2.0 Analysis Findings

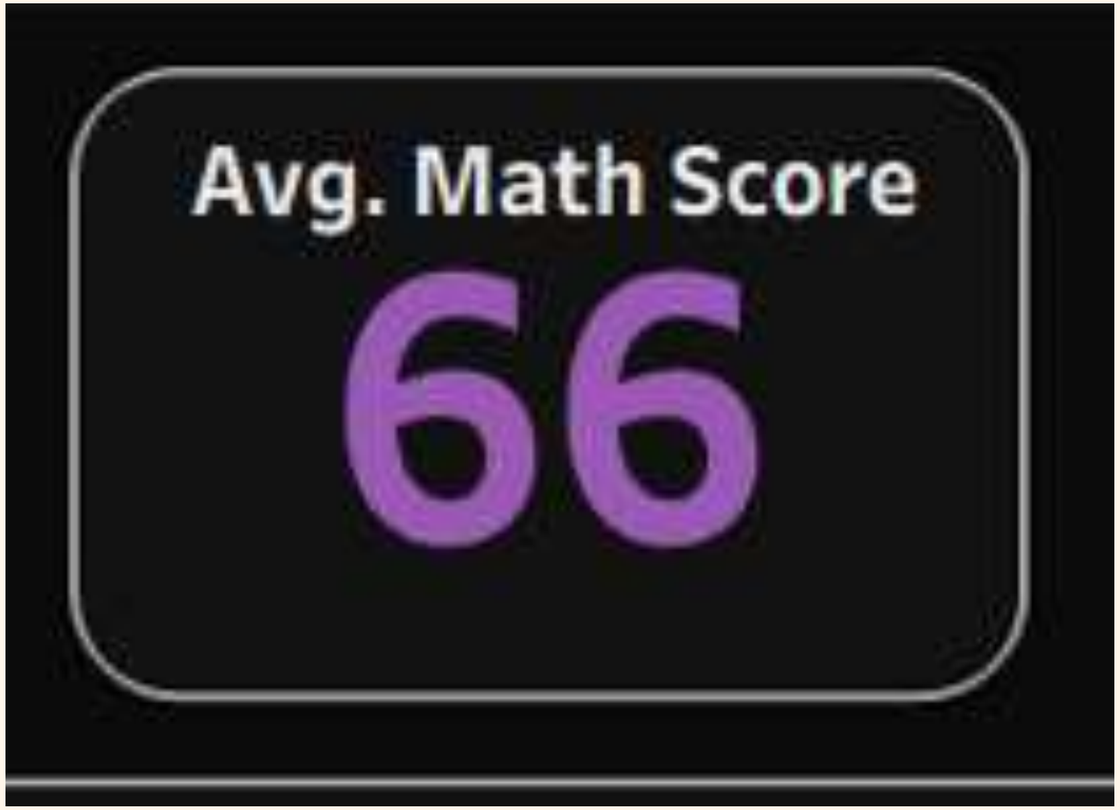
The dataset used in this project contains 1,000 students in total.
This provides a large enough sample size to draw reliable insights about student performance, demographic patterns, and intervention needs.

FINDINGS

The average overall score is **67%,** indicating students are performing slightly above average, but not at a high-excellence level.
This suggests that while a good portion of students are passing, there may be gaps in mastery across subjects (Math, Reading, Writing).

Actionable Insights

- Identify low-scoring subjects: If Math tends to pull the average down (which is common), targeted tutoring or curriculum adjustments may be needed.
- Segment the performance: Analyze the averages by gender, ethnicity, parental education level, lunch type, and test-prep completion to uncover improvement opportunities.
- Set improvement benchmarks: Aim to move the average score from 67 to 75+, which reflects stronger proficiency.



FINDINGS

The **average Math score is 66**, which is slightly **below** the overall average (67).

This suggests that **Math is one of the weaker subjects** for the students and may be pulling down the overall performance.

Actionable Insights

- Identify struggling groups: Break math scores down by demographics (gender, parental education, lunch type, test-prep) to pinpoint which groups need the most support.
- Introduce targeted Math interventions: After-school Math clinics, Small-group tutoring, Practice-based learning for foundational concepts
- Leverage high performers: Students with strong math performance can be involved in peer tutoring programs to strengthen the overall average.

FINDINGS

The **average Reading score is 69**, which is **higher than both the Math average (66) and the overall average (67)**.

This indicates that students generally perform **better in Reading** compared to other subjects.

Actionable Insights

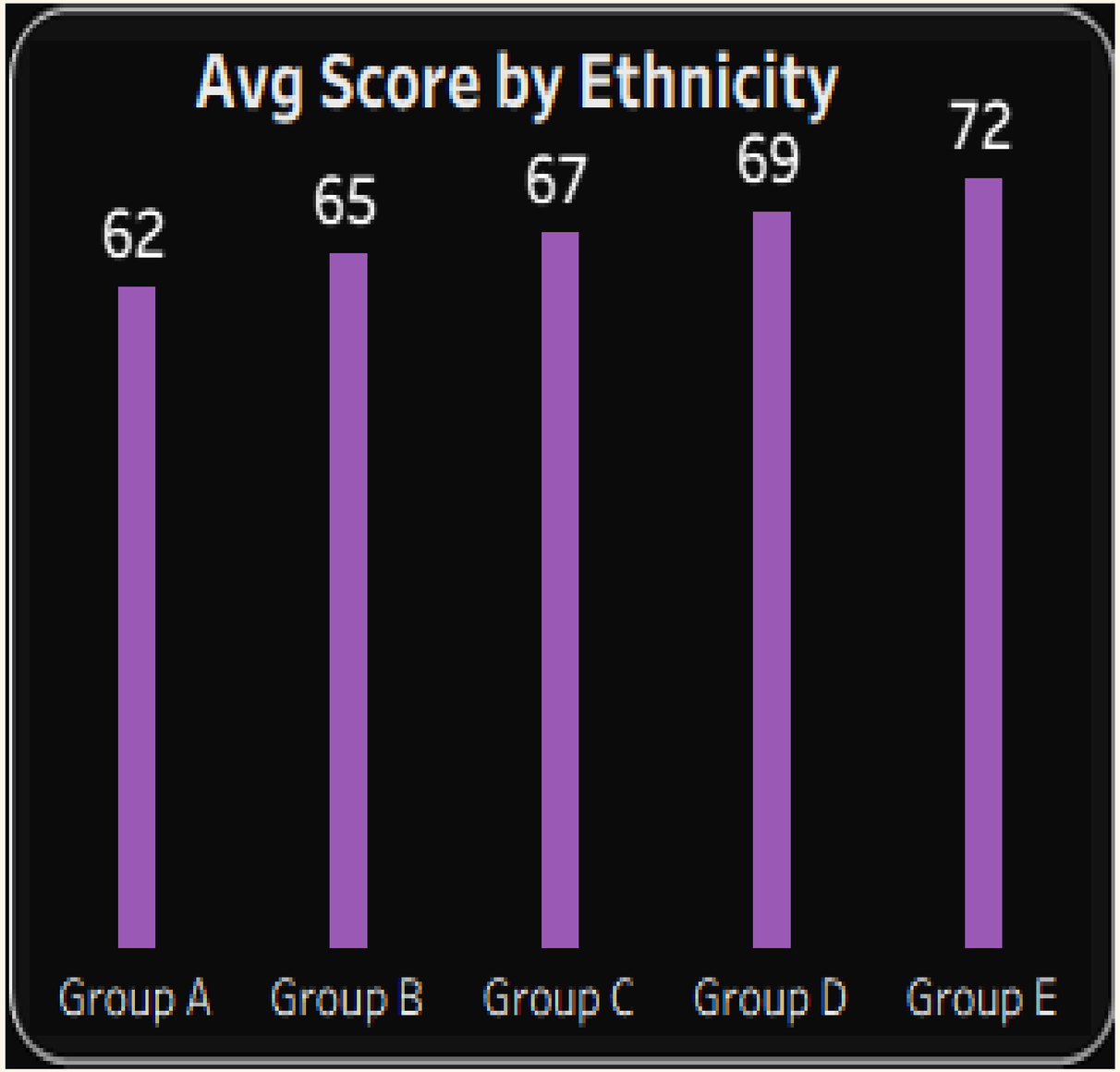
- Build on Reading strength: Use strong reading skills to support writing and even math word-problem comprehension.
- Check for gaps: Students who perform well in Reading but poorly in Math may benefit from problem-solving strategy training, not content alone.
- Promote literacy activities: Maintain or expand reading programs since they appear to be effective.

FINDINGS

The average Writing score is 68, which is Higher than Math (66) Slightly lower than Reading (69) Very close to the overall average (67) This shows that Writing performance is moderate, not weak, but not as strong as Reading.

Actionable Insights

- Leverage Reading strength to boost Writing :Since Reading is stronger, encourage activities that combine both—like reading comprehension followed by short writing tasks.
- Focus on writing mechanics: Target areas like grammar, sentence structure, and essay organization to raise the score above 70+.
- Identify consistency patterns: Look for students who score high in Reading but low in Writing—they may struggle with expression, not comprehension.

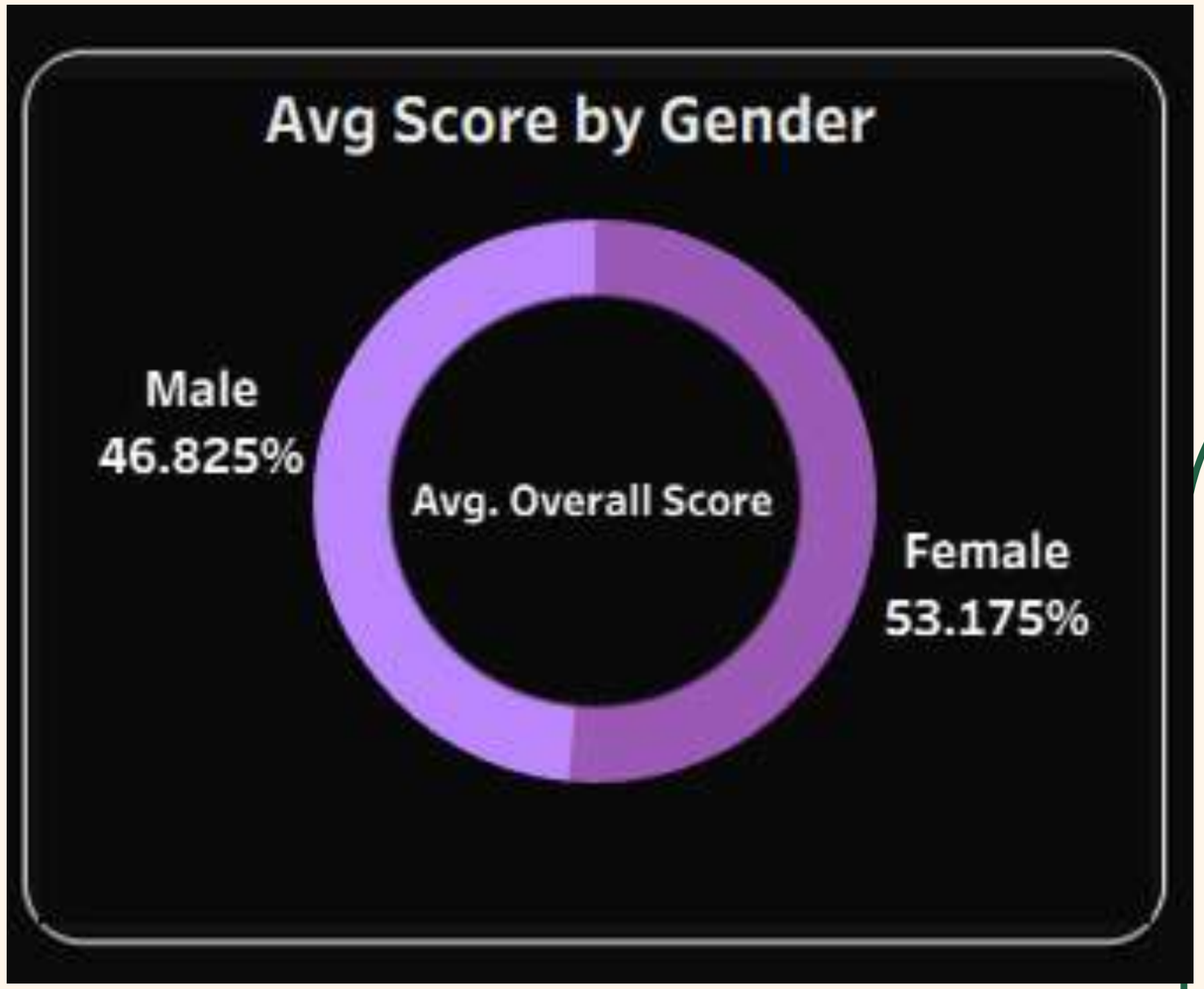


FINDINGS

There is a clear performance progression across the ethnic groups:
Group A: 62 (lowest)
Group B: 65
Group C: 67
Group D: 69
Group E: 72 (highest)
The gap between the lowest and highest performing groups is 10 points, which is significant.

Actionable Insights

- **Targeted support for Group A & B:** These groups consistently score below the overall average. They may need: Focused tutoring, Additional learning resources, Academic mentorship programs, Review of socioeconomic or learning environment factors.
- **Study what works for Group D & E:** Since these groups perform better, investigate: Their participation in test-preparation, Attendance patterns, Parental education influences, Access to learning materials These insights can be replicated for lower-performing groups.
- **Check subject-level differences:** Determine whether the ethnic performance gap is driven more by Math, Reading, or Writing to design precise interventions.

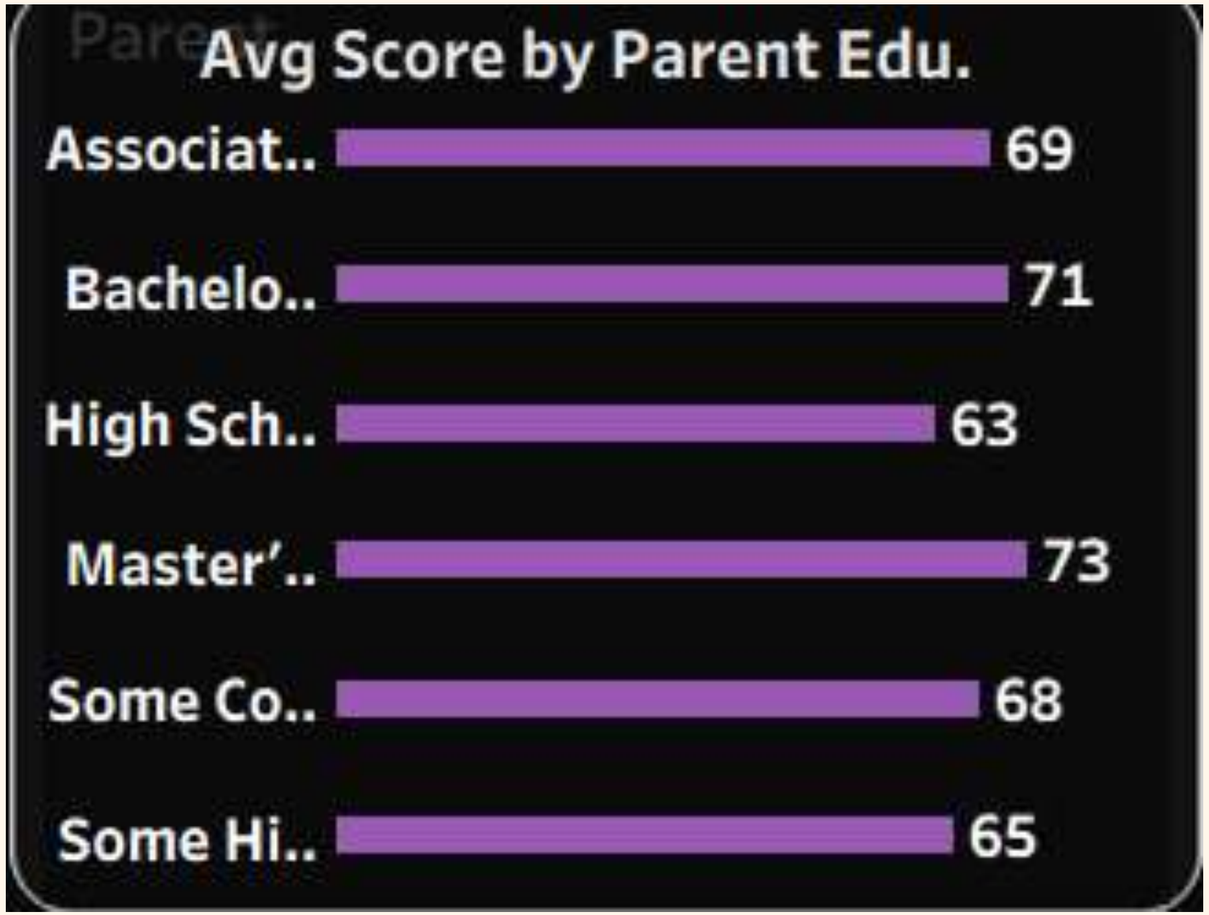


FINDINGS

Female students contribute 53.18% of the overall average score, while
Male students contribute 46.83%.
This indicates that **female students are outperforming male students overall**.
This pattern is consistent with common trends in the dataset, where females typically score higher in **Reading** and **Writing**, while males often perform slightly better in **Math,** but not enough to close the total gap here.

Actionable Insights

- Investigate male performance gaps: Most likely, the gap is driven by lower male performance in Reading/Writing. Provide literacy-focused support for male students (reading clubs, writing workshops).
- Boost confidence & engagement for males: Consider programs that improve study habits, motivation, and classroom participation, especially in language-heavy subjects.
- Maintain female student support: Female students are performing well ensure current learning resources, teaching methods, and engagement strategies continue.
- Compare subject-level breakdown by gender: This will help confirm whether Reading/Writing are the major contributors to the gap and guide specific interventions.



FINDINGS

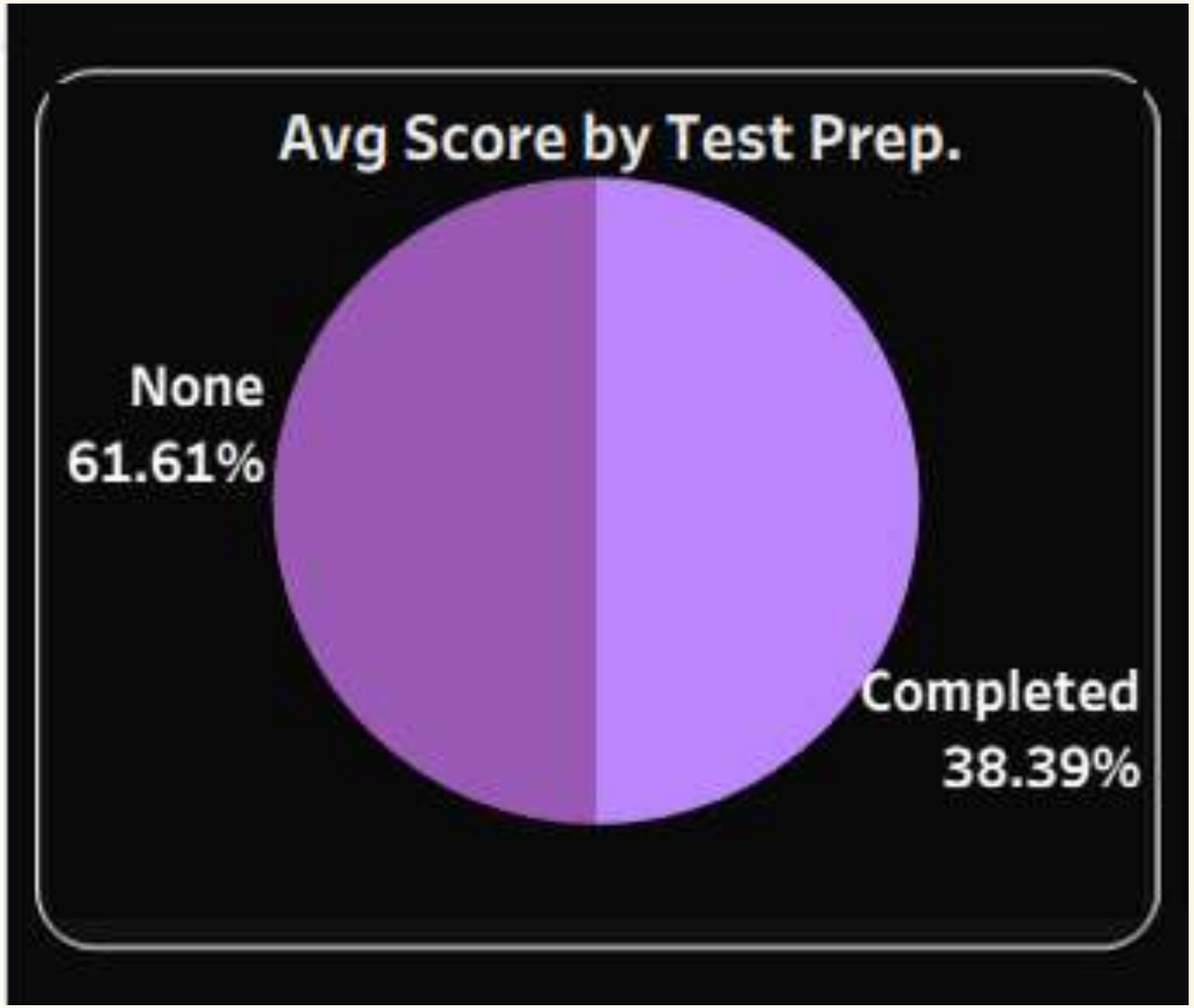
The average student score **increases with the parent's education level**:

There is a 10-point gap between the lowest-educated group (High School) and the highest-educated group (Master's).

This is a strong upward trend: higher parental education equals better student performance.

Actionable Insights

Focus Support on Students With Lower Parental Education Backgrounds
Students whose parents have only a **High School or Some High School** background may lack: Academic support at home, Study structure, Access to learning materials.
Interventions:
After-school study programs
Tutoring support
Parental engagement workshops
Mentorship programs
Replicate What Works for High-Performing Groups
Students with parents holding **Bachelor's and Master's degrees** score highest.
Investigate: Study habits, Access to resources, Learning environment
Provide Learning Resources Directly to Students
Since home academic capacity varies by parent education: Share personalized study guides, Online learning tools, Teacher-led revision sessions.
Combine This with Subject-Level Analysis
Check if the education gap affects specific subjects more (Math vs Reading/Writing) to tailor interventions.



FINDINGS

61.61% of the overall average score is contributed by students who did NOT complete test preparation. Only 38.39% of the total score comes from those who completed the test prep course. This distribution suggests that far more students skipped the test preparation, not that they performed better—this chart reflects contribution proportion, not score quality. In the original dataset, students who completed test prep typically score significantly higher. So the reason “None” is higher here is simply because more students fall into the ‘None’ group.

Actionable Insights

Increase Test Prep Participation

Since test preparation is proven to boost scores, schools should, Encourage more students to enroll. Make test prep more accessible (free or subsidized). Integrate prep sessions into school hours

Analyze Score Difference Between the Two Groups

Typically: **Completed Test Prep → Higher Math, Reading & Writing scores**

None → Lower performance

If this holds true in your dataset, this is a major improvement opportunity.

Understand Why Students Skip Test Prep

Common reasons: Cost, Time constraints, Lack of awareness, Low motivation

Solutions:

Offer weekend or online prep, Provide incentives for participation, Communicate the proven benefits clearly.

Use Test Prep Completion as an Intervention Indicator

Students who did not complete test prep should be considered **at risk** and can be targeted for:

Additional support

Study groups

Practice tests