

Exploring Machine Learning Techniques to Predict and Enhance Preservice Teachers' Performance

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Abstract : The prediction of student performance has become a key area of interest for researchers, with efforts focused on developing models to enhance student competence and improve educational institutions. These models help educators design effective teaching strategies, address specific student needs, and guide learning outcomes at all educational levels, including high school students, preservice teachers, and beyond. Therefore, we aim to identify the most accurate machine learning technique for predicting preservice teachers' performance. Additionally, it seeks to explore the relationships between various features and identify key indicators for creating an effective prediction model. Key attributes considered in this study include courses taken during their study, course grades, cumulative grades, and student satisfaction. The data of preservice teachers will be collected from three universities in Cambodia and Thailand from 2021 to 2024. Various machine learning algorithms will be used and evaluated using classification metrics such as accuracy, precision, recall, and F1-score. Due to the characteristics of data collection and the theoretical concerns in the classification, the preliminary expectations indicate that the Random Forest algorithm may yield the highest accuracy for predicting preservice teachers' performance, though the actual outcomes may vary based on the research findings. The outcomes of this study have the potential to assist educators in developing effective strategies for predicting and enhancing the performance of preservice teachers. By leveraging the predictive model, educators can anticipate student performance, identify challenges and difficulties faced by students, and provide timely feedback and support.

Keywords : machine learning, preservice teacher, classification algorithm, predictive modeling

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