Correlation Between Dollars Spent per Student and Graduation Rates

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Title

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Abstract

This research article investigates the relationship between district funding and graduation rates in four diverse counties in Florida. The authors, with their varied teaching backgrounds in Pinellas County, sought to better understand the impact of funding on student success. Drawing upon data from the Florida Department of Education's data portal, graduation rates, per student expenditures, and enrollment data were collected for each specified district. The study also utilized the American Community Survey to gather additional information on household median income, total number of households, households with children under 18, and the distribution percentage of households with children under 18 within each district. By examining these factors, the research aims to determine whether district funding can serve as an accurate predictor of positive graduation rates. The findings from this study contribute to the ongoing discourse on the relationship between educational funding and student outcomes, shedding light on the potential for success even with reduced expenditure

per student.

3 Keywords

Per pupil funding equity, success cost, district success advantages

### Introduction/Phenomena of interest

We chose to focus our data analysis on the issue of whether district funding would be an accurate predictor of positive graduation rates. We both have history teaching in Pinellas County but have different backgrounds. This motivated us to want to find a better understanding of this relationship. Erin taught for years in private schools that served both low-income families, and then later a more affluent population. Both environments relied on tuition paying families for enrollment and annual budgets. There was always a very tenable balance between the maximum tuition cost and the reinvestment into the program that left very little discretionary budget room. Over the years the devoted educators in these schools worked very hard with a lot less to advance the students in their care. The interest in the relationship between funding and success originated with the belief that it is possible to be successful even with a reduced expenditure per student.

Alan taught at a Title 1 high school in Pinellas County Schools before transitioning to a highperforming technical college in Sarasota County Schools. The primary focus was to understand the factors contributing to differences in student performance between the two counties. In Sarasota County, with its smaller population, smaller class sizes were observed alongside higher expenditures per student. This prompted an investigation into the relationship between district size, per student spending, and student graduation rates. The central question revolved around identifying the potential linkages between these variables.

On average the United States allocates approximately 3.7 percent of its GDP to public K-12 education, historically relying on local revenue for funding, primarily through local property taxes

(Miller, 2018, p. 1). The dependence on property taxes has led to notable inequalities in school funding among districts, primarily influenced by varying income levels and property wealth. To address the constitutional concerns raised by court rulings regarding these disparities, numerous states introduced funding formulas during the 1970s and 1980s. These formulas aimed to equalize the allocation of funds across districts by diminishing the impact of local property values on school resources. As a result, these funding reforms, which often take property values into account to provide more support to districts with lower property wealth, have demonstrated positive associations with high school completion rates, long-term outcomes, and student test scores in recent research.

Furthermore, it is important to consider the impact of Florida's Small School Law on the relationship between district funding and graduation rates. According to Florida Statutes, this legislation, enacted in 2001, aimed to promote smaller class sizes by imposing strict limits on the number of students per classroom. As a result, districts had to allocate additional resources to accommodate the smaller class sizes, potentially affecting the overall distribution of funding. The underlying assumption behind this law is that smaller schools and classrooms lead to better student learning outcomes. Consequently, it is reasonable to explore whether smaller districts, influenced by the Small School Law, may also reflect improved educational outcomes. Therefore, this study seeks to investigate the interplay between district funding, graduation rates, and the implications of legislation, such as the Small School Law, to comprehensively understand the factors that influence educational outcomes in the selected counties.

By delving into these issues, this research aims to contribute to the existing discourse on the interplay between district funding and student outcomes. The findings from this study have the

potential to shed light on the complex dynamics involved in educational funding and their impact on

graduation rates, providing valuable insights for policymakers, educators, and researchers alike.

#### Data source

The primary data source used for this project was the Florida Department of Education's data portal. This data portal serves as a comprehensive repository of education-related information for the state of Florida. It provides access to various datasets and reports, covering a wide range of educational indicators and metrics. The researchers were able to obtain graduation rates, per student expenditures, and enrollment data by specified district. Within the study, four counties were selected that represented a diverse range of districts based on district population size and household income. The researchers accessed graduation rates, per student expenditures, and enrollment data specific to each district through the Florida Department of Education's data portal. These data points are crucial for examining the relationship between district funding and graduation rates. By leveraging this data source, the researchers were able to gather detailed and reliable information on educational outcomes and financial resources at the district level.

Additionally, the American Community Survey (ACS) was used to provide data by district on the household median household income, total number of households, households with children under 18 and the district distribution percentage of households with children under 18. The ACS is an ongoing survey conducted by the U.S. Census Bureau that collects data on various social, economic, and housing characteristics of individuals and households across the United States. Furthermore, the ACS serves as a valuable data source for providing demographic and socioeconomic information at the district level. This integration of demographic and economic data from the ACS enhances the depth and breadth of the analysis, providing a more holistic understanding of the factors influencing educational outcomes within the selected districts.

# Florida Department of Education: Know Your Schools United States Census Bureau's American Community Survey (ACS)

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## Table of variables examined:

Name of variable	Type of variable [quantitative, qualitative]	Level of variable [nominal, ordinal, interval, ratio]
Graduation rates by district	Quantitative	Interval
District per student expenditures	Quantitative	interval
PK-12 enrollment by district	Quantitative	Interval
Median income by district	Quantitative	Interval
Total households by district	Quantitative	interval
Families with children under 18	Quantitative	interval
by district		
Households with children	Quantitative	Ratio
under 18 distribution		
percentage of total households		

### Methods

### Participants

The participants in this study were four distinctly chosen school districts within the state of Florida. These four diverse counties were selected based on their district population size and household income. For this study, the specific counties chosen for analysis included Marion, Pinellas, Polk, and Sarasota. These counties were ultimately picked because they provided a representative sample of districts with specific varying characteristics. This allowed for a comprehensive examination of the relationship between district funding and graduation rates. Upon examining student enrollment numbers and per student expenditures, the four counties were categorized based on size and wealth into the following groups: Marion - small and not wealthy, Pinellas - large and wealthy, Polk - large and not wealthy, and Sarasota - small and wealthy.

## Data Collection

Two primary data sources were mainly used for this study. Those were the Florida Department of Education's data portal and the U.S. Census Bureau's American Community Survey. First off, the Florida Department of Education's data portal was used to provide access to graduation rates, per student expenditures, and enrollment data specific to each district that was chosen within the state. These variables were collected for the five academic years beginning with 2017-18 through and ending 2021-22. These years were the most current years where data was available. Next, the American Community Survey was used to gather additional data by district on household median income, total number of households, households with children under 18, and the district distribution percentage of households with children under 18.

### Data Analysis

Several steps were taken within the data analysis process to examine the relationship between district funding per student and graduation rates. First off, descriptive statistics, including the mean, median, and range, were calculated for each district's graduation rate. These statistics provided a summary of the distribution of graduation rates across the four counties, which allowed for a better understanding of the variation in educational outcomes.

Chiefly, the range represents the difference between the highest and lowest graduation rates in each district. Calculating the range added valuable insights to the data analysis. Firstly, it helped in understanding the variability in graduation outcomes between districts. A larger range typically indicates a wider spread of graduation rates, highlighting greater variability and diversity in educational performance across districts. Secondly, the range facilitated the identification of potential outliers within the dataset. Outliers, represented by exceptionally high or low graduation rates, could be further examined to determine their impact on the overall results or to investigate specific factors contributing to these unique outcomes.

Furthermore, the graduation rate range provides valuable information for the data analysis of the districts. As shown in Table 2, the four districts had ranges of 5.3 for Marion County, 6 for Pinellas County, 8.2 for Polk County, and 3.6 for Sarasota County. The range of graduation rates indicates the spread of values within each district. Because a larger range suggests a wider variation in graduation outcomes, within this context, Polk County has the largest range of 8.2, indicating a wider spread of graduation rates compared to the other districts. On the other hand, Sarasota County has the smallest range of 3.6, suggesting a more concentrated range of graduation rates.

Further information is provided in Table 6, which examines the mean, median and range of district enrollment numbers. When comparing district graduation ranges to district enrollment ranges, there are a few different conclusions that can be drawn. The enrollment ranges likely indirectly influence graduation rates. Larger districts with higher enrollment ranges may face different challenges and dynamics compared to smaller districts. Factors such as class size, teacher-student ratios, and individualized attention may vary across districts with different enrollment ranges. These factors, in turn, can impact educational outcomes, potentially affecting graduation rates. It is noteworthy that Pinellas County, which had the highest enrollment range, also had a relatively higher graduation rate range of 6. This finding suggests that a larger student population does not necessarily correlate with lower graduation rates. Conversely, Polk County, with a comparable enrollment range to Pinellas, exhibited a wider graduation rate range of 8.2. This disparity suggests that additional factors beyond enrollment may influence graduation outcomes within districts. Further analysis and exploration of these factors will be valuable in understanding the nuanced relationship between enrollment, district characteristics, and graduation rates.

Table 4 examines the mean, median, and range of district per student expenditures. Upon examination, it appears that there may be some correlation between the ranges of student expenditures and graduation rates. Pinellas County had the highest range for student expenditures (\$2035) and the second highest range for graduation rates (6), which suggests a possible positive association between higher funding and higher graduation rates. On the other hand, Marion County had the lowest range for student expenditures (\$1586) and one of the lower graduation rate ranges (5.3), indicating a potential negative correlation. The most important conclusion to draw is to recognize that the impact of per student spending on graduation rates is not solely determined by the amount spent. The effective allocation and utilization of resources, regardless of the funding level, most certainly play a crucial role in increasing district graduation rates. Districts that strategically allocate their resources, regardless of their size, can potentially achieve positive outcomes in graduation rates by focusing on effective teaching strategies, targeted interventions, and comprehensive support systems for students.

Additionally, correlational analyses were conducted to explore the relationships between per student expenditures and graduation rates. The strength and direction of the correlation were examined using appropriate statistical measures. This analysis aimed to determine whether district funding or district size served as an accurate predictor of positive graduation rates.

Furthermore, the relationships between household characteristics, such as median income, total number of households, households with children under 18, and the district distribution percentage of households with children under 18, were examined. These variables were explored to understand how they may influence district funding and subsequently impact graduation rates.

The data analysis process involved utilizing statistical examination to perform the necessary calculations and generate meaningful insights from the collected data. The findings derived from these analyses contribute to a comprehensive understanding of the relationship between district funding, household characteristics, and graduation rates, thereby providing valuable insights for educational policymakers.

## Table 1

# Graduation rates by district

Graduation Year	Marion	Pinellas	Polk	Sarasota	
2017-18	81.8	86.00	80.40	89.80	
2018-19	83.8	88.40	81.20	89.40	
2019-20	87.1	91.50	86.50	92.50	
2020-21	86.5	92.00	85.30	91.00	
2021-22	83.5	88.10	78.30	88.90	

*Notes:* Four counties were selected for analysis, two of which have large enrollments (Pinellas, Polk) and two of which have small enrollments (Marion, Sarasota).

## Table 2

# Graduation rate descriptive statistics

	Marion	Pinellas	Polk	Sarasota
Mean	84.54	89.20	82.34	90.32
Median	83.8	88.4	81.2	89.8
Range	5.3	6	8.2	3.6

## Table 3

# District per student expenditures

Graduation Year	Marion	Pinellas	Polk	Sarasota
2017-18	\$ 7,805.00	\$ 8,622.00	\$ 8,101.00	\$ 10,035.00
2018-19	\$ 8,252.00	\$ 8,973.00	\$ 8,313.00	\$ 10,318.00
2019-20	\$ 8,265.00	\$ 9,254.00	\$ 8,339.00	\$ 10,549.00
2020-21	\$ 9,013.00	\$ 10,218.00	\$ 8,820.00	\$ 11,205.00
2021-22	\$ 9,391.00	\$ 10,657.00	\$ 9,637.00	\$ 11,574.00

	Marion	Pinellas	Polk	Sarasota
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Mean	\$ 8,545.20	\$ 9,544.80	\$ 8,642.00	\$ 10,736.20
Median	\$ 8,265.00	\$ 9,254.00	\$ 8,339.00	\$ 10,549.00
Range	\$ 1,586.00	\$ 2,035.00	\$ 1,536.00	\$ 1,539.00
Table 5 PK-12 enrollment µ	per district			
Table 5 <i>PK-12 enrollment µ</i> Graduation Year	<b>per district</b> Marion	Pinellas	Polk	Sarasota
Table 5 <i>PK-12 enrollment µ</i> Graduation Year 2017-18	<b>ber district</b> Marion 43,119	Pinellas 101,824	Polk 104,136	Sarasota 42,901
Table 5PK-12 enrollment pGraduation Year2017-182018-19	<b>Der district</b> Marion 43,119 42,941	Pinellas 101,824 100,987	Polk 104,136 105,673	Sarasota 42,901 43,119
Fable 5     PK-12 enrollment p     Graduation Year     2017-18     2018-19     2019-20	Der district Marion 43,119 42,941 43,273	Pinellas 101,824 100,987 99,798	Polk 104,136 105,673 107,696	Sarasota 42,901 43,119 43,498
Fable 5   PK-12 enrollment p   Graduation Year   2017-18   2018-19   2019-20   2020-21	Der district Marion 43,119 42,941 43,273 41,177	Pinellas 101,824 100,987 99,798 96,068	Polk 104,136 105,673 107,696 105,368	Sarasota 42,901 43,119 43,498 42,618

Table 6

# PK-12 enrollment per district descriptive statistics

	Marion	Pinellas	Polk	Sarasota
Mean	42,637.6	98,824.6	106,625.2	43,206.4
Median	42,941	99,798	105,673	43,119
Range	2,096	6,378	6,117	1,278

# Table 7

# Median income by district

Year	Marion	Pinellas	Polk	Sarasota
2021	\$55,161	\$61,947	\$56,379	\$71,761

# Table 8

# 2021 Households by district

	Marion	Pinellas	Polk	Sarasota	
Total Households	157,348	419,798	276,469	204,018	
Number of families with	29,175	64,765	70,808	28,832	
children under 18					
% Distribution	27.6%	28%	37.8%	23.5%	

References:

FLDOE. (n.d.). https://edudata.fldoe.org/index.html

American Community Survey (n.d.) <u>https://www.census.gov/programs-surveys/acs/</u>







### Interpretation of data

There were some interesting discoveries derived from the data in this project. The work began with the general assumption that there was a direct correlation between the cost spent per student and the success rate, where more spending would result in a greater level of success. While there is absolutely some truth to that notion, the data revealed that this is not the only influential factor.

Sarasota County stood out as the highest in nearly every metric analyzed. That county had the highest per student expenditure, the highest graduation rate, and the highest district income level. Perhaps not so surprisingly, despite the year-over-year increases in spending per student, the graduation rate in Sarasota County dropped from 2017-18 to 2021-22. While it may be tempting to attribute this decline to the impact of the COVID-19 pandemic, the data showed that two other counties in the analysis, including the least wealthy district, Marion County, managed to increase their graduation rates over the same period.

When comparing the two less wealthy districts, Marion and Polk, the data provided some thought-provoking considerations. The district per student expenditures in these two counties was within about \$100 of each other and the mean graduation rate was significantly lower than Sarasota and Pinellas. However, it was interesting to note that while the graduation rates of Polk and Sarasota counties declined over the five-year period, Marion and Pinellas counties showed an upward trend.

Another interesting finding was the contrast between Polk County and the comparatively wealthier districts, Pinellas, and Sarasota. Polk County spent significantly less per student, yet had a higher enrollment compared to Sarasota and slightly higher than Pinellas. The median household income in Polk County was \$5,558 lower than Pinellas and \$15,382 lower than Sarasota. Although Polk County experienced a slight drop in the graduation rate, the enrollment numbers showed a significant increase.

The data presented a different story for Marion County. Being the poorest district in the dataset, Marion County, with a median income of \$55,161, showed relatively consistent enrollment numbers over the years, without experiencing the enrollment increases seen in Polk County. Among the four districts evaluated, Marion had the lowest expenditures per student, which was significantly lower than Pinellas and Sarasota. Despite the challenges, Marion County managed to increase its graduation rate from 81.8 in 2017-18 to 83.5 in 2021-2022.

While the initial review of the data suggests a correlation between spending money on students and their level of success, as seen in Sarasota and Pinellas, it became evident that there are other factors at play. According to the data, Sarasota seemingly has every advantage with the highest median income and the lowest ratio of families with children to total households. This would suggest these students benefit from the surplus tax revenue the other households contribute to the support of schools, but it also indicates these children have exposure to a greater number of high-earning, most likely college educated adults. Marion, on the other hand, defies this presumption as the poorest and among the smallest district, with the lowest spending per student, yet still managed to raise its graduation rate over the five-year period. Another noteworthy fact is that according to the Marion school district's website, their goal is to elevate their students' performance to be within the top third of Florida's districts. More research is required to determine if they have a successful plan in place and if these results can be replicated otherwise throughout the state. Considering these findings, it is evident that other factors such as teacher experience, parent

involvement, and enrichment programs tailored to different learning needs or English language

learners should be evaluated as possible contributors to student success.

### Implications

Through this research, the consensus is that the graduation rate is only influenced in part by the per student expenditures and the district size. The issue of graduation rates and the factors that influence them is complex and requires further investigation. A recent study by Richard J. Munrane examined various factors impacting graduation rates, including the racial/ethnic gap, socioeconomic status, gender gap, and deviations in reporting GEP data. The evidence supported these factors as contributors to fluctuations in graduation rates. The data points to the graduation rate being influenced by the per student expenditures as well as the district size in connection with many other interrelated factors. The fundamental question that needs to be analyzed is why graduation rates increase more in some districts over others. To answer that question, analysis should be used as the foundation to propel further investigation.

One area that deserves deeper exploration is the data revealing graduation rates based on socioeconomic status. Munrane (2013) found that "the graduation rate is 31 percent lower for children in the lowest SES quartile than for children in the top quartile" (p. 386). The data showed the district with the highest median income exhibited the highest graduation rate. It is worth considering the implications of redirecting some of the funding to address the early educational needs of low-income families.

Another aspect to evaluate is the data pertaining to the racial/ethnic gap in graduation rates. What factors contribute to the lower graduation rate with these students? Would they benefit from additional support of programs that enhance learning English as a second language? Are these students at risk due to lower socioeconomic backgrounds or belonging to migrant families who could benefit from related support interventions? Further analysis of these factors is essential to understanding student success.

Finally, differences between districts, beyond funding and size, should also be examined. Factors such as the quality of educators, educational support programs within the district, and the sense of community fostered among educators, administrators, and parents should be considered. These

factors significantly all impact a child's educational experience which influences graduation rates. Psychologists have found that underdeveloped brain development in many teenagers who drop out of school leads to a higher value placed on risk-taking experiences, making it more challenging to succeed academically (Munrane, 2013, p. 388). Understanding which schools have effective programs, dedicated educators, and a supportive community can help address the needs of at-risk students.

The research intended to answer whether a smaller district enrollment size or spending per student made a more positive impact on student success as shown through graduation rates. The data showed that it was possible to increase graduation rates in both a less wealthy or an affluent district with relative spending per student. The data also demonstrated that less wealthy or wealthy districts of varying population levels were capable of lowering graduation rates regardless of expenditure per pupil. Although the initial question was not answered outright, valuable and foundational insight was gained that sparked new unanswered questions, which can be analyzed to continue understanding and developing growth of graduation rates in Florida's school districts. It would be helpful if the original database had the capability of sorting graduation rates by population demographics to assist in answering subsequent questions when researching these new questions.

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