

Prediction and Classification of Student Performance in Online Education Based on Machine Learning Approaches

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Abstract

Education is the key to success, providing several options throughout life. Success in education benefits society as a whole in addition to promoting individual achievement. The push for employable skills, value generation, and job development on a worldwide scale may not be unrelated to this educational system. Since a student's presence is a crucial component of an accurate assessment of teaching and learning, keeping track of their attendance is crucial in online education. Students who participate in online training get the skills necessary to improve their capacity to develop viable and beneficial solutions to developing challenges. Currently, the majority of the one-way structure used to extract intelligent classification characteristics from online teaching student accomplishment data is. Many aspiring business owners use technology to participate in online learning in order to accomplish this. This study offers a machine learning method to forecast students' degree of adaptation in online learning. The Kaggle Students Adaptability Level in Online Education dataset, which includes a variety of features, will be used in this study. Data preprocessing, data visualization, feature engineering, and machine learning approaches will all be used to this dataset¹. Numerous aspects, such as the student's age, parent's education and employment, health, and so on, that impact student performance will be evaluated and depicted in this study. Many Machine Learning (ML) techniques will be applied in order to predict the performance of the students. The machine learning experiment outcomes will be assessed using the following metrics: f1-score measures, accuracy, precision, recall, confusion matrix, and classification report. The comparison study will demonstrate that the suggested machine learning models outperformed other models in terms of accuracy when it came to the prediction and categorization of student performance in online learning. These study results examine new learning approaches, emphasize students' potential, and assist teachers understand how to assess and guide students on digital platforms.

¹ <https://www.kaggle.com/datasets/mdmahmudulhasansuzan/students-adaptability-level-in-online-education>