**Introduction: The Importance of School Ratings**

School systems play a crucial role in shaping the educational landscape of a nation, providing students with the knowledge, skills, and opportunities they need to succeed. To assess the performance and effectiveness of these systems, schools are often measured and ranked using various criteria. This process serves multiple purposes, including evaluating educational outcomes, informing policy decisions, and assisting stakeholders in making informed choices. As such, a wide range of individuals and organizations, such as students, parents, states, governments, and funding agencies, have a vested interest in school measurements and rankings. Comparing schools offers valuable insights into their strengths and weaknesses, allowing for targeted improvements and fostering healthy competition within the education sector.

The measurement and ranking of schools are essential for assessing the quality of education being provided. By evaluating factors such as academic performance, graduation rates, standardized test scores, and student satisfaction, school systems can gain a comprehensive understanding of their effectiveness. These metrics enable education policymakers to identify areas that need improvement, allocate resources strategically, and develop evidence-based reforms. Moreover, school measurements and rankings provide a benchmark for gauging progress over time, helping to track trends and identify successful practices that can be replicated across different educational institutions.

A diverse range of stakeholders is concerned with school measurements and rankings. Students and parents are directly impacted by the quality of education offered and are keen on ensuring that schools are providing the best possible learning experience. They rely on school rankings to make informed decisions about enrollment and to assess the reputation and competitiveness of educational institutions. State governments and education departments are interested in school measurements as they inform policy decisions related to curriculum development, teacher training, and resource allocation. Funding agencies, both public and private, also pay attention to school rankings to identify schools and programs that deserve financial support, fostering accountability and efficient resource allocation.

Comparing schools holds significant value in the educational landscape. It helps identify exemplary schools that can serve as models for others, encouraging healthy competition and driving continuous improvement. By analyzing the strengths and weaknesses of different schools, educational institutions can learn from one another and adopt best practices to enhance their own teaching methods and student outcomes. Furthermore, comparing schools allows policymakers and education officials to evaluate the impact of educational reforms and policies, promoting evidence-based decision-making. Ultimately, the process of comparing schools contributes to the overall advancement of education systems, providing better educational opportunities for students and ensuring the continuous growth and development of the education sector.

**Analysis and Models**

This section will provide additional information in the data that was used to complete this study, the data preparation & cleaning process, and an overview of the model used to conduct additional analysis.

**About the Data:**

For this study, the team was provided a csv file titled, ‘data-storyteller.csv’ to gain insights about school data. The dataset has a total of 30 observations (rows), and 8 attributes (columns) to help describe the data. The data is organized as follows:

*Figure 1 – Table explaining raw dataset attribute names and datatypes*

|  |  |
| --- | --- |
| Attribute Name | Datatype |
| School | Character |
| Section | Numerical |
| Very Ahead + 5 | Numerical |
| Middling + 0 | Numerical |
| Behind -1-5 | Numerical |
| More Behind – 5-10 | Numerical |
| Very Behind - 11 | Numerical |
| Completed | Numerical |

**Data Preparation & Cleaning:**

Before conducting any form of analysis, the data must be formatted in a way that allows for calculations and analysis to occur. The team imported the csv file into a data analysis platform and inspected how many observations and attributes are in the dataset. Looking at the raw data below, we can see that there are 30 rows and 8 columns:

*Figure 2 – “Storyteller” dataset structure*

A screenshot of a computer

Description automatically generated

From the picture above, the team assessed that datatype conversion is necessary prior to conducting any form of analysis. The team converted all the datatypes to either a factor datatype or integer datatype. The overall purpose of datatype reassignment is to prepare the data for aggregation or calculations. Ensuring that the attributes are in a suitable format will can lead to more accurate results.

*Figure 3 – Table highlighting converted datatypes for each attribute.*

|  |  |
| --- | --- |
| Attribute Name | New Datatype |
| School | Factor |
| Section | Factor |
| Very Ahead + 5 | Integer |
| Middling + 0 | Integer |
| Behind -1-5 | Integer |
| More Behind – 5-10 | Integer |
| Very Behind - 11 | Integer |
| Completed | Integer |

After reassigning the datatypes for each of the 8 attributes, the team viewed the newly formatted data to get preliminary insight on the dataset.

*Figure 4 – View of formatted data*

A screenshot of a table

Description automatically generated

Based on the output provided in Figure 4, viewers can make the following initial observations:

1. School Amount – There are 5 different schools in this dataset.
2. Metrics – there are 6 categories that will serve as metrics in determining a schools rating.
3. Of the six categories, the category of “Very Ahead + 5” has no values for the entire dataset. This alludes to that there is no distinction between a “completed” and “very ahead”. Furthermore, this attribute can be omitted.

**Null or Missing Values:**

There are no missing values in this dataset. However, it is important to reiterate that the entire column of “Very Ahead + 5” contains a value of 0. This suggests that there is no distinction or formalized way to effectively categorize “Completed” students and “Very Ahead” students.

**Baseline Information:**

Before conducting any form of analysis, the team wanted to see how data is dispersed across the five schools. Based on the figure below, we can see that schools A and B contains more sections, and schools C, D and E only has four or less sections. This suggests that schools A and B are larger schools whereas schools C, D, and E are smaller schools.

*Figure 5 – Number of Sections per school*

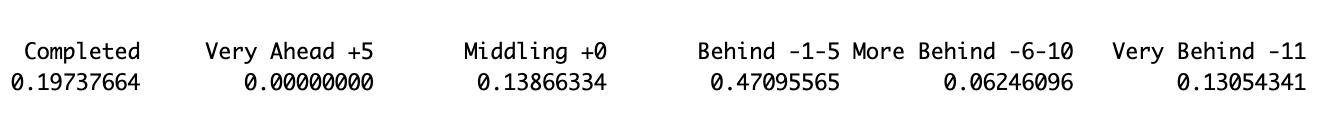
*A graph of a number of sections

Description automatically generated*

**Results**

First, the team determined which categories were most prevalent across the schools. Based on the output below, we can see that 19% of students are categorized as complete, 14% of the student population is categorized as “Middling”, 47% of the students are categorized as behind, approximately 6% of students are categorized as “More Behind” and about 13% of students are considered “Very Behind”. The interesting pattern the team identified is that the majority of the student population amongst these 5 schools are categorized as “Behind”.

*Figure 6 – Percentage breakdown by category*



**School Breakdown Results**

Next, the team wanted to see what the break down per school was. The rationale behind this form of study is to see how each school output can shed light on overall program performance. Below are the bar graphs per school.

*Figure 7 – School Breakdown*

A graph of a bar graph

Description automatically generated

A graph of different sizes of bars

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A graph of a graph of a school

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A graph of a school

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A graph of a bar graph

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The analysis of school data revealed several noteworthy observations. Firstly, schools B and D displayed distinct patterns that differed from the overall data trends. Conversely, schools A, C, and E exhibited consistent patterns in line with Figure 1. School B stood out with a significant number of students surpassing curriculum expectations and completing the program, suggesting a high level of achievement. Conversely, most students who were behind in their assignments across all schools were only lagging by 1-5 assignments, indicating a relatively minor setback. This indicates a generally positive performance across the schools, with school B presenting the most favorable picture. However, school D painted a contrasting picture, with a small percentage of students completing all assignments and a notable proportion considered 'Very Behind'.

These observations could have several implications and potential causes. The high number of students ahead in school B might indicate advanced teaching methods or a particularly motivated student body. The majority of students being only slightly behind across all schools suggests effective instructional strategies and a generally engaged student population. However, the disproportionate number of students 'Very Behind' in school D may point to challenges in the teaching approach, curriculum design, or individual student support. Factors such as inadequate resources, lack of personalized instruction, or external factors impacting student performance might contribute to this situation. Further investigation into the specific practices and circumstances within schools B and D would be necessary to understand the underlying causes and develop appropriate interventions.

**Conclusions**

In conclusion, the analysis of school performance data serves as a critical tool in evaluating the effectiveness of educational systems and facilitating informed decision-making on behalf of parents, students as well as education professionals. Schools play a fundamental role in shaping the educational landscape, and measuring and ranking them provides valuable insights for stakeholders at various levels. This information serves multiple purposes, such as assessing educational outcomes, informing policy decisions, and enabling students, parents, states, governments, and funding agencies to make informed choices.

The observations made during the analysis offer important implications for the schools under scrutiny. School B stands out with a high number of students excelling and completing the curriculum, suggesting the presence of advanced teaching methods or a particularly motivated student body. Conversely, school D presents a concerning scenario with a disproportionate number of students classified as 'Very Behind,' indicating potential challenges in teaching approaches, curriculum design, or individual student support. These findings highlight the need for targeted interventions and further exploration into the specific circumstances of these schools.

By comparing schools and identifying their strengths and weaknesses, the analysis of performance data promotes continuous improvement in the education sector. It enables targeted interventions and the sharing of best practices to address areas of concern, while also fostering healthy competition among schools. This process contributes to enhancing overall educational outcomes, ensuring the success of students, and ultimately shaping a more effective and equitable education system. Continued research and analysis of school performance data remain essential for guiding policy decisions and supporting the ongoing improvement of educational systems worldwide.