

ABSTRACT

**Predicting Student Success: A Case Study Based on the Transcript and
Personal Data of the Graduated Students at Computer Engineering
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In recent years, Educational Data Mining (EDM) has become more popular in data analysis projects. Institutes try to improve their educational quality as well as to invest in analyzing educational data. Predicting student grades is a significant challenge in EDM, and also it has lots of benefits for improving quality in the education process. In this study, we aim at predicting the student success in the selected courses considering their transcript and personal data. For this reason, we applied various Machine Learning (ML) algorithms on the graduated student data. We developed several concepts for analyzing students success at the selected courses. First, we define three metrics to measure the student success. These student success metrics are grade letters, success groups and fail-pass state. Furthermore, we created four different data sets from the graduated student data as inputs to the selected ML algorithms. Results of this study indicate that high or low student grade letters can be predicted better when compared to the moderate grade letters. Similarly, according to the success group metric; lower and higher success groups of the students can be predicted with higher accuracy compared to the average success group. For the last success metric, the prediction results are far better for the passed students than predicting the failed students. Considering the four input data sets, we could not locate considerable differences in prediction

success. However, the data set created by the student personal data generates lower prediction success compared the rest of the data sets. The prediction success for the selected courses is observed to be increasing for the courses at the last two semesters of the curriculum. The details of the findings and their possible causes are analyzed and discussed in the related chapters. We believe that the results of this study can serve as a foundation to build a student recommendation system to predict their future course success.

Keywords: machine learning, educational data mining, data mining, prediction, learning analytic