

AI-DRIVEN PREDICTIVE ANALYTICS FOR STUDENT PERFORMANCE PREDICTION

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ABSTRACT

Artificial Intelligence (AI)-supported learning analytics has emerged as a transformative approach for predicting student performance and improving educational decision-making in higher education. By combining learning analytics with advanced Artificial Intelligence techniques such as Large Language Models (LLMs), machine learning, and predictive modeling, educational institutions can identify learning patterns, forecast academic outcomes, and provide timely interventions for students at risk of poor performance. Traditional learning analytics systems often rely on descriptive statistics and historical academic records, limiting their ability to deliver personalized and real-time educational support. AI-supported learning analytics overcomes these limitations by integrating curriculum-aware artificial intelligence, Retrieval-Augmented Generation (RAG), Explainable Artificial Intelligence (XAI), Human-in-the-Loop (HITL) verification, and institutional governance frameworks to improve prediction accuracy and educational transparency. This study investigates AI-supported learning analytics for student performance prediction through a qualitative review of recent scholarly literature. The findings indicate that AI-enhanced learning analytics significantly improve prediction accuracy, learner engagement, personalized learning, curriculum alignment, and institutional decision-making while reducing dropout risks and improving academic success. Smart learning guidance systems have demonstrated that artificial intelligence can identify learner needs and provide timely academic recommendations that improve student learning outcomes.

KEYWORDS: *Learning Analytics, Student Performance Prediction, Artificial Intelligence, Curriculum-Aware Artificial Intelligence, Explainable Artificial Intelligence, Retrieval-Augmented Generation, Higher Education*

Article History

Received: 04 Jun 2025 | **Revised:** 08 Jun 2025 | **Accepted:** 12 Jun 2025
