IWERC Learning Renewal Dashboard Report

Claudia Robles, Lechen Gong, Yuchien Hung

Overview

The IWERC Learning Renewal Dashboard was designed to visualize trends in educational equity and student outcomes across Illinois school districts. The dashboard integrates cleaned and aggregated data from multiple sources, highlighting correlations and comparisons among key performance indicators (KPIs) such as student attendance, low-income rates, and Evidence-Based Funding (EBF) tiers.

Its primary goal is to support education stakeholders, such as parents, educators, administrators, and students, in identifying achievement gaps, monitoring post-pandemic recovery, and evaluating equity across districts.

1. Data Source

The public datasets are obtained from the Illinois State Board of Education (ISBE) report card data library, and we selected 2019 to 2023 for what to display on the dashboard (excluding 2020 due to data availability).

2. Variable Selection

We selected eight variables for further research at the district level, including:

- The Number of Student Enrollment
- Low Income Rate
- EBF Tier
- Student Attendance Rate
- Chronic Absenteeism Rate
- Student Race Composition
- Average SAT Math Score
- Average SAT Reading Score

The dashboard incorporates these variables as they collectively measure socioeconomic factors, engagement patterns, equity indicators, and academic outcomes. This provides stakeholders with comprehensive yet focused data to identify achievement gaps, evaluate resource allocation effectiveness, and develop targeted interventions that promote educational excellence and equity across our district.

3. Data Processing

We use R to process the data in the public datasets. We first filter each year's dataset to the district level, and then add a `Year` column to each year's dataset. The four years of data are merged through the `RCDTS` column, because the `District Name` may change during the four years, and `RCDTS` is a more stable variable. Finally, we retain the variables we selected on this basis.

The variable `The Number of Student Enrollment` is not conducive to visualization because of its large range, so we choose to set 2019 as the base year and calculate the year-over-year growth rate of student enrollment each year to show the changes before and after the epidemic.

This iteration focuses on enhancing clarity, interactivity, and insight delivery to aid education stakeholders—parents, teachers, administrators, and policymakers—in identifying areas of growth and need.

4. Statistical Analysis of Educational Indicators

A Pearson correlation matrix was computed using district-level data to explore the relationships among key educational performance and equity metrics. The variables analyzed include low-income rate, chronic absenteeism (CA rate), student attendance rate, SAT scores (reading, math, and total), and per-pupil spending. The results reveal several significant trends and associations:

1. Student Characteristics and Academic Performance:
    a. There is a strong negative correlation between the low-income rate and SAT scores (r = -0.73), with similar correlations observed for both reading (r = -0.72) and math (r = -0.71) scores. This suggests that students in districts with higher concentrations of low-income students tend to show lower academic

performance on standardized assessments. However, it is important to recognize that socioeconomic status is just one of many factors that can influence educational outcomes, and structural inequalities, access to resources, and other social factors can play a significant role.

b. Relationship between Student Demographics and Performance
    i. **SAT Reading and Race/Ethnicity:**
        1. % White Enrollment: A weak positive correlation (0.17) with SAT Reading scores.
        2. % Black or African American Enrollment: A moderate negative correlation (-0.46) with SAT Reading scores.
        3. % Hispanic or Latino Enrollment: A weak negative correlation (-0.17) with SAT Reading scores.
        4. % Asian Enrollment: A moderate positive correlation (0.50) with SAT Reading scores.

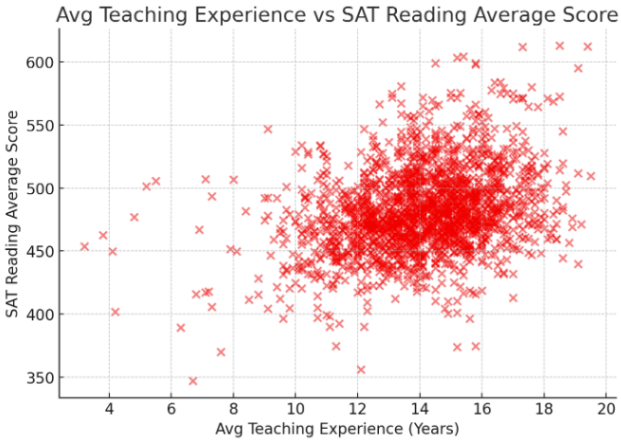
    ii. **SAT Math and Race/Ethnicity:**
        1. % White Enrollment: A weak positive correlation (0.12) with SAT Math scores.
        2. % Black or African American Enrollment: A moderate negative correlation (-0.44) with SAT Math scores.
        3. % Hispanic or Latino Enrollment: A weak negative correlation (-0.12) with SAT Math scores.
        4. % Asian Enrollment: A moderate positive correlation (0.51) with SAT Math scores.

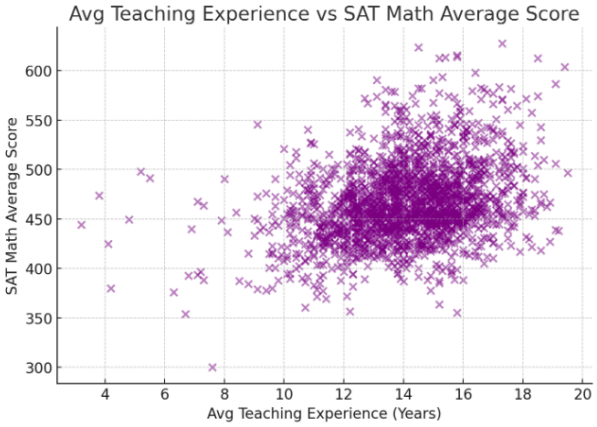
    iii. IAR ELA and Race/Ethnicity:
        1. % White Enrollment: A weak positive correlation (0.26) with IAR ELA proficiency.
        2. % Black or African American Enrollment: A moderate negative correlation (-0.47) with IAR ELA proficiency.
        3. % Hispanic or Latino Enrollment: A weak negative correlation (-0.28) with IAR ELA proficiency.
        4. % Asian Enrollment: A moderate positive correlation (0.38) with IAR ELA proficiency.

    iv. IAR Math and Race/Ethnicity:
        1. % White Enrollment: A weak positive correlation (0.23) with IAR Math proficiency.
        2. % Black or African American Enrollment: A moderate negative correlation (-0.48) with IAR Math proficiency.
        3. % Hispanic or Latino Enrollment: A weak negative correlation (-0.27) with IAR Math proficiency.
        4. % Asian Enrollment: A moderate positive correlation (0.45) with IAR Math proficiency.

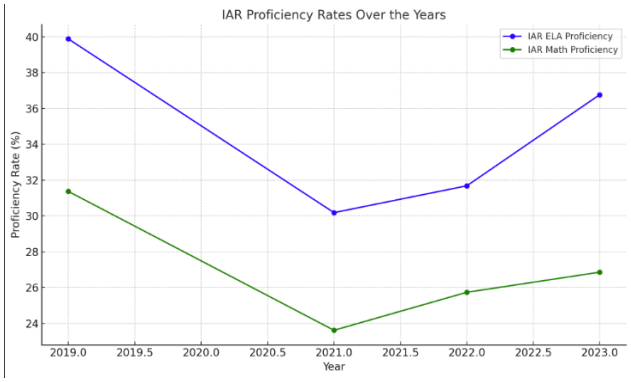
2. Absenteeism and Attendance Impact Academic Outcomes:
    a. The chronic absenteeism rate is strongly negatively correlated with the student attendance rate (r = -0.94), as expected. There is also a moderate negative correlation between absenteeism and SAT scores (r = -0.46), indicating that districts with higher absenteeism tend to have lower academic performance. However, absenteeism is often associated with a range of complex factors, including health issues, family circumstances, and school engagement.

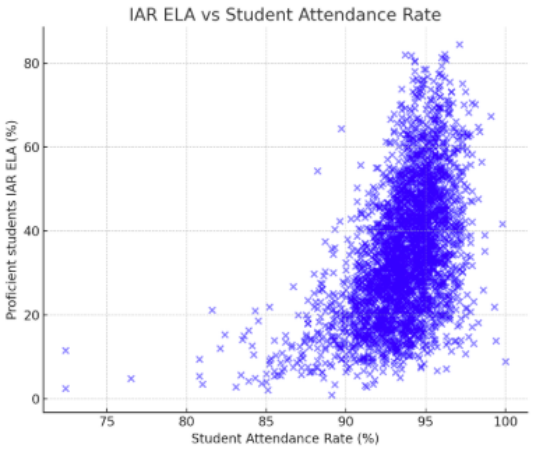
3. Consistency in Academic Performance
    a. There is a moderate positive correlation between average. teaching experience and both SAT reading and SAT math scores (r = 0.31). This suggests that experienced teachers may be associated with better student outcomes, though teaching effectiveness is influenced by a variety of factors, including support, training, and school resources.
    b. Note, no correlation is a finding (for IAR Information)





Exploring IAR performance and the relationship between IAR and Student Attendance Rate

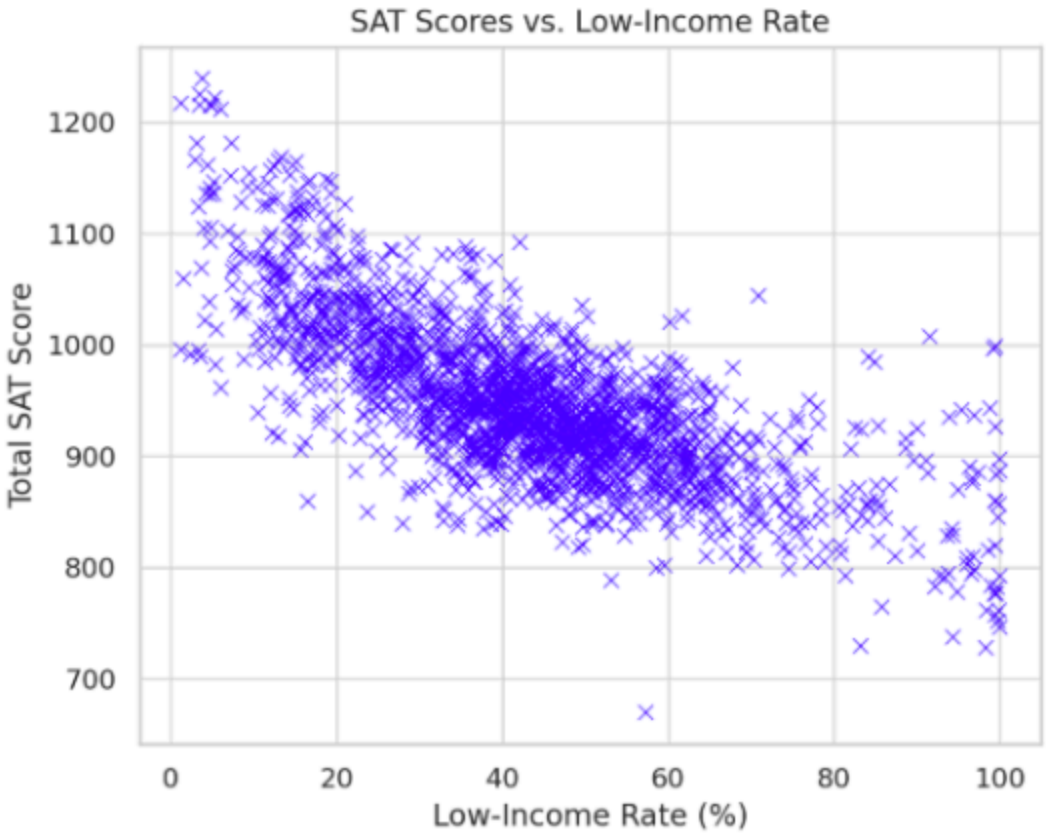




4. Per-Pupil Spending and Outcomes:
    a. Per-pupil expenditures show weak or no meaningful correlation with SAT scores or low-income rates (r ≈ 0.11 with SAT, r ≈ -0.04 with income rate).
        No relationship between IAR and per-pupil spending (weak relationship)
    b. This may suggest that higher spending alone does not guarantee higher academic outcomes and could point to inefficiencies or disparities in how resources are utilized.

5. Visualizations

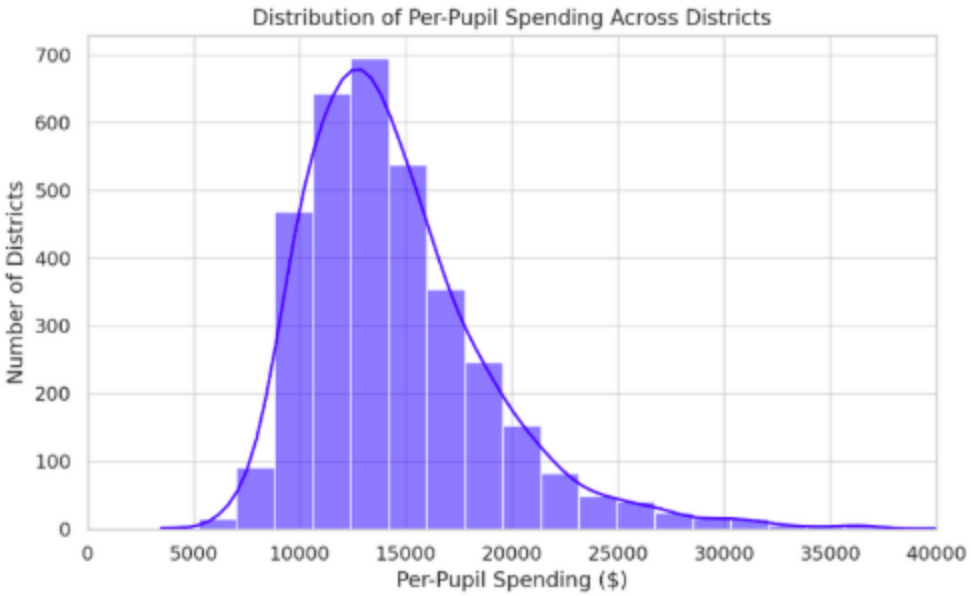
1. SAT Scores vs. Low-Income Rate



- **Insight**: There is a clear **negative correlation** between low-income rate and SAT performance. Districts with higher concentrations of low-income students tend to have lower SAT scores.

- **Implication**: This emphasizes the ongoing academic achievement gap that corresponds with socioeconomic status. These disparities highlight the need for targeted interventions and resource support for underfunded districts.

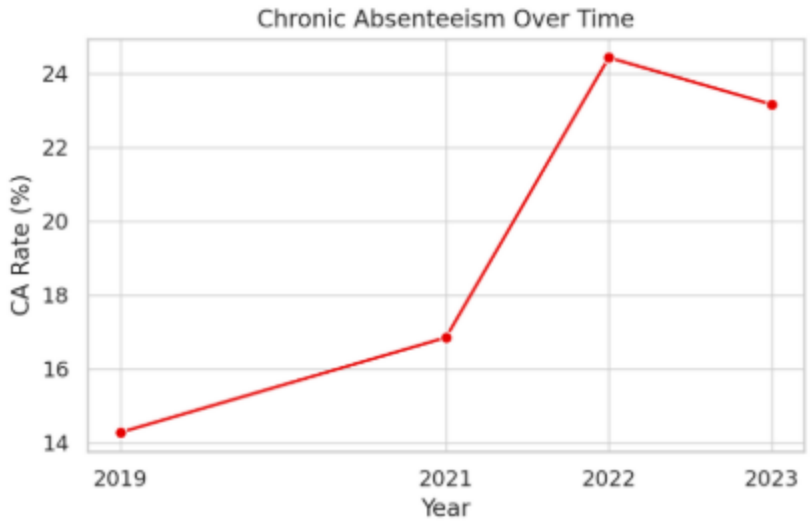
2. Distribution of Per-Pupil Spending



- **Insight**: Per-pupil spending across Illinois districts is right-skewed, with most districts spending between $10,000 and $15,000 per student. A small number of outlier districts spend significantly more.

- **Implication**: While many districts fall within a moderate funding range, the skew suggests large disparities in available resources, which may contribute to inequities in academic opportunity and performance.

3. Chronic Absenteeism Over Time



- **Insight**: Chronic absenteeism has increased sharply from 2019 (14%) to 2022 (24%), with a slight drop in 2023.

- **Implication**: This trend indicates the lasting impact of the COVID-19 pandemic on student engagement. Though there's a modest recovery, the overall rate remains higher than pre-pandemic levels, signaling the need for continued student outreach and attendance recovery strategies.

6. Conclusion