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AI-Driven Personalized Learning in Mathematics Education

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Abstract: *Artificial Intelligence (AI) is reshaping mathematics education by enabling personalized, adaptive, and data-driven learning experiences. Traditional classroom instruction often follows a uniform teaching approach, which may not address individual student differences in understanding, pace, and learning style. AI-powered systems analyze student performance in real time, identify knowledge gaps, and automatically adjust the difficulty level and type of mathematical problems presented. This adaptive process helps learners strengthen weak areas while progressing confidently through advanced topics. Intelligent tutoring systems, learning analytics, and predictive modeling play a significant role in enhancing conceptual clarity and improving academic performance in mathematics. These technologies provide instant feedback, step-by-step guidance, and customized practice exercises, creating a supportive and engaging learning environment. Moreover, AI assists teachers by generating performance reports and insights that help in targeted intervention and instructional planning.*

Keywords: *Artificial Intelligence, Mathematics Education, Personalized Learning, Adaptive Learning Systems, Intelligent Tutoring Systems, Learning Analytics, Educational Technology, Predictive Modeling, Student Performance, Smart Learning Systems*

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