

REPORT 1- Report Critique

1. The authors' research question mentioned in their report is "What external factors are associated with a student's academic performance?". They are motivated to explore this because of their own experiences as students and a desire to understand how background and choices play a role in academic success. While this reasoning makes their interest in the topic clear, it does not really explain why this study matters beyond personal curiosity. It would be stronger if they talked about how understanding these factors could lead to better educational policies or support for students who are struggling. In my opinion, expanding on the impact on society by their findings can make their motivation more compelling.
2. The authors' exploratory analysis guided their statistical analysis. They used visualizations to identify potential covariates associated with academic performance. They analyzed the boxplots and observed differences in medians across various categories, which guided their selection of covariates for further analysis. This step helped them narrow down the variables to the most relevant ones rather than including all the variables.
Additionally, they examined the distribution of the response variable, final grades, and identified an concentration of values at zero. These low grades likely represented students who did not attempt the exam or dropped out therefore, they decided to remove these outliers. This decision improved the reliability of their analysis. After the removal of these outliers, they found that the distribution was roughly symmetric, and bell shaped which led them to choose linear regression for modelling.
3. The authors' concluded that external factors such as gender, maternal occupation, study time, past failures, school support, and social habits influence students' academic performance. There were also findings that align with expectations such as the benefits of studying more. These can be some of the confounding factors. They wanted to understand how personal background and choices affect academic success, but their analysis mainly highlights statistical connections rather than going into the real reasons behind them.
4. One good thing about their discussion is that they acknowledged the unexpected findings such as negative impact of school support on academic performance. They also explored possible explanations of this, such as, over-reliance on support or underlying socioeconomic factors. They also showed awareness of theses potential confounding factors.

On the other hand, one area that could be improved is their explanation of practical implications. They identified external key factors that influence performance, but they did not discuss how these findings could be used or in what way they can be implemented. They should have provided recommendations based on their analysis and this would have made their discussion more impactful.

5. One area that could be improved is the discussion of model limitations. The authors mention issues like low R square values and the assumption of independence, but they did not fully explore how these limitations impact their findings. Their model explains a small portion of the variation in academic performance, and they did not consider other key factors that might be missing. For example, factors such as motivation or teacher quality could have had a major effect but were not accounted for. While they acknowledge that their data is observational, they did not discuss potential biases.