[Digest of Education Statistics-Most Current Digest Tables](https://nces.ed.gov/programs/digest/current_tables.asp)

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Project Title: Impact of Socioeconomic Status on Academic Achievement Across Different States in the U.S.

Problem Statement:

This project aims to explore how socioeconomic status (SES) affects academic achievement across various states in the U.S. We will analyze metrics such as graduation rates, standardized test scores, grades, career outlook, advanced degrees, and access to educational resources, seeking to understand how differences in SES contribute to educational outcomes.

Data Sources:

1. Education Data: Data from the National Center for Education Statistics (NCES) regarding graduation rates, standardized test scores, and other academic metrics for different states.

2. Socioeconomic Data: U.S. Census Bureau data on income levels, poverty rates, and demographic information for each state to correlate with academic achievement.

3. Educational Resources Data: Information on school funding, teacher-to-student ratios, and access to extracurricular activities, which may be available through state education departments or the NCES.

Potential Sources:

* National Center for Education Statistics (NCES) - [NCES Data](<https://nces.ed.gov>)
  + Educational Resources Data: [Table 3.–Number of students receiving educational services, by state and district charter status: School years 2005–06 through 2009–10](https://nces.ed.gov/ccd/tables/table_3_State_and_District_Charter.asp)
* U.S. Census Bureau - [Census Data](<https://www.census.gov>)
* Bureau of Economic Analysis- [Income Data]([BEA: Download ZIP Files](https://apps.bea.gov/regional/downloadzip.htm) - Annual Personal Income and employment by state)
* Economic Research Service - US Department of Agriculture - [Educational Attainment] <https://www.ers.usda.gov/webdocs/DataFiles/48747/Education.xlsx?v=2269.2>
* State Education Departments for localized data on educational resources.
* [U.S. Department of Education appropriations for major programs, by state or jurisdiction: Fiscal year 2021](https://nces.ed.gov/programs/digest/d23/tables/dt23_401.60.asp?current=yes)
* [Unemployment](https://data.ers.usda.gov/reports.aspx?ID=17828) - Unemployment Rate and Median Household Income (from 2014 - 2022)
* Percent of public schools that are rural in each state - Schools located in places the U.S. Census Bureau classifies as rural

Ethical Considerations:

Ethical considerations include ensuring that data is used responsibly and that no personally identifiable information (PII) is disclosed. It is also essential to acknowledge the potential biases inherent in data collection, particularly regarding how socioeconomic status (SES) impacts educational opportunities and outcomes. Additionally, care should be taken to document any response bias and ensure that the data collected is representative of the entire state population rather than being skewed by a selective region.

One thing to consider with considering standardized test scores as a factor is that they have been seen to disproportionately negatively affect students of color. It has been shown to reflect cultural, linguistic, and socioeconomic biases.

Goals of Analysis:

The goal is to develop an understanding of the relationship between socioeconomic status and academic achievement, aiming to identify key factors that contribute to disparities. We hypothesize that:

“Higher socioeconomic status is positively correlated with higher academic achievement, with disparities evident across different states.”

Success will be measured by:

* Correlation coefficients indicating the strength and direction of relationships between SES and academic metrics.
* Visualizations that illustrate disparities in academic achievement based on SES across states.

Data Science Algorithms:

1. Correlation Analysis: To explore the relationships between SES and academic achievement metrics.

2. Regression Models: To predict academic achievement based on socioeconomic factors.

* Linear Regression
* Logistic Regression

3. Clustering Algorithms: To group states based on similar SES and academic achievement profiles for comparative analysis.

Division of Labor:

* Abigail: Responsible for collecting and cleaning education and socioeconomic data from the NCES and U.S. Census Bureau, and conducting initial statistical analysis and defining the units of measurement for our project.
  + *Are states with a larger personal income more likely to pursue advanced degrees? How does this change throughout different years?*
  + *How does access to other educational resources affect this?*
* Isabella: In charge of performing data analysis and developing regression models to assess the relationship between SES and academic outcomes, focusing on the questions:
  + *How does the allocation of funding impact student academic achievement across states?*
  + *How does access to advanced coursework (e.x. AP classes) vary by socioeconomic status, and what is its impact on academic achievement?*
* Elda: Focuses on evaluating results and preparing visualizations to present insights regarding educational disparities across states.
  + How do funding disparities between schools in different socioeconomic areas impact students’ learning experiences?
  + What are the differences between urban and rural schools and the correlations with academic achievement? If that's pursuing higher education or national test scores.
* Group: Analyze findings and insights to prove/refute our hypothesis and collectively present a conclusion of our work.