# A Comprehensive Review on Deep Learning Approaches in Educational Data Mining

**Sanjay Yadav[1] and Dr. Shashank Swami[2]**
[1]Research Scholar, Department of Computer Science
[2]Research Guide, Department of Computer Science
Vikrant University, Gwalior, M.P.

**Abstract:** *Educational Data Mining has evolved significantly with the integration of deep learning methodologies capable of modeling complex, nonlinear, and temporal educational data. With the rapid growth of online learning environments, Learning Management Systems, and Massive Open Online Courses, vast volumes of student interaction data are generated daily. Deep learning models such as Artificial Neural Networks, Convolutional Neural Networks, Recurrent Neural Networks, Long Short-Term Memory, Gated Recurrent Units, Autoencoders, Graph Neural Networks, and Transformer architectures have demonstrated superior predictive and adaptive capabilities compared to traditional statistical approaches. This review synthesizes existing literature on deep learning applications in EDM, compares different architectures, discusses implementation challenges, and outlines future research directions. The findings suggest that while deep learning significantly enhances prediction accuracy and personalization, issues of interpretability, ethical data usage, and computational complexity remain critical concerns.*

**Keywords:** Deep Learning, Educational Data Mining, Learning Analytics