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ABSTRACT

Introduction: Exams are a very important part of academia and tests students on whether they can apply what they learned. Performance on these exams can indicate whether a student will pass a course. This research will be important in identifying factors that could help students better prepare for exams. The goal of this study is to use exploratory factor analysis to find the factors with the biggest impact on exam performance.

Methods: The data set used includes 6,607 observations. All of which was randomly generated to simulate realistic scenarios. The data set was then found and downloaded from Kaggle. The data included ten dimensions. Both *Previous Scores* which was the scores of previous exams, and *Sleep Hours,* the average number of hours students slept, loaded onto the factor "Sleep Effectiveness". The response variable *Exam Score* had the following predictive variables: *Sleep Effectiveness, Extracurricular Activities, Parental Involvement, Attendance, Teacher Quality, Tutoring Sessions, and Hours Studied.*

Results: Using exploratory factor analysis, we found a significant effect of *Attendance, Parental Involvement, Teacher Quality, Extracurricular Activities, Tutoring Sessions, and Hours Studied* on *Exam Scores,* all of which had an SE of 0.007, and a p-value of 0.000. We found that of those variables, *Hours studied,* and *Attendance* had the strongest effect on *Exam Scores* with their β values being .587, and .452 respectively.

Conclusion: We measured the model fit using fit indices. The GFI value is 0.998, which is above the .95 threshold. The RMSEA has a value of 0, which is below the 0.08 threshold. The CFI was also above the .95 threshold with a value of 1.00. These fit indices show that our model is the best fit for this data set. Therefore, our model could be used by students looking for things that can help them perform better on their exams.

Commented [VC1]: Your introduction is excellent—clear and concise. The method section is well-structured. However, one thing to consider is briefly describing all the predictors, such as clarifying what "Parent Involvement" entails—does it refer to the number of hours, their presence, or something else? For the results, the starting points are strong, but consider including all predictors and their impact on exam performance, even those with minimal significance. Overall, the draft looks good; just ensure you incorporate key indices like RMSEA, CFI, and NFI at the end too.