

# Visualising and Visceralising Student Performance Data

## Introduction

This project explores how student performance data can be visualised through two different perspectives, a visual analytics approach and a feminist/critical data studies approach. The dataset, *StudentsPerformance.csv*, contains information about 1000 students test results in mathematics, reading, and writing, along with demographic variables such as gender, ethnicity, lunch status, test preparation, and parental level of education. The goal is to investigate how different design choices reveal or suppress particular interpretations of the same dataset, and how they shape the viewer's cognitive and emotional experience.

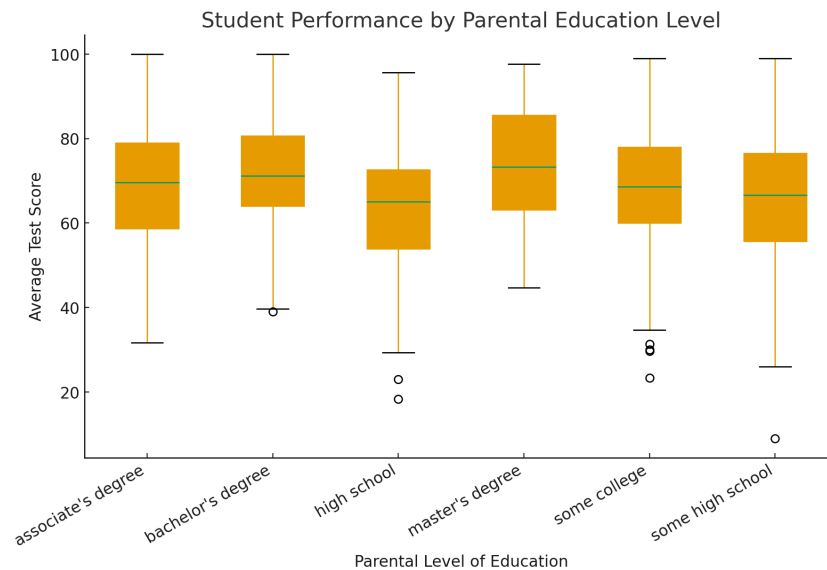
## Visual Analytics Approach

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. Each box summarises the distribution of results within a specific educational group, allowing for a structured comparison across categories.

The result reveals a clear pattern: students whose parents hold higher education degrees tend to achieve higher average scores. This confirms well documented correlations between socioeconomic background and academic performance. The design employs neutral colours, consistent axes, and statistical aggregation to present a sense of precision and objectivity.

However, this apparent neutrality also functions ideologically. By visualising only what is measurable, the plot abstracts away from the lived realities of students, it shows the what, not the why. The viewer is positioned as an external observer, interpreting the data through a detached, analytical gaze. This mode of representation aligns with the positivist tradition of

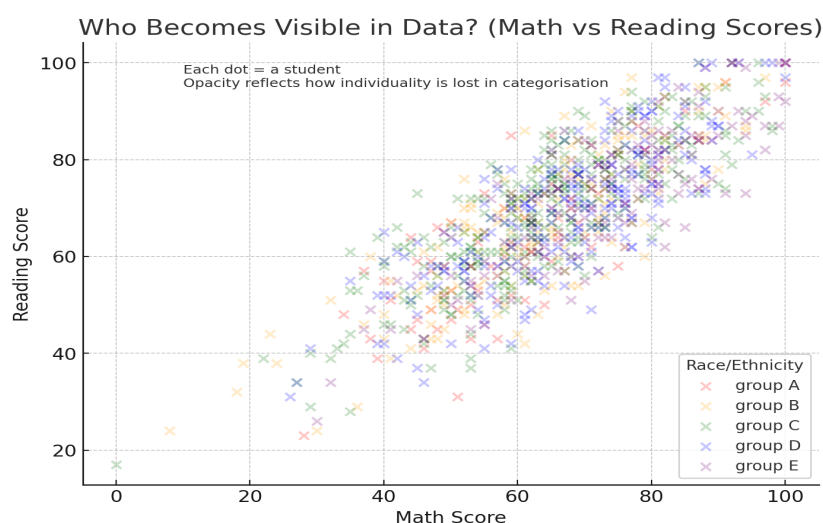
treating data as neutral evidence rather than as situated and partial knowledge.



## Feminist Critical Data Studies Approach

The second visualisation challenges this neutrality through a feminist data studies lens. Instead of highlighting measurable correlations, it focuses on the affective and political dimensions of visibility and invisibility within data. Each student is represented as a point in a scatterplot of math versus reading scores, colour coded by 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 draws inspiration from Donna Haraway’s concept of situated knowledges and Catherine D’Ignazio and Lauren Klein’s Data Feminism. Both argue that data visualisations inevitably reflect power relations, they determine whose experiences are seen, whose are obscured, and who is counted at all. The feminist visualisation therefore uses aesthetic strategies, transparency, layering, and spatial ambiguity to evoke emotion rather than clarity. Instead of providing answers, it invites discomfort and reflection. The viewer becomes aware that the dataset not only represents students but also participates in constructing their identities through categories of ethnicity and education.



## **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.