Analysis of the Correlation between University Students' Academic Performance and Influential Factors

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University student's academic standing has an impact from variety of aspects of their daily lives. A range of psychological, social, economic, cultural, behavioral, geographical, and environmental factors influences the academic success of university students. This investigation focuses on factors that have an impact on undergraduate students' academic performance. The major goal of this study was to discover and evaluate the factors that affect university students' academic performance and success, as well as to predict the students' performance and achievement based on the identified factors. This study used five different Machine Learning techniques and further proposes an ensemble approach consists of K- Nearest Neighbor (K-NN) Classifier, XGBboost Classifier (XGB), and RandomForest Classifier (RF) to create a new model in analyzing and predicting the university students' educational achievement and performance. A questionnaire, which consisted of three parts, was used in collecting data for the study. Economical, psychological, cultural, geographical, social, behavioral and environmental factors can analyzed using this. The questionnaire was shared among the undergraduates in Sri Lanka. Random sampling was used to choose the participants. Two-thousand (2000) university students took part in this study. The results demonstrated that the K-Nearest Neighbor (K-NN) has the highest prediction accuracy of 83.08 %. Further, the proposed ensemble approach enhanced the accuracy and demonstrated an accuracy of 84.54 %. The correlation of the factors towards the university students' academic performance was identified. According to the results, cultural and economic factors were identified as the most influential factors for predicting the university students' academic performance and behavioral factors is the least influential factor. Furthermore, the results are important for the educational institutes to identify the most influential factors towards enhancing the university students' academic performance.

Key words: Academic performance, Behavioral factors, Economic factors, Psychological Factors