tailoring education to individual needs, fostering collaboration among students, and enhancing creative problem-solving abilities, AI has the potential to reshape educational environments in alignment with the demands of a digital future.

References:

1. F. Ouyang and P. Jiao, “Artificial intelligence in education: The three paradigms,” *Comput. Educ. Artif. Intell.*, vol. 2, no. March, pp. 2–6, 2021, doi:10.1016/j.caeai.2021.100020.
2. Coșman, Oana. 2021. „Universal Robots: What are collaborative robots and how can we work alongside them.”
3. https://zoom.vodafone.ro/universal-robots-ce-sunt-robotii-colaborativi-si-cum-putem-lucraalaturi-de-ei/
4. Mahendra, Sanksshep. 2023. „How is AI Being Used in Education.”
5. https://www.aiplusinfo.com/blog/how-is-ai-being-used-in-education/
6. V. Dignum, “The role and challenges of education for responsible ai,” *London Rev. Educ.*, vol. 19, no. 1, pp. 1–11, 2021, doi: 10.14324/LRE.19.1.01.
7. Vimal, Daga. 2022. „Impact of AI on future job roles.” *The times of India.*
8. https://timesofindia.indiatimes.com/blogs/voices/impact-of-ai-on-future-job-roles/.
9. J. Borenstein and A. Howard, “Emerging challenges in AI and the need for AI ethics education,” *AI Ethics*, vol. 1, no. 1, pp. 61–65, 2021, doi:10.1007/s43681-020-00002-7
10. X. Chen, H. Xie, D. Zou, and G. J. Hwang, “Application and theory gaps during the rise of artificial intelligence in education,” *Comput. Educ. Artif. Intell.*, vol. 1, no. August, p. 100002, 2020, doi: 10.1016/j.caeai.2020.100002.
11. L. Chen, P. Chen, and Z. Lin, “Artificial intelligence in education: A

review," *IEEE Access*, vol. 8, pp. 75264–75278, 2020, doi:10.1109/ACCESS.2020.2988510.

12. G. J. Hwang, H. Xie, B. W. Wah, and D. Gašević, "Vision, challenges, roles and research issues of Artificial Intelligence in Education," *Comput. Educ. Artif. Intell.*, vol. 1, pp. 1–5, 2020, doi: 10.1016/j.caeai.2020.100001.
13. T. Talan, "Artificial intelligence in education: A bibliometric study," *Int. J. Res. Educ. Sci.*, vol. 7, no. 3, pp. 822–837, 2021, doi: 10.46328/ijres.2409.
14. O. Zawacki-Richter, V. I. Marín, M. Bond, and F. Gouverneur, "Systematic review of research on artificial intelligence applications in higher education – where are the educators?," *Int. J. Educ. Technol. High. Educ.*, vol. 16, no. 1, pp. 1–27, 2019, doi: 10.1186/s41239-019-0171-0.