Students Performance in Exams

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Abstract

A dashboard has been built to showcase a data viz that analyzes 1,000 students' exam performance in Math, Reading and Writing from the United States. The visualization is very important to understand how the students are performing, to determine best practices that can be shared with new students about to take the same exam and for teachers to help plan future curriculum.We use tableau desktop to present the dashboard via pie charts, bar charts and correlation matrix charts. The graphical arrangement has been designed to allow the user to quickly understand a summary of student performance and then backed up with interesting data analysis to reach a meaningful hypothesis. Furthermore, there is sufficient data to perform correlation testing to further understand the significance of the exam results.

Keywords Students exam performance in Math . Reading and Writing . Data viz . Dashboard. Bar charts . pie charts .correlation matrix charts.

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1 . Introduction

Performing student performance prediction in an academic institution can be helpful to provide the student performance mitigation mechanism because it can be managed earlier by the management to decrease the student dropout rate.

Why is it important to analyze student performance?

Analyzing student work is an essential part of teaching. Teachers assign, collect and examine student work all the time to assess student learning and to revise and improve teaching. Ongoing assessment of student learning allows teachers to engage in continuous quality improvement of their courses. Many factors can influence a student's performance, including the influence of the parents' educational background, test preparation, student health, and so on.What we'll do is analyze the performance of students based on various features such as gender, parental level of education, and the status of test preparation course, etc. Therefore, we will also analyze which gender will perform better. Can we assume a student's performance is based on their race or ethnicity? Does the parental level of education matter? Does lunch's standard make any difference in a student's performance? Will students perform well if they are prepared for the examination?

After I have imported the dataset into my Google Sheet , I could easily conduct the essential evaluations and descriptions of the features provided, this will make it easier for us to compare math scores, reading scores, and writing scores counts, and other features provided.

Table 1. data dictionary

```
gender                          category
race/ethnicity                  category
parental level of education     category
lunch                           category
test preparation course         category
math score                         int64
reading score                      int64
writing score                      int64
```

2 . Related Works

After our research we found that most papers scientifically talked about the same problem "prediction performance students " but in different subjects not in our subjects(Marks secured by the students in high school) as we did .so we can say that our dataset is modern and no one used it before for data visualization.In this work we propose a Data Visualization

(dashboard) of the student performance in the exams **" reading, writing and math score"** for making good decisions.

3 . Project Description

In this kernel we are going to explore the "Student Performance in Exams" dataset, generate various cool visualizations to better understand the data, and create a prediction model for scores in various subject.The first step is to read our dataset into tableau and explore it's summary and structure. The dataset includes 8 variables with 1000 observations. Among the variables are math, reading and writing scores, demographic information (parents education, gender, race) and data on test preparation. We serve to visualize this data in order to facilitate the understanding of the data. The primary purpose of visualization is to find visual patterns. We are going to make a dashboard that plots various test scores versus gender using tableau desktop to determine the scoring dynamics between males and females.

4. Evaluation

to perform a good dashboard we are going to apply many rules of Tufte as : showing the data,using graphics design(pie chart,bar chart,data table..) , Avoid distorting what the data have to say, present the datasets more coherently , get the viewer to compare several elements of data and we are closely integrated with the statistical and verbal descriptions of the data set.

**Table 2:** Analytical Dashboard for making decision
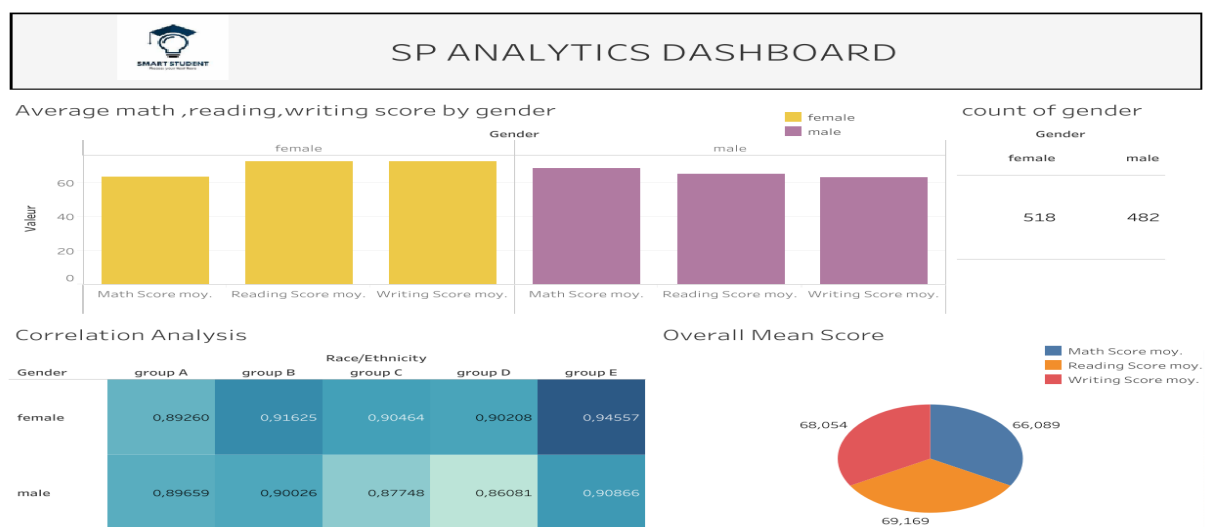
5. Discussion

count of gender

Gender	
female	male
518	482

In our dashboard we have analyzed that female students-518 and male students-482 showed the probability that women nowadays outnumbered men at every university. We could say that it has become a trend nowadays and the numbers keep increasing every year in the majority of countries. Therefore, if we could question why this happened, it's because the majority of boys these days tend to have less interest and focus on school, which leads them to lower grades in studies.

Average math ,reading,writing score by gender
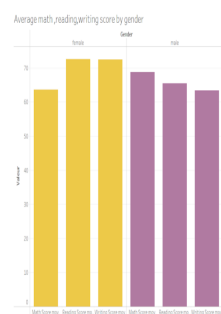
Reading and writing are pillars of learning in all disciplines and throughout the school curriculum. We also know that the report in writing plays a decisive role in the development of skills, in our Data viz we see that most of the students (female) read and write well, they have a high mark in the subjects of reading and writing ."score reading and score writing" so we can say that the female students are more proficient in reading and writing ,in contrast students male efficient just in mathematics.

Overall Mean Score
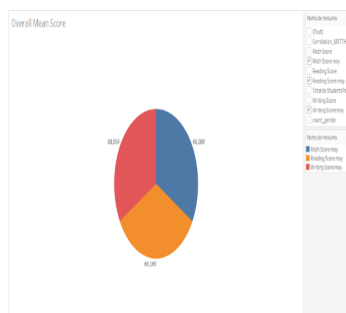
Almost all the scores are close to each other. There is average success in all three courses.

Correlation Analysis

Gender	group A	group B	group C	group D	group E
female	0,89260	0,91625	0,90464	0,90208	0,94557
male	0,89659	0,90026	0,87748	0,86081	0,90866

Race/Ethnicity

We can see the correlation between reading and mathematical scores for gender and race/Ethnicity .

6. Conclusion

To conclude, we can't decide students' performance based on their race or ethnicity. However, students that completed their course have scored better than the ones who haven't completed the course. Here we could say that math score, reading score, and writing score are highly correlated. If any student performs better in any of the subjects, we can say that they will perform well in any subject. Therefore, there will always be underperformers in every university, and we also have many underperformers in each category.Thanks to Big Data, the performance of students is improving via Data viz. Data analysis is now making it possible to improve school and education systems around the world. Big Data Analytics has the potential to help schools run more efficiently, enable teachers to improve their methods, and prevent students from falling into academic failure.

7. References

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https://reader.elsevier.com/reader/sd/pii/S1877042811005969?token=69CE952DAD173C918863BF29B5D1C46031CDFBE48659FE2CB51AB033A6FD7E4C8E225F5EE0544EB9199F539573D48AF0&originRegion=eu-west-1&originCreation=20230104212659 [3]

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[1] {how Dashboard looks }.

[2] {Dataset form}

[3] {A study of factors affecting students' performance in examination at university level}