**INTRODUCTION**

In Portugal, students go to secondary school for three years, from grade 10 to 12. Children studying in Portugal can choose between schools that prepare them for university or vocational schools which offer more practical subjects. This report is to gain insights into the determinants of academic success in secondary education within two Portuguese schools, focusing on the Portuguese language studies. The study uses a dataset with various variables, including student grades and socio-economic factors related to the student, gathered through school reports and questionnaires. We have data from two different schools in Portugal: Gabriel Pereira and Mousinho da Silveira and is made up of 824 observations and 41 variables in total. There are three grades for each of the subject, Portuguese and Math but in our analysis, we will focus on the first grade they had in from the Portuguese class.

The analysis is structured into two tasks. The first task is to build a predictive model for the initial period grade in Portuguese (G1.Port) using non-academic factors, such as free time, school support, and personal habits. The second task categorizes G1.Port into three performance levels of the same height and develops a classification model based on the same set of predictors.

KEY FINDINGS

For the first task the linear regression model for G1.Port without grade features indicates that personal habits and support mechanisms significantly impact Portuguese language performance. The model's R-squared value of 0.1396 suggests that these factors explain approximately 13.96% of the variance in student grades. For the classification model, which categorizes G1.Port, demonstrates a higher R-squared value of 0.2629, indicating that the inclusion of categorical variables and binning improves the model's explanatory power. This model more effectively captures the complexities influencing student grades. Comparing the two models based on Residual Deviance and Akaike Information Criterion (AIC), the second model with a lower Residual Deviance and AIC outperforms the first. This suggests that it provides a better balance between fit and complexity and adeptly captures a larger fraction of the variance in student grades.

CONCLUSION:

In conclusion, the analysis underscores the nature of academic success and the importance of considering a wide range of factors, from personal habits to support systems, in educational research. However, the study there were some limitations, including potential unmeasured variables, a limited dataset diversity due to the involvement of only two schools, and the inability to draw causal inferences. Despite limitations, the models offer valuable insights for educators and policymakers, emphasizing the influence of factors such as free time, school support, and parental involvement on student performance. By continually refining analytical methods and addressing limitations, researchers can contribute more effectively to the enhancement of educational outcomes. These insights show the nature of academic achievement, highlighting that it is not solely contingent on classroom instruction but also influenced by broader socio-economic and personal factors. This can us to guide targeted educational strategies and interventions to enhance student performance in Portuguese language courses in the future.