

Evolving Landscape of AI in Education: Exploring Opportunities and Threats

Md. Ashique Husain¹

Research Scholar, Department of Teacher Training and Non-Formal Education (IASE)
Jamia Millia Islamia, New Delhi-110025
ashiquerazzaque88@gmail.com

Warda Firdaus²

Research Scholar, Dept. of Education & Training
Maulana Azad National Urdu University, Hyderabad
wardafirdaus15@gmail.com²

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ABSTRACT

Today due to the implication artificial intelligence the nature of education has undergone changed. The integration of artificial intelligence (AI) into education provides an opportunity to enhance learning experiences, make the teaching and learning process enjoyable, manage acquisition, personalize instruction and improve administrative processes. AI technologies, such as intelligent tutoring systems, adaptive learning platforms, and automated grading systems, offer the ability to meet the individual needs of students, providing tailored support and feedback that can improve learning outcomes. Moreover, AI can help teachers by reducing the administrative burden, allowing them to focus more on direct student interaction and innovative teaching strategies. There is no doubt that the application of AI in education offers opportunities, but with its excessive and careless application in education, there are also some threats that need to be addressed. The study explores the concept of AI (Artificial Intelligence) in Education. The researcher has tried to highlight the threat along with these opportunities through this paper.

Introduction

“This policy has been formulated at a time when an unquestionably disruptive technology - Artificial Intelligence (AI) 3D/7D Virtual Reality - has emerged. As the cost of AI-based prediction falls, AI will be able to match or outperform and, therefore, be a valuable aid to even skilled professionals such as doctors in certain predictive tasks. AI's disruptive potential in the workplace is clear, and the education system must be poised to respond quickly” (NEP-2020, PP-57). However, using AI in sphere of education it also raises many concerns about pupil privacy, data safety and security, ethical bias, environmental issues, transparency and encouraging human laziness. This paper explores AI's opportunity and threat in education. “The emergence of technologies such as Artificial Intelligence, Machine Learning, as well as large data analytics and visualization will definitely find innovative applications in the education domain (Pazmino, 2023). There are enormous possibilities to use emerging technologies such as Artificial Intelligence, Machine Learning and Data Science, as well as immersive (AR/VR/virtual labs), interactive, and gamified contents to improve the teaching-learning and assessment processes, supporting Teacher preparation and professional development, enhancing educational access, and streamlining educational planning, management, and administration” (NCFSE-2023, PP-194).

Artificial intelligence is reshaping the landscape of education system. In recent years, there has been growing interest in using AI to extend the optimization of learning outcomes. Students are experiences the wide range of AI in their personalized learning in education, since AI provided a customized way of learning & teaching, there are several AI opportunities in education that may cultivate the need of education in modern era. (Michel, 2023) Students may be benefited to use of AI in their education through tutoring, accelerating learning process, to developing enrich content, learning management etc., (Pazmino, 2023) AI can also improve assessments by providing instant feedback and allowing for a more accurate evaluation of student performance by automating administrative tasks, AI saves teachers valuable time, enabling them to focus on what matters most - teaching. Additionally, AI-powered tools help identify learning gaps, allowing for targeted interventions. Overall, AI has transformed the education landscape, making it more efficient, effective, and student-centered. In the era of digital age and technological advancement, AI tool have potential to revolutionize the education to more innovative way to teaching and learning that refers to easy access, adopt, equitable. (Kareem, 2021)

Despite of all the opportunity and benefit of AI in education, it also raises several concerned about the safe use of AI that directly threat to the pupil that how can safely use the AI? The threat related to personal data, privacy, safety and security, ethical concern, biases and also encouraging human laziness. (Michel, 2023) AI collected large amount of data from different source that data can be misused

or stolen. For example, we all are in the of sphere of technology all students use different type of gadgets like mobile phone, laptop, tablet etc and their gadget they gave allowed access to several application and software, directly this software can easily access the students saved documents also can stolen and misused. In recent time there are several AI developed deep fake videos and images has been viral.(Pazmino, 2023)

Review of related literature:

Saputra, et al., (2023, August), conducted a study on “Integration of Artificial Intelligence in Education: Opportunities, Challenges, Threats and Obstacles. The main purpose of the study was to analyze in depth about the opportunities, challenges, threats and obstacles to the implementation of AI in education. The method of the study was semi-systematic literature review. In this study researcher was design to analysis a number of research result. The analysis method used in this study was a meta narrative approach that includes the process of analyzing, selecting, identifying, recognizing pattern and related topic. The result of the study showed that the Artificial intelligence opportunities in education are related to deliver the learning resources, in the process of assessment and evaluation, management in education system and making of policy and scheme in the sector of education. While challenges are related to educational framework, method of teaching i.e., pedagogy and literacy. Threats was identifying as related to security of data, internet ethics. Obstacles that arose high cost, limited training to the teacher.

Rahman, & watanobe.(2023, May), explored “ChatGPT for Education and Research: Opportunities, Threats, and Strategies”. The study was tried to explore the potential opportunities and threats that ChatGPT poses to education system from the context of students and teachers, also research find out programming learning, that explored how ChatGPT helped students improve their programming skills. The researcher was conducted different coding-related experiment with the help of ChatGPT including code generation from problem descriptions pseudocode generation of algorithm from code correction and texts. To validated the generated code with the help of online judge system to evaluate their accuracy. In addition, researcher was conducted many surveys with teacher and students to find out how ChatGPT help programming language and teaching. The result of the survey and experiment showed that ChatGPT is useful for programming, education and research. It also showed that ChatGPT had certain limitation and threats like ethical implication, misuse of technology and security.

Pazmiño, &M., (2023)Explored “Artificial Intelligence in Education: Exploring the Potential Benefits and Risks” The main objective of this paper was to explore AI's potential benefits and risks in education, including personalized learning, improved assessment, reduced planning time for teachers, and the risk

of cheating. In this research paper researcher used several research results and interpreted it on the basis of rationalization. This paper finds out one approach to mitigating the risk of using AI in education system is designing task that requires creativity, critical thinking and problem-solving skills. One main challenge that identified was digital divide in education.

Naklas,&Mozelius(2019)Conducted a study on “Artificial Intelligence in education: a promise, threat or hype”. The main purpose of the study was to analyses and discussed AIED from the teacher perspective. This study was carried out with the help of SWOT analysis and the data was collected from literature review, main keywords in the literature search were: AI, AI in education, AIED, education &teacher, Teacher perspective and also pattern and then had classified into four categories and processed with deductive and inductive thematic analysis. Finding of the study that was indicated that there are both promises and threats for the teacher in the modern AIED. In many aspects the education filed seems to be in a position of hype but if we look into other hype areas there was a potential for maturing and with concrete applications in regular teaching and learning activities.

Denecke, et al.,(2023, December), conducted research on “Assessing the Potential and Risks of AI-Based Tools in Higher Education: Results from a survey and SWOT Analysis”. The main purpose of the paper was to identify the strengths, weaknesses, opportunities and threats (SWOT) of used AI-based tools (ABTs) in higher education contexts. A mixed methods approach was carried out to achieve the intended objectives; researcher conducted a survey and used the results to perform a SWOT analysis. For the survey, researcher asked lecturers and students to answer 27 questions based on Likert scale, free text, etc. on their experiences and viewpoints related to Artificial intelligence-based tools in higher education. Sample size of the study consisted 305 people from different countries and with different backgrounds answered the questionnaire. The results of the study showed that a moderate to high future impact of ABTs on teaching, learning and exams is expected by the students. ABT strengths were shown as the personalization of the learning experience or increased efficiency. Main Challenge related to skills teaching, data safeguard and bias. Researcher concluded that research is needed to study the unintended consequences of ABT use in higher education in particular for developing countermeasures and to demonstrate the benefits of ABT usage in higher education.

Kareem, et al., (2021) investigate “Promise, Threats, And Personalization in Higher Education with Artificial Intelligence” The main objective of this study was to investigates the emergence of AI in education, including higher education and alternative learning environments. It studied the educational implications of emerging technological advancement such as virtual and augmented reality, on students' learning processes and how educational institutions develop and evolve. This research study laid on

promises and threats of Artificial intelligence in higher education. To achieve the objective of this study research used more than 100 research paper which had addressing the importance and threats of AI in higher education published between 2010 to 2020 had been analyzed. The result of the study revealed that artificial intelligence solutions could change educational administrative services, making things very different for higher education teaching and learning. Many software involves artificial intelligence, including simple tasks that can be automated, but complex jobs beyond that capability have not yet been imagined.

Villarreal, et al.,(2023, August), conducted a study on “Challenges and Opportunities of Generative AI for Higher Education as Explained by ChatGPT” the main purpose of the study was to explored the potential benefits and limitations of ChatGPT, and mitigation strategies for addressing the identified challenges. In addition to examine ChatGPT’s perspective on the opportunities and challenges. To explore the study researcher, adopt a research method called a thing ethnography and applied to Chat GPT based on qualitative approach. This study tried to understand the human perspective in qualitative manner. The findings of the study revealed that the transformative potential of ChatGPT in education, consistent with past studies, while also revealing additional insights. It also demonstrated significant challenges that must be addressed. The study also identified key themes identified during the interview, including opportunities, challenges, barriers, and mitigation strategies.

Farahani, &Ghasmi, (2024, July)conducted a study on “Artificial Intelligence in education: A comprehensive study” The main objective of the study was to show how artificial intelligence in education helps teacher to identify gaps in student knowledge and provided targeted feedback to improve learning outcomes. Researcher used the library method and review of several documents had been used and analyzed. The study also examined the vast range of AI technologies employed in educational system, including intelligent tutoring systems, personalized learning platforms, educational chatbots, and virtual reality simulations. It was demonstrated that how AI-powered analytics and data-driven insights enabled teacher to gain deeper insights into student learning patterns, identify areas for improvement, and tailor instructional strategies accordingly. The result of the study showed thatthe study underscores the profound impact of AI on education and the need for thoughtful implementation strategies that prioritize equity, inclusivity, and ethical considerations. By cultivating the potential of artificial intelligence in education systems can better prepare learners for the challenges and opportunities of the 21st century.

Opportunities: for the identification of opportunities of AI in education researcher has reviewed the several studies related to the same and analyzed those studies on the basis of findings of the several studies researcher has identified below discussed some opportunities.

Personalized based learning

Personalized learning is a learning approach that student can customized their “learning plan” based on their learning style, what they know, and what their skills and interests are. AI-powered personalized learning can help students learn at their own pace. Students can customized their learning style as according to their aptitude, interest, strength, and need.

Tutoring

Tutoring through AI is a computer programs that provide personalized instruction and feedback to students. This programme can adapt to a student's needs, interest, aptitude and create a one-on-one learning experience. AI tutors can help students improve their learning outcomes and learn at their own pace.

Gamified based learning platforms

Gamified is an AI programming learning platform, by the use of gamified as a learning tool, here students become more engaged in learning with their own pace and fun. Students are enjoying by suing gamified and accelerate their learning process. Specially it can more help to the lower grade students as they can learn through fully engagement in learning process

AI in Assessment & Evaluation

It is a greater scope of AI in assessment & evaluation of student’s performance, improve assessments by providing instant feedback, accurate result, transparency and allowing for a more accurate evaluation of student performance. It will reduce the time, resources and other energy, AI can be used in assessment and evaluation system.

To develop quality content

AI can help teachers to develop quality content, traditionally it was a big headache to the teacher to develop enrich content. AI has transformed the content development landscape, enabling the creation of high-quality, engaging, and personalized content with unprecedented efficiency. As AI continues to evolve, its potential to elevate content creation will only grow, revolutionizing the way we communicate and connect with our audiences.

Tailored learning experiences

AI-powered tailored learning experiences revolutionize education by making it more student-centric, efficient, and effective. Every learner receives a unique learning pathway, fostering a more inclusive and successful educational journey.

Learning management system

An AI-powered learning management system (LMS) uses artificial intelligence (AI) to enhance the management and delivery of educational content, learning experiences, feedback and instruction. AI LMS platforms use machine learning programme to analyze learner data and behavior, which can help to create personalized learning style. This can lead to more engaging and relevant learning experiences.

Threats: for the identification of threats of AI in education researcher has reviewed the several studies related to the same and analyzed those studies on the basis of findings of the several studies researcher has identified below discussed some opportunities.

Privacy and Security

The extensive use of student data raises concerns about privacy and security. Ensuring that sensitive information is protected from breaches and misuse is a critical challenge. In the era of AI nothing is impossible so we should have to very concern about the consequences of AI. The strong cyber policy should be made to protect the personal information.

Bias and Fairness

AI systems can perpetuate existing biases if the data they are trained on is biased. This can lead to unfair treatment of certain groups of students, reinforcing inequalities rather than mitigating them and this will lead inferiority to the students so we should have to cater these consequences before implication of AI. We should have proper mitigation strategies to overcome from these biases.

Job Displacement

The automation of tasks traditionally performed by educators and administrative staff may lead to job displacement. While AI can augment human capabilities, there is concern about its impact on employment in the education sector. AI may increase unemployment for future generation. we should have to cater these consequences also.

Digital Divide

Access to AI-powered educational tools requires reliable internet and technology infrastructure. Students in underprivileged or remote areas may be left behind, exacerbating educational inequalities. Many institutions have not good system of technology enabled classroom, unskilled teacher, staff and students are also big challenges.

Over dependency on Technology

There is a risk that over-reliance on AI could undermine the importance of human interaction in education. The role of teachers as mentors and role models cannot be fully replicated by machines. But due to too much dependency students and teachers are going lazy.

Ethical Concerns

The Implication of AI in education raises ethical questions about the extent to which AI should influence educational decisions and the potential for it to be used in ways that are not in the best interests of students.

Conclusion:The integration of AI in education holds immense potential to revolutionize the learning experience, making it more personalized, efficient, and engaging. However, it is crucial to address the associated challenges to ensure that AI benefits all students equitably and ethically. Balancing innovation with careful consideration of privacy, fairness, and human values will be key to harnessing the full potential of AI in education.

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