4th Global Conference on Education
12-14 December 2025 I Dubai, United Arab Emirates

Artificial Intelligence in STEM Education: Challenges, Inequities, and the Need for Responsible Integration

Jelena Ilić
Faculty of Sciences, University of Novi Sad, Serbia

ABSTRACT

The growing role of artificial intelligence in STEM education brings both transformative opportunities and significant challenges. This paper examines the complex risks and unintended consequences associated with the use of artificial intelligence in STEM education. Key issues include the threat of students becoming overly reliant on the generative tools offered by artificial intelligence, inequalities in access to technology, and the loss of critical thinking skills. The PRISMA approach systematically examines these issues via a clear and reproducible analysis of 24 relevant articles. The analysis examines the impact of artificial intelligence on learning outcomes across learning environments, driven by disparities in students' digital literacy and socio-economic background. We identify these parameters as important in shaping students' interactions with AI-based tools. Research shows that, while AI has the potential to promote interaction and provide tailored learning processes, incorporating it into STEM education requires prudence and long-term planning. The study highlights the importance of appropriate pedagogical frameworks, well-defined codes of ethics, and appropriate teacher training initiatives to mitigate potential risks. The lack of these frameworks can lead to AI widening the gap between inequalities and hindering the development of essential cognitive and problem-solving skills rather than helping them. This paper strongly recommends a fair and cautious approach to incorporating AI into STEM education – the dual role of AI as an enabler of innovation and a future disruptor. By recognising this dual role, educators are better able to develop safe and productive AI-based learning environments that truly promote student growth and align with long-term learning goals.

Keywords: Artificial Intelligence in Education; Critical thinking; Ethical Challenges; STEM Education