

TRANSFORMING ALGEBRA LEARNING IN THE ERA OF ARTIFICIAL INTELLIGENCE

Sri Asih Agustin

Universitas Sultan Muhammad Syafiuddin Sambas, Indonesia
Email: Sriasih.agustin97@gmail.com

Abstract

The rapid advancement of Artificial Intelligence (AI) has significantly transformed educational practices, including the teaching and learning of algebra. This study aims to examine how AI-driven technologies reshape algebra learning by enhancing conceptual understanding, problem-solving skills, learning personalization, and instructional effectiveness. The research employs a literature review approach by synthesizing findings from recent peer-reviewed international publications, conference proceedings, and authoritative educational reports focusing on AI integration in mathematics education. The analysis reveals that AI-powered learning environments, such as intelligent tutoring systems, adaptive learning platforms, automated feedback tools, and generative AI applications, provide substantial opportunities to improve students' engagement, mathematical reasoning, and independent learning. Furthermore, AI enables teachers to implement data-informed instructional strategies through real-time learning analytics and personalized interventions. Nevertheless, the implementation of AI in algebra education also presents several challenges, including algorithmic bias, concerns regarding academic integrity, unequal access to digital technologies, and insufficient teacher readiness to integrate AI effectively into classroom practice. The findings suggest that the successful transformation of algebra learning requires a balanced approach that combines technological innovation with sound pedagogical principles, digital ethics, and continuous professional development for educators. This study contributes to the growing discourse on AI-enhanced mathematics education by offering a comprehensive synthesis of current evidence and identifying strategic directions for future research and educational practice in the AI era.

Keywords: Artificial Intelligence, Algebra Learning, Mathematics Education, Adaptive Learning, Intelligent Tutoring Systems, Digital Pedagogy

INTRODUCTION

Among various fields of study, mathematics is a discipline that has undergone significant transformation due to the development of AI. Mathematics serves not only as a foundational science for various fields of