Prof. A.P. Sharma
Founder Editor, CIJE
(25.12.1932 - 09.01.2019)

Role of Artificial Intelligence (AI) in School Education

Soney Kumari
Research Scholar
Dr. Mahesh Kumar Gangal
Associate Professor
Department of Education, Banasthali Vidyapith,Tonk, Rajasthan
Email-soneykumari12@gmail.com, Mobile-8447959084

Abstract

This paper providing a role of Artificial Intelligence (AI) is transforming school education by enhancing teaching methods by offering personalized learning, automated feedback, Virtual assistants, Predictive Analytics, Administrative support and simulated classroom management systems. While AI brings numerous benefits, such as improved learning outcomes and administrative efficiency, its implementation also raises significant concerns related to data privacy, bias algorithmic and fairness, and emotional well-being. These technologies have the potential to significantly enhance educational outcomes and operational efficiency. However, these advancements are accompanied by critical concerns related to security and insecurity. Challenges such as a data privacy and protection, bias in algorithmic, over-reliance on technology, improved security and assessment integrity.

This paper providing a potential uses, benefits of artificial intelligence (AI) tools in school education as well as the new challenges of security and insecurity. In addition, AI can provide in school education as well as the necessity of ethical guidelines, transparent AI systems, and balanced human-AI interaction to ensure that technology improves education without making adjustment the feeling of security within the school environment.

Key words *: Artificial intelligence, National educational policy-2020, AI in school education, security and insecurity, challenges etc.*

Introduction

Artificial Intelligence is fast becoming a part of modern school education, transforming the way students learn, the way teachers teach, and the way schools operate. AI tools like virtual tutoring applications, automated assessments, and predictive analytics enable personalized learning paths and real-time feedback, transforming how education is delivered and experienced. However, the integration of these technologies also brings forth significant concerns related to data security, student privacy, algorithmic bias, and the psychological effects of surveillance. As educational institutions adopt AI-driven solutions, it is crucial to ensure that these advancements are implemented ethically and security, safeguarding the well-being and rights of all stakeholders involved.

Under the NEP-2020 framework, Artificial Intelligence offers numerous opportunities to improve the education system, but it also presents several significant challenges. Key concerns include ethical implications, data protection, and privacy, fairness, teacher training and preparedness, as well as limitations infrastructure are a few of these challenges. The policy related reports provide in-depth discussions about each issue, offering valuable insights into the complexities, possible challenges linked to adopting AI in schools.

This article discusses the dual function of AI in education at school. This article discusses the dual function of AI in education at school, its potential application and the new challenges of security and insecurity.
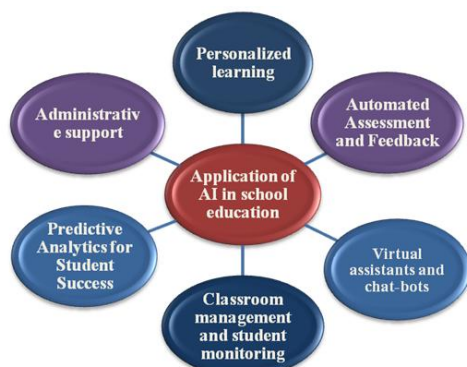
Artificial Intelligence (AI)

John McCarthy introduced the term Artificial Intelligence in 1956 during a two-month workshop at Dartmouth College, USA (Zawacki-Richter et al., 2019). AI referred to as machine intelligence, enables computer systems mimics human intelligence. such as learning, problem-solving, language comprehension, pattern recognition, and decision-making. These systems using a function advanced algorithms and data processing techniques, allowing machines to mimic human cognitive abilities. AI has a wide range of applications,

Soney Kumari
Dr. Mahesh Kumar Gangal

from virtual assistants like Siri and Alexa to self-driving cars and intelligent healthcare technologies.

In the context of education, AI is being increasingly adopted to enhance learning experiences and administrative efficiency. The **National Education Policy 2020 (NEP-2020)** emphasizes the integration of emerging technologies like AI in the school curriculum and administration to improve the quality of education, promote personalized learning, and equip students with future-ready digital skills. While AI offers tremendous opportunities, it also introduces ethical, privacy, and security concerns that need to be tackled to promote its responsible application, particularly within the education sector.

Application of AI in School Education

The use of Artificial Intelligence (AI) in school education is transforming traditional teaching and learning methods. With AI tools being integrated into classrooms and administrative systems, schools are witnessing a significant shift in how instruction is delivered, student progress is monitored, and operations are managed. AI enhances the learning experience by enabling personalized instruction, automating assessments, and supporting teachers with data-driven insights. **The National Education Policy- 2020** acknowledges the transformative potential of AI in education and encourages its adoption to improve teaching practices, customize learning for individual student needs, and increase overall learning outcomes.

AI technologies are being used in various ways to improve education at the school level:

Personalized learning: Artificial Intelligence can adapt education content based on individual student by adjusting content to match each student's learning speed, interests, and academic level. These AI systems track student performance continuously and adapt lessons to strength a weak areas or introduce more challenging material where appropriate. This personalized approach supports varied learning abilities and fosters a more inclusive classroom environment.

Automated Assessment and Feedback: AI technologies are capable of grading various types of assessments, including multiple-choice questions and more complex written responses, with high accuracy. These tools offer instant feedback, allowing students to quickly recognize their errors and enhance their comprehension. This not only saves teachers time by automating the grading process but also allows them to dedicate more time to tailoring lessons to meet the specific needs of their students.

Virtual assistants and chat-bots: AI-based chat-bots and voice assistants serve as accessible, on-demand educational tools that help students with various academic tasks. These tools can guide students with homework, clarify concepts from lessons, and offer explanations beyond regular school hours. These virtual assistants offer 24/7 support, ensuring that students receive continuous learning assistance, particularly when teachers or tutors are unavailable. This feature is particularly helpful for students who may not have access to extra help at home, ensuring that learning doesn't stop when school ends. Furthermore, AI assistants can personalize their support, adapting to each student's learning style, strengths, and challenges, fostering a more inclusive and individualized learning experience.

Classroom management and student monitoring: AI technologies such as facial recognition, behavioral tracking, and attention-monitoring tools can assist educators in recognizing students who may be disengaged, distracted, or showing signs of emotional distress. These systems support teachers in maintaining a focused and supportive classroom environment. Additionally, These systems also help ensure classroom discipline and student safety.

Predictive Analytics for Student Success: Artificial intelligence can analyze student information—like attendance patterns, grades, and behavioural tends—to identify learners who are potentially at risk of failing school or dropping out. By catching these these warning signs early, educators and school counsellors provide proactively special support and intervention, keeping students on track and achieving success in their education.

Administrative support: Artificial intelligence can assist in handling everyday class schedules, updating student records, tracking attendance and communication with parents. Automating these routine tasks helps lighten the workload for educators and administrative staff, giving them more time to concentrate on teaching and engaging with students. Moreover, AI can process and manage data quickly and correctly, reducing the likelihood of mistakes and boosting the overall efficiency of school management. The school educational system becomes more effective, well-organized, and responsive educational system.

New Challenges of Security and Insecurity Role of (AI) in School Education

Artificial Intelligence brings numerous advantages to the education system. It's adoption in schools also raises important concerns related to security and ethics. These issues primarily involve safeguarding student data, managing surveillance technologies, ensuring system reliability and protecting the mental and emotional health of students and educators.

Below are some of the key challenges of Security and insecurity role of AI in school education:

Soney Kumari
Dr. Mahesh Kumar Gangal

Data privacy and protection: Artificial Intelligence applications in schools require the collection of large amounts of student-related information, such as academic records, behavioral insights, and personal details. Without strong cyber security measures and well-defined data governance policies, this information is at risk of being accessed or exploited by unauthorized parties. Insufficient data security can compromise student privacy and reduce confidence in school education. As AI becomes more widespread in classrooms and administration, establishing robust data security protocols, conducting regular system evaluations, and maintaining transparency in how student data is used are essential to maintaining a secure and trustworthy educational environment.

Cyber security threats:

Digital technologies are increasingly used in schools. as a result, AI systems connected to schools face an increased risk of cyber attacks. These systems, if not properly secured can become entry points for hackers aiming to access sensitive data or disrupt school operations. To protect students and maintain the integrity of school systems, it is essential to implement comprehensive cyber security measures tailored specifically for AI technologies used in the schools.

Algorithmic Bias and Fairness: Artificial intelligence systems in educational institutions are built on algorithms trained using historical data. If this data contains social or cultural biases, the technology may unintentionally produce biased results—such as misinterpreting the abilities of students from diverse backgrounds. This can result in unfair grading, unequal opportunities to learning opportunities, or inappropriate interventions. To maintain fairness and equity, it's essential to evaluate and update AI tools regularly, ensuring they promote inclusivity and avoid reinforcing existing inequalities.

Ethical concern and Transparency: Ethical concerns and lack of transparency in AI-driven systems in schools present significant challenges. Many AI tools operate as "black boxes," making their decision-making processes difficult for teachers, students, and parents to understand. This can result in biased outcomes and unfair treatment. Additionally, AI systems often require access to sensitive student data, raising concerns about privacy and security. Without clear explanations for AI decisions, it becomes challenging to ensure fairness, accountability, and trust. Therefore, it is crucial to establish ethical guidelines and regulations to ensure AI is used responsibly and fairly in school education.

Over-reliance and technology: Over-reliance on AI tools like facial recognition, behavior tracking, and attention-monitoring systems can lead to an atmosphere of constant surveillance in the classroom. This continuous observation may cause students to feel uneasy or stressed, diminishing their sense of freedom and independence. Over time, such an environment can affect their emotional well-being and discourage active participation in learning activities.

Better security and assessment integrity: Artificial Intelligence can play a vital role in improving school security and maintaining the credibility of academic assessments. By using tools like biometric verification, encrypted login credentials, and automated exam monitoring, AI helps reduce incidents of cheating and restricts unauthorized access to online exams. These intelligent systems are capable of observing test settings in real time and identifying irregular or suspicious behavior. Moreover, AI can analyze student performance trends to detect unusual patterns that might indicate dishonest practices. Such applications promote fairness, accuracy, and accountability in the evaluation process, contributing to a more secure and trustworthy learning environment.

Conclusion

Artificial Intelligence is changing school education by providing advanced tools that support customized learning, streamline assessments, enhance administrative tasks, and provide on-demand academic assistance. These intelligent technologies are reshaping instructional strategies and enabling schools to utilize data more effectively, resulting in improved academic performance and organizational efficiency.

Although, the use of AI into the education system involves considerable challenges and potential risk. Security and ethical challenges such as data privacy, algorithmic bias, lack of transparency, and excessive reliance on technology pose significant threats to student autonomy and institutional trust. To ensure that AI in education ethically and safely supports educational goals, it is necessary to implement strong data governance, establish ethical standards, and conduct regular systems reviews. With a balanced approach, educators and policymakers can harness the benefits of AI while protecting the rights of all learners.

Reference
- Blikstein, P. (2018). Artificial intelligence in education: The promises, challenges, and implications of automated systems in educational settings. *International Journal of Artificial Intelligence in Education, 28*(2), 237–242. https://doi.org/10.1007/s40593-018-0166-z
- Deng, H., Jia, W., & Chai, D. (2022). Discussion on innovative methods of higher teacher education and training based on new artificial intelligence. *Security and Communication Networks, 2022*, 1–10. https://doi.org/10.1155/2022/3899413
- Ministry of Education, Government of India. (2020). *National Education Policy 2020*. from https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf
- Blikstein, P. (2018). Artificial intelligence in education: The promises, challenges, and implications of automated systems in educational settings. *International Journal of Artificial Intelligence in Education, 28*(2), 237–242. https://doi.org/10.1007/s40593-018-0166-z
- Mhlanga, D. (2023). Open AI in education, the responsible and ethical use of Chat-GPT towards lifelong learning. *SSRN Electronic Journal.* https://doi.org/10.2139/ssrn.4354422
- Queiroz, V., Simonette, M., & Spina, E. (2022). Artificial intelligence and education: Myth and facts (p. 1001). https://doi.org/10.21125/edulearn.2022.0278
- Russell, S., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4th ed.). Pearson Education.
- Salas-Pilco, S. Z., Xiao, K., & Hu, X. (2022). Artificial intelligence and learning analytics in teacher education: A systematic review. *Education*

Soney Kumari
Dr. Mahesh Kumar Gangal

Sciences, 12(8), 569. https://doi.org/10.3390/edu csci 12080569

- Kumari, S., & Gangal, M.K. (2025). Role of artificial intelligence and Meta-verse in teacher education. *Leveraging potential of AI in education* (International Conference, JICE).VL Media Solutions.

- Top 7 ways artificial **i**ntelligence is used in education. (n.d.). *Training Magazine.* Retrieved February 15, 2023, from https://trainingmag.com/top-7-ways-artificial-intelligence-is-used-in-education/

- Tyagi, S., & Banerjee, S. (2023). *Exploring the integration of artificial intelligence in the implementation of India's National Education Policy 2020: Challenges and prospects*. Research-Gate.

- University of San Diego. (n.d.). *Examples of how artificial intelligence is transforming education*. Retrieved from https://onlinedegrees.sandiego.edu/artificial-intelligence

- Wadhwa, D. (n.d.). Using artificial intelligence technologies for personalized learning and responsive teaching: A survey.