

Visualising and Visceralising Student Performance Data

Introduction

This assignment sheds light on how students' performance data can be visualised through different perspectives. First a visual analytics approach and second a feminist approach. The dataset, *StudentsPerformance.csv*, holds information and data about 1000 students test results in math, reading and writing, it also contains data on demographic variables like, ethnicity, gender, test preparation and parents level of education. The goal is to see how different design choices reveal or undermine certain interpretations of the same dataset, and how they shape the viewers emotional and cognitive experience.

Visual Analytics Approach

The first visualisation adopts a visual analytics perspective, aiming to support analytical reasoning and enable the viewer to identify statistical relationships. A boxplot compares students' average test scores with their parents' level of education. The distribution of results are illustrated by each box in the boxplot. Each box represents a different educational group, which makes it possible to compare the results across categories.

A clear pattern is revealed by the results and the visualization. The results show that students whose parents have a higher educational degree tend to get better average scores. This confirms documented correlations between academic performance and socioeconomic background. This design features consistent axes, statistical aggregation and neutral colors to present a sense of objectivity and precision.

However, this apparent neutrality also functions ideologically. By showing only what is measurable, the visualisation does not take the realities of students into account. This visualisation only shows what is, not why it is the way it is. The viewer is therefore positioned as an external observer, interpreting the graph as objective data instead of taking the contextual factors into account. This mode of representation aligns with the positivist tradition of treating data as neutral evidence rather than as situated and partial knowledge.

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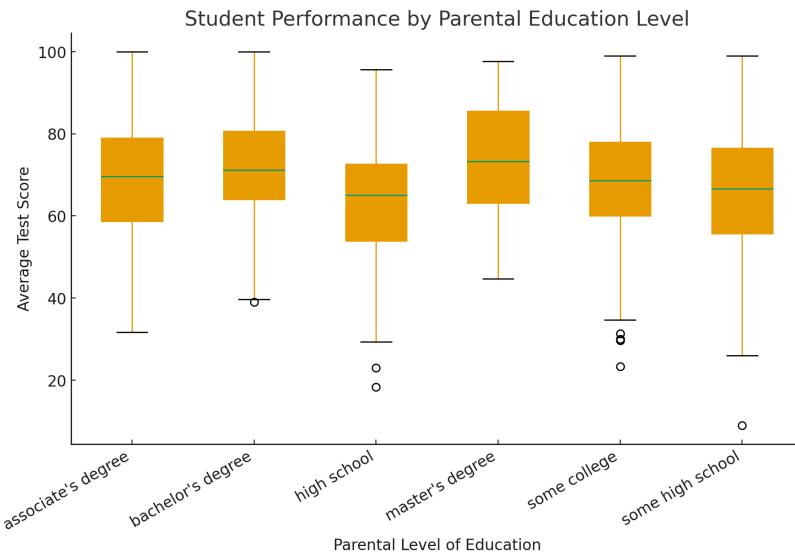


Image is generated with AI, based on the Kaggle dataset.

Feminist Critical Data Studies Approach

The second visualisation challenges this neutrality through a feminist data studies lens. Instead of focusing on correlations that are measurable, it focuses on the emotional and the political dimensions of visualizing, and on the factors that might be hidden within the data. The students in the dataset are represented as plots in a scatterplot of math versus reading scores, the color code is connected to ethnicity. Yet, unlike the first visualisation, the points are semi transparent. The opacity symbolises how individuality is lost when human experiences are transformed into statistical categories such as “group A” or “group B.”

This design is inspired by Donna Haraway's concept of situated knowledges and Catherine D'Ignazio and Laurend Klein's Data feminism (D'Ignazio, C. & Klein, L., 2020). They both make the point that data visualizations reflect power relations, because they determine whose experiences are seen and whose experiences are hidden in the visualization. Therefore the feminist visualization uses aesthetic strategies, layering, transparency and tries to evoke emotion instead of clarity. So instead of providing concrete answers, it is trying to discomfort the viewer or tries to get the viewer to reflect. The viewer becomes aware that the dataset not only represents students but also participates in constructing their identities through categories of ethnicity and education.

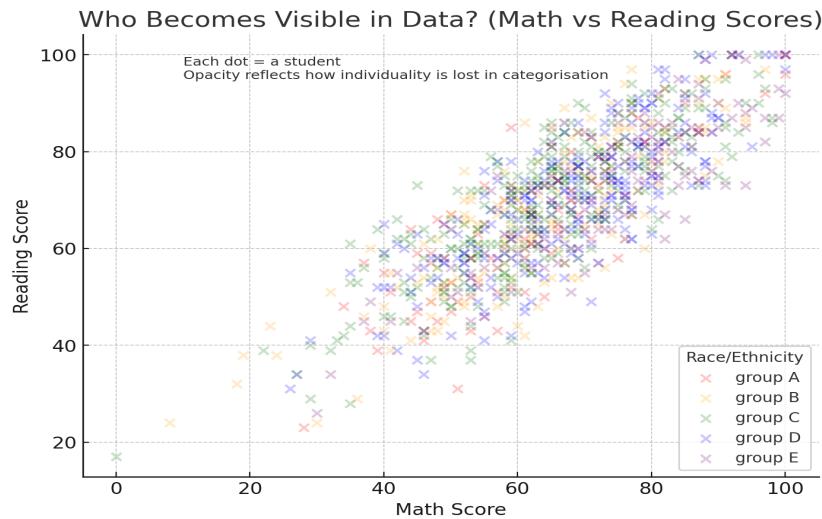


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Comparative Reflection

Comparing the two visualisations, highlights how different epistemological stances shape what can be known from data. The visual analytics approach presents information as stable, measurable, and generalisable whereas the feminist approach destabilises that certainty, foregrounding the gaps and absences that quantitative methods tend to erase. While the first supports understanding, the second provokes thought.

Both, however, are forms of curation, each filters and frames the dataset in particular ways. The analytical visualisation makes inequality visible but risks naturalising it as a statistical fact. The feminist one, in contrast, exposes how those inequalities are produced and maintained through the very act of categorisation. The two together demonstrate that data visualisation is not only a technical practice but also a political and ethical one.

Conclusion

Through this exercise, I learned that visualisations are never neutral windows onto reality. They are interpretive acts that frame, emphasise, and conceal. The visual analytics approach constructs knowledge through aggregation and comparison, while the feminist visualisation constructs knowledge through affect and critique. Both ways of seeing produce partial truths, and it is precisely through recognising their limits that we can begin to curate data more responsibly.

Literature review:

D'Ignazio, C. & Klein, L. (2020). Chapter 3: On Rational, Scientific, Objective Viewpoints from Mythical, Imaginary, Impossible Standpoints.

<https://data-feminism.mitpress.mit.edu/pub/5evfe9yd/release/5>