

The Effect of Teachers' Starting Salary on the Academic Performance of Students in the State of Pennsylvania

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Abstract: *Teacher quality is a fundamental element of student success, yet Pennsylvania faces significant disparities in teacher compensation driven by reliance on local property taxes for school funding. These inequities create challenges in recruiting and retaining qualified educators, particularly in economically disadvantaged districts, potentially widening the achievement gap. This quantitative study investigated the relationship between teachers' beginning salaries and student academic performance within 92 public school districts in southeastern Pennsylvania. Grounded in Human Capital Theory, the researcher examined the extent to which financial investment in entry-level educator compensation correlates with measurable student academic outcomes. The study employed a non-experimental, correlational research design utilizing secondary data from the 2016-2017, 2017-2018, and 2018-2019 academic years. This timeframe was selected to analyze trends prior to the disruptions caused by the global coronavirus pandemic. The data sets included variables such as district starting salaries, graduation rates, and standardized assessment scores in mathematics and English language arts. Additionally, the Adjusted Act 1 Index was utilized to stratify districts into "Wealthy" and "Economically Disadvantaged" tiers, accounting for the financial health and socioeconomic status of the districts being studied. Statistical analyses, including correlation matrices and Ordinary Least Squares regression, were conducted to evaluate the strength and direction of these relationships. The results indicated a statistically significant positive correlation between higher starting teacher salaries and improved student graduation rates and standardized test proficiency. At the same time, the analysis revealed a strong, statistically significant negative relationship between district financial constraints and academic performance, suggesting that socioeconomic factors heavily influence educational outcomes. The findings imply that while competitive compensation is associated with student success, it is deeply intertwined with the broader economic context of the school district. Conclusions drawn from this study suggest that addressing educational inequities requires comprehensive policy reforms. Recommendations include revising state funding models to support underfunded districts and strategically increasing starting salaries to attract high-quality educators, aiming to provide all students equitable educational opportunities, regardless of their geographic or economic background.*

Keywords: educational equity, human capital theory, school finance, starting teacher salary, student academic performance

1. Impact of Starting Teacher Salary on Pennsylvania Student Academic Performance

1.1 Background

1) Overview of the Topic

Education is essential for individual and societal advancement, with teacher quality being a significant determinant of student success. The quality of education that students receive is directly tied to their academic performance, which influences their future career opportunities, income levels and overall well-being (Rudolf & Lee, 2023). Supporting this, the University of Miami (2014) indicated that a one-point increase in high school GPA raises annual earnings in adulthood by approximately 12% for men and 14% for women. In this context, it cannot be ignored that teachers are fundamental to the education system, serving as primary catalysts for student achievement. Ekmekeci and Serrano (2022) highlighted that teacher quality significantly affects student learning outcomes, with access to highly qualified teachers correlating with higher rates of student success. This indicates a direct link between teacher quality and student success "both short-term (class grades) and long-term (higher lifetime earnings)". How can we improve teacher quality?

One way to enhance teacher quality is through competitive compensation, as higher salaries can attract and retain skilled educators. For instance, the Teacher Task Force (2020) found that a 10% increase in teacher pay leads to a 5-10% rise in student performance. Additionally, Neves (2025) demonstrated that higher teacher salaries are associated with increased graduation rates across 46 U.S. states, including New York, California and Massachusetts, further supporting the positive impact of competitive compensation on student achievement. Beyond salary increases, Stone and Peetz (2023) reported that performance-based pay programs have been linked to higher retention rates of effective teachers, thereby enhancing overall educational quality.

Despite this evidence, in Pennsylvania, disparities in teacher salaries due to funding inequities raise concerns about educational equity and student performance (Lapp & Shaw-Amoah, 2023). These inequalities are responsible for differences in school resources, teacher turnover and student achievement, and they fall disproportionately on poorly funded districts. Lapp and Shaw-Amoah (2023) also reported that Pennsylvania has one of the most unequal public-school systems in the U.S., with the largest differences in school funding, educational opportunity and student academic performance. Addressing these disparities is crucial to ensure that all students, regardless of their socioeconomic background, should have access to high-quality education.

2) Context of the Study

Teacher salaries in developed countries like the U.S. vary widely due to interconnected factors such as state budgets, local funding mechanisms and district-specific policies (Shuo, 2021; Woolcock, 2024). In most professions (such as software engineering, finance, medicine, etc.), wages are influenced by market forces, such as supply and demand. However, in Pennsylvania K-12 public education, teacher pay is largely influenced by collective bargaining agreements and state-level regulations rather than market-driven wages, leading to significant disparities, especially for new teachers (Graham, 2022). In Pennsylvania, these disparities are evident due to the State's heavy reliance on local property taxes to fund K-12 public education, allowing wealthier districts to offer higher salaries while underfunded districts struggle to remain competitive, leaving poorer districts to face teacher shortages and retention challenges.

While Pennsylvania's average teacher salary reached \$71,479 during the 2020-2021 academic year, significant disparities persisted (Allegheny Institute for Public Policy, 2017; Commonwealth Foundation, 2023; Heinze, 2017). For instance, the 2016-2017 study data highlights that, between the following districts, District 77 teachers earned an average of \$99,235 (starting at \$54,508) (District 77 & District 77 Education Association, 2017) while nearby District 84 teachers earned an average of \$58,063 (starting at \$44,000), \$41,172 less (District 84 & Federation of District 84 Teachers, 2016). Salary differences such as this highlight the significant pay gaps within southeastern Pennsylvania (Allegheny Institute for Public Policy, 2017; Commonwealth Foundation, 2023; Heinze, 2017). The existing funding model exacerbates disparities, with urban districts often constrained by budget limitations while affluent suburban areas benefit from greater revenues and resources. To achieve equity, underfunded Pennsylvania schools would need 11,000 additional teachers and \$2.6 billion in salaries to match the staffing levels of adequately funded districts (Lapp & Shaw-Amoah, 2023). Addressing these inequities is crucial to ensuring all students, regardless of background, have access to quality education and qualified teachers.

3) Significance of the Issue

Teacher compensation has been a topic of ongoing debate. The Teacher Task Force (2020) suggested that higher teacher salaries lead to improved student outcomes, as competitive pay helps attract more effective educators. Stone and Peetz (2023) found that nearly 40 studies examining performance pay programs found a significant, and positive, overall impact of merit pay for teachers and on student performance, measured in standardized test scores. The question of whether increasing teacher salaries directly enhances student achievement remains a pressing concern for policymakers and educational leaders. Pennsylvania, like many other states, faces a growing teacher shortage. The Penn State College of Education (2024) study noted that the number of newly certified teachers in Pennsylvania has declined by 74% since 2012, reaching critical levels of staffing and teacher shortages.

LaMar (2024) also reported that in the most recent school year, Pennsylvania saw a historic shift where Emergency Permits issued to fill teaching positions outnumbered newly

certified teachers for the first time in Pennsylvania's history. This teacher shortage has led to increased class sizes, fewer planning periods for teachers and overall declines in instructional quality. A well-compensated teaching workforce is associated with higher teacher retention rates, improved job satisfaction and better student performance (Carver-Thomas & Darling-Hammond, 2019). According to García and Han (2022), competitive teacher salaries

enhance retention and instructional effectiveness, leading to better student outcomes, while lower salaries contribute to higher teacher turnover, disrupting classroom stability and negatively impacting student academic performance. Therefore, ensuring competitive compensation is essential for maintaining a stable and effective teaching workforce, ultimately benefiting student outcomes.

4) Policy and Practical Implications

Increasing teacher starting salaries is pivotal in attracting and retaining qualified educators. Frahm and Cianca (2021) indicated that higher salaries can enhance teacher retention rates, which, in turn, positively impact student achievement. This means that regions offering lower starting salaries often struggle with high turnover rates, leading to instability in the classroom and negatively affecting student learning experiences. In Pennsylvania, the Act 1 Index, established by the Taxpayer Relief Act of 2006, sets a cap on the amount a school district can raise property taxes without first obtaining voter approval via referendum, a complex and usually unsuccessful process, as voters simply do not vote to increase their own school taxes greater than their adjusted Act 1 Index. (Welton, 2015). This cap is calculated annually based on a Statewide Average Weekly Wage (SAWW) and the Employment Cost Index (ECI), allowing districts to address standard inflationary pressures. However, the adjusted Act 1 Index, applied to certain districts with lower wealth or higher expenditure needs, offers a slightly higher cap to accommodate their fiscal challenges. Despite this adjustment, many underfunded districts still struggle to generate sufficient revenue under the constraints of the index. As a result, they may be unable to offer competitive salaries, which hinders their efforts to attract and retain qualified teachers.

In response to challenges in attracting and retaining qualified educators, Pennsylvania lawmakers have introduced legislation aimed at increasing teacher compensation. House Bill 688 (2023) or the 2023-2024 Regular Session proposed establishing the Pennsylvania Teacher Pipeline Scholarship Program to support individuals pursuing teaching careers, thereby aiming to address the teacher shortage. In the same year, Senate Bill 300 (2023) was introduced, focused on enhancing data transparency and establishing the Educator Pipeline Support Grant Program to strengthen the educator workforce. These legislative actions emphasized the understanding that teacher salary, and support are necessary elements in securing educational quality. Podolsky et al. (2016) identified competitive starting salaries and supportive initiatives as requirements to draw and maintain competent educators, directly impacting student achievement. Reforming educational funding structures and enacting supportive legislation represent important steps that may help districts offer more competitive compensation and

resources, with the potential to contribute to improved educational outcomes across the state.

While the recent legislative actions in Pennsylvania show promise in addressing teacher shortages and retention, their success will depend on sustained funding and comprehensive reforms. The actions taken today may provide immediate relief, but for long-term solutions, a broader approach that addresses educational funding inequities and ongoing support for teachers will be necessary. The future will likely reveal whether these measures are sufficient to create a stable and effective teaching workforce across the State.

1.2 Statement of the Problem

The issue studied by this research was the huge inequality in teacher pay among Pennsylvania school districts, which creates difficulties in retaining and recruiting high quality educators, further impacting student academic performance. Although Pennsylvania had an average teacher salary of \$71,479 in 2020-2021, there were significant variations, notably when it comes to starting salaries (Commonwealth Foundation, 2023). For example, in southeastern Pennsylvania, District 28 of County B had a starting salary of \$43,000 while District 61 of County E had \$56,393 in 2020-2021 (Americans for Fair Treatment, 2024). These disparities stemmed primarily from Pennsylvania's dependence on local property taxes for educational funding, enabling more affluent districts to pay better salaries while leaving poorly funded districts unable to compete. As previously mentioned, this funding system perpetuates disparities, as underfunded districts, relative to other K-12 Pennsylvania school districts, experience teacher shortages and increased turnover. This results in larger class sizes and reduced instructional quality (Lapp & Shaw-Amoah, 2023). As a result, students in these districts receive lower education outcomes, further increasing the achievement gap between prosperous and economically distressed districts.

Mitigating these inequalities is important to ensure that all students, irrespective of socioeconomic status, receive high-quality education and qualified instructors. The Act 1 Index, which was created by the Pennsylvania Taxpayer Relief Act of 2006, restricts the ability of school districts to increase property taxes above a level without the vote of the citizens (Welton, 2015). Though intended to serve taxpayers, this mechanism impedes underfunded districts from competing on salary, impairing their ability to hire and retain qualified educators. If this is not solved, underfunded districts, like District 84 (District 84 & Federation of District 84 Teachers, 2016), etc., will continue to suffer from staffing deficits, resulting in ongoing educational inequities and long-term ill effects on student achievement and community health. Hence, there is a pressing need to inspect and redefine the existing financing mechanisms and salary systems to ensure educational equity throughout Pennsylvania.

1.3 Purpose and Significance of the Study

This study assessed how teachers' starting salaries affect the academic performance of students in southeastern Pennsylvania. The differences in teacher compensation in this region vary greatly, between very wealthy suburban

districts and economically disadvantaged urban and rural areas. The study attempted to develop insights into the role that teacher starting salary plays in the overall educational equity in southeastern Pennsylvania by investigating how these salary differentials impacted student academic performance. The findings will inform policy decisions in Pennsylvania and help address educational disparities that present significant challenges in the region. The importance of this study lies in the fact that teacher quality is a primary determinant of student academic performance and so are the relative salaries of teachers. Teacher salaries are a key factor in attracting and retaining qualified educators to provide appropriate instruction to students (Bryant et al., 2023). In southeastern Pennsylvania, the disparities between K-12 public school districts' salaries are large, allowing wealthier districts to start teachers at higher paying salaries compared to underfunded ones. Differences in pay can affect the quality of teaching and, as a result, quality of student academic performance (Lapp & Shaw-Amoah, 2023). Due to inequities in the region, it is imperative to understand the link between teacher compensation and student academic outcomes. These disparities, if not addressed, can perpetuate a cycle of inequality in educational opportunities for students in low-income and/or underfunded districts, exacerbating existing achievement gaps.

While this study was not without its limitations, its importance lies in the contribution that it affords to professional knowledge and practical solutions for educational leaders and policymakers in southeastern Pennsylvania. This study provides evidence on whether such persistent funding problems harm student academic performance in districts where there are persistent disparities in salary. For instance, in southeastern Pennsylvania, District 92 pays teachers' salaries that far surpass the State average, while a district such as District 83 finds it difficult to recruit and retain teachers because their salaries are considerably lower (Heinze, 2017; Lapp & Shaw-Amoah, 2023). The study filled an existing gap in knowledge by examining the issue at the local, district level. This provided insight into the potential benefits of reducing the starting salary gap between such districts, demonstrating its importance in ensuring that all students, regardless of their socioeconomic status, have access to high-quality education.

Additionally, this study contributed to the growing literature on educational equity and teacher compensation. There has been a great deal of work conducted on overall teacher quality and its relationship to student academic performance, but far fewer studies have examined the local context of southeastern Pennsylvania, where funding inequities are pronounced. The findings contributed by presenting a region-specific analysis that might become a model for other regions with shared funding issues. Additionally, the study also offered a clearer picture of how the existing pay differentials in southeastern Pennsylvania influence education quality in hope of allowing leaders to champion for policy changes and reforms to the State's educational funding model.

The results of this research offer policymakers and the educational leaders in southeastern Pennsylvania some much-needed concrete data to support legislative efforts to narrow teacher pay differences in an effort to rectify educator

compensation equity. To achieve this equity, however, leaders must address the systemic structures that create these pay gaps in the first place. One of the key factors contributing to significant funding inequities, particularly affecting low-income districts, is the Act 1 Index. The Act 1 Index, enacted in 2006 with the signing of Special Session Act 1 of 2006, limits property tax increases in Pennsylvania (Welton, 2015).

The study's findings help educational administrators and school district leaders in southeastern Pennsylvania have a clearer understanding of the connection between teacher salaries, recruitment and retention. Low funding for districts, coupled with high turnover rates, often result in larger class sizes, lower teacher experience and, subsequently, lower student performance (Frahm & Cianca, 2021). With recognition of the link between teacher salaries and student academic performance, district leaders can develop more effective strategies to address these issues. This includes examining starting salaries and the criteria on which career compensation is determined. These methods may include advocating for increased funding, enhancing teacher working conditions, and expanding opportunities for professional development, ultimately strengthening a district's capacity to offer competitive salaries and retain high-caliber, seasoned educators.

This study also provided policymakers and district leaders with evidence to argue for changing the way school districts in southeastern Pennsylvania are funded. The researcher envisioned this study would help close the gap in teacher starting salaries and lead to the development of a fairer, more equitable, public educational system. In such a system, no student is deprived of the free opportunity to learn from a qualified and experienced teacher simply because they attend a poorer, underfunded K-12 public school district. The researcher hoped that if the funding gap can be closed, then poor student academic performance, which has plagued certain districts with teacher shortages and teacher turnover in the past, will be improved going forward. With that said, this study's findings are pertinent for broader educational reform in Pennsylvania. Due to the detail provided on the particular effects of teacher compensation on student academic performance in southeastern Pennsylvania, the study serves as a model for other regions and/or states with similar funding issues.

1.4 Research Questions

This study investigated the following three research questions, each designed to explore a critical dimension of student academic performance in relation to beginning teacher salaries and economic disparities in southeastern Pennsylvania school districts:

RQ1. How does the beginning (minimum) teacher salary correlate with student academic performance in southeastern Pennsylvania school districts?

RQ2. What is the relationship between teacher minimum (beginning) salary and student outcomes and what variables impact this relationship?

RQ3. How do financial constraints in economically disadvantaged districts, as defined by the Pennsylvania Adjusted Act 1 Index, affect the relationship between teacher

salaries and student academic performance within these school districts?

By examining these research questions, this study's analysis aimed to determine the intricately interconnected relationship between student academic performance and teacher starting compensation within southeastern Pennsylvania. The results provide important insight for policymakers, teachers and other stakeholders, giving them information to aid in creating policies that increase both equity and educational quality across the State.

1.5 Hypotheses

H1₀. Higher minimum teacher salaries will be positively correlated with improved student academic performance.

H1_a. There is no statistically significant positive correlation between higher minimum teacher salaries and improved student academic performance.

H2₀. The relationship between minimum (beginning) teacher salary and student performance will be influenced by factors such as the financial health of the district.

H2_a. The relationship between minimum (beginning) teacher salary and student performance will not be influenced by factors such as the financial health of the district.

H3₀. Financially constrained districts will exhibit a weaker relationship between minimum teacher salaries and student performance.

H3_a. Financially constrained districts will not exhibit a weaker relationship between minimum teacher salaries and student performance.

This study suggested that starting teacher salary had a considerable influence on student academic performance during the period being studied. Through the examination of data from 92 southeastern Pennsylvania school districts, the study provided evidence-based findings that demonstrated this linkage, which shall guide policy and contributed to the larger discussion of funding public education and teacher compensation in the state of Pennsylvania. The results highlight the need to sufficiently compensate teachers to promote a productive environment towards academic excellence, ultimately serving teachers and students alike.

2. Limitations, Delimitations, and Assumptions

In conducting this study, several limitations and delimitations were acknowledged to provide transparency regarding the research scope and potential constraints.

2.1 Limitations

Limitations refer to factors beyond the researcher's control that may influence the study's outcomes and their universality (Degtjar & Rose, 2023). One primary limitation was the cross-sectional design of the research, which examined data from a specific period. The design restricted the possibility of supposing causal associations between student academic performance and starting teacher salaries. Solem (2015) explained that cross-sectional design observes exposure and outcome at the same time, hence it is difficult to conclude one before the other. Therefore, cross-sectional data could not control for non-monetary job characteristics

and other wage opportunities, such as commuting distance from home to school, geographical issues related to the personal lives of teachers, allegiance to alma maters, etc. These non-monetary job characteristics could have influenced the opportunity cost of teaching and may have complicated the observed associations.

The second limitation was the possibility of unmeasured confounding variables. Although the research tried to hold constant several variables, there were other factors affecting student academic performance not accounted for (e.g., socioeconomic status, parent involvement, and/or district-level policy). This aligned with the findings of Miles (2019), affirming that limitations are deliberately set boundaries by the researcher; however, limitations are also weaknesses that cannot be controlled and that can affect research findings. Additionally, the focus of the study on K-12 public school districts in southeastern Pennsylvania potentially restricted the generalizability of findings to other areas and/or private schools. The results' universality was restricted due to regional education policies and socioeconomic and demographic variations specific to this region.

As is the case with most research studies, the quality and availability of data was limited due to incomplete data. This led to preprocessing to ensure completeness of the analysis. In that context, the University of Southern California (2023) reported that the study limitations are those design or methodology features that affect or shape the interpretation of the results. Additionally, ethical issues about data privacy and the application of educational records required strict confidentiality protocols, restricting data access. Ross et al. (2018) observed that, in this context, the researcher must meet ethical concerns to safeguard participant privacy and ensure data integrity. Finally, findings from the study were constrained by factors, such as policy adjustments and socioeconomic trends experienced within the study's timeframe, that were out of the researcher's control. These factors introduced variability into the study, which proved challenging to account for and, thereby, may have affected the study's conclusions.

2.2 Delimitations

Delimitations refer to limits established by the researcher to limit the scope of a study (Miles, 2019). In this research, the effect of beginning (minimum) teacher compensation on academic performance among students was explored specifically, excluding other types of payment for teachers, including bonuses or performance pay. This distinction made it possible to better understand starting salary arrangements and the direct impact on student academic results. The research was confined to southeastern Pennsylvania public school districts, excluding private schools and districts in other areas to keep the scope manageable. In this regard, Brownie et al. (2023) reported that this geographical scope allows for a detailed examination of regional educational patterns since location plays a major role in determining educational outcomes.

The study was restricted to the academic years 2016-2017, 2017-2018, and 2018-2019. This specific timeframe was selected to establish a stable baseline of performance prior to

the onset of the COVID-19 pandemic. By excluding data from the pandemic era, the study controlled for the profound external variances introduced by learning disruptions, emergency remote instruction, and the digital divide. This limitation ensured that the analysis isolated the structural relationship between teacher compensation and student outcomes without the confounding noise of a global crisis. Supporting this approach, Mell et al. (2021) affirmed that such time-based limitations are essential for preserving internal validity when external factors threaten to skew results. Besides, the research employed quantitative methods, utilizing available student academic performance data, teacher salaries and avoids qualitative methods such as interviews or questionnaires. Such a decision simplified the study design and isolated quantifiable variables, matching the aims of the research. Nardi (2018) stressed that quantitative measures are best used to identify patterns and correlations and form a stable base for statistical analysis.

In addition, the research relied on district-level information and excluded student-level information to ensure confidentiality and comply with ethical guidelines. By relying on aggregated data analysis, the study ensured that the identity of individual students could not be obtained, in accordance with ethical research procedures (M. W. Ross et al., 2018). By defining the delimitations in this way, the research delivered a concentrated analysis while acknowledging aspects that could have influenced the interpretation and generalizability of the results.

2.3 Assumptions

In carrying out this quantitative research, several supporting assumptions were recognized. Firstly, it was assumed that teacher beginning salaries are an important driver of student academic performance, supported by the previously mentioned literature indicating that increased teacher salaries have the potential to draw more highly qualified educators, thus improving student academic outcomes. Secondly, it was assumed that the student academic performance measures and salary data were valid and reliable indicators of academic performance and teacher pay, respectively.

These assumptions were important, as the results of the study were dependent on the integrity and quality of its data sources. The research also assumed that external variables affecting student performance, including socioeconomic status, parental engagement and school facilities, were controlled for or accounted for in the analysis. Although such variables were not the main concern of the study, their potential influence was recognized to contextualize the results. Finally, the researcher hypothesized that the period chosen to analyze data for this purpose, the three pre-pandemic years (2016-2017, 2017-2018, 2018-2019) leading to the COVID-19 pandemic, offered a static and representative three-year window to review the correlation of teacher pay to student performance uncorrupted by disruptions related to the pandemic.

3. Definitions of Key Terms

Academic Performance. The extent to which students have attained their educational goals, often measured through

standardized test scores, Grade Point Average (GPA), and graduation rates (York et al., 2015).

Act 1 Index. The Act 1 Index is a financial measure established under Pennsylvania's Taxpayer Relief Act (also known as Act 1 of Special Session 2006) to regulate the maximum allowable tax increases that school districts can impose without voter approval or state-approved exceptions. Calculated annually by the Pennsylvania Department of Education (PDE), the Act 1 Index reflects a district's ability to generate revenue for educational expenses while considering local economic conditions. It is particularly significant in addressing funding disparities across districts with varying wealth and economic constraints. The Act 1 Index plays a critical role in balancing the need for educational funding with the capacity of local taxpayers to support schools. By accounting for both State- and district-level economic factors, it provides a framework to address inequities among districts while maintaining accountability to taxpayers (Pennsylvania State Education Association [PSEA], 2025).

1) *Base Index.* Applies to most school districts and represents the standard tax increase limit. The base index is calculating by averaging the percent increases in the Statewide average weekly wage, and 2) the Federal employment cost index for elementary/secondary schools (PDE, n.d.). As the PSEA (2025) notes, the base index displays a rough measure of the rate of change in compensation costs.

2) *Adjusted Index.* The Adjusted Act 1 Index is the Base Index plus an adjustment for lower wealth districts (PSEA, 2025). The Adjusted Index applies to districts with lower wealth (determined by factors such as median household income and property values), allowing them to raise taxes slightly above the base limit to address their financial challenges (PDE, n.d.). The adjustment is based on a district's relative wealth, with the lowest wealth districts receiving the largest upward adjustments to the base Index (PSEA, 2025).

a) *Adjusted Act 1 Index (2018-2019).* Below are some examples of Act 1 Index applications for various school districts in southeastern Pennsylvania during the 2018-2019 Fiscal Year when the statewide Act 1 Base Index was 2.4%, as published by the PDE (n.d.). The higher this Adjusted Act 1 Index is, the poorer the school district. Wealthier school districts will only receive the Base Index for that particular year. Examples of this Adjusted Act 1 Index include:

- *District 13* (County A): Adjusted Act 1 Index: 4.0%
- *District 20* (County B): Adjusted Act 1 Index: 3.3%
- *District 36* (County C): Adjusted Act 1 Index: 3.3%
- *District 41* (County D): Adjusted Act 1 Index: 3.8%
- *District 56* (County E): Adjusted Act 1 Index: 3.7%
- *District 66* (County F): Adjusted Act 1 Index: 3.1%
- *District 77* (County G): Adjusted Act 1 Index: 2.4%

COVID-19 Pandemic. A global health crisis that began in late 2019, leading to widespread illness, death and significant disruptions to daily life, including the closure of educational institutions and schools in southeastern Pennsylvania. This pandemic caused a major shift to remote learning (Bozkurt et al., 2020).

Educational Equity. A principle ensuring that all students have access to the resources and opportunities necessary to achieve academic success, regardless of their socioeconomic background or circumstances (Shields et al., 2017).

Entry Level Salary. The starting compensation offered to employees. In the context of this study, the entry level salary refers to the initial salary provided to teachers upon entering the profession (Zamarro et al., 2024).

Locale. A general geographic indicator that classifies the type of area where a school is located. Locale codes are based on a twelve-category framework that includes four primary classifications (City, Suburban, Town, and Rural) that each have three sub-types. The National Center for Education Statistics (NCES) uses locale codes for general description, analysis, sampling, and other statistical purposes. The classifications begin with standard urban and rural criteria defined by the Census Bureau, and NCES extends these designations to provide additional detail (Gevert & Maselli, 2024). Gevert and Maselli (2024) outlined the classifications as follows:

- *City – Large.* Territory inside an urban area with population of 50,000 or more and inside a principal city with population of 250,000 or more.
- *City – Midsize.* Territory inside an urban area with population of 50,000 or more and inside a principal city with population less than 250,000 and greater than or equal to 100,000.
- *City – Small.* Territory inside an urban area with population of 50,000 or more and inside a principal city with population less than 100,000.
- *Suburban – Large.* Territory outside a principal city and inside an urban area with population of 250,000 or more.
- *Suburban – Midsize.* Territory outside a principal city and inside an urban area with population less than 250,000 and greater than or equal to 100,000.
- *Suburban – Small.* Territory outside a principal city and inside an urban area with population less than 100,000 and greater than or equal to 50,000.
- *Town – Fringe.* Territory inside an urban area with population less than 50,000 that is less than or equal to 10 miles from an urban area with population of 50,000 or more.
- *Town – Distant.* Territory inside an urban area with population less than 50,000 that is more than 10 miles and less than or equal to 35 miles from an urban area with population of 50,000 or more.
- *Town – Remote.* Territory inside an urban area with population less than 50,000 that is more than 35 miles from an urban area with population of 50,000 or more.
- *Rural – Fringe.* Territory outside an urban area that is less than or equal to 5 miles from an urban area with population of 50,000 or more, as well as territory outside an urban area that is less than or equal to 2.5 miles from an urban area with population less than 50,000.

- *Rural – Distant.* Territory outside an urban area that is more than 5 miles but less than or equal to 25 miles from an urban area with population of 50,000 or more, as well as territory outside an urban area that is more than 2.5 miles but less than or equal to 10 miles from an urban area with population less than 50,000.
- *Rural – Remote.* Territory outside an urban area that is more than 25 miles from an urban area with population of 50,000 or more and is also more than 10 miles from an urban area with population less than 50,000.

Performance Based (Merit) Pay. A compensation strategy where employees receive bonuses or salary increases based on their performance, often assessed through evaluations or achievement metrics (Boito, 2024).

Public School District. A geographically defined area within a state that operates public primary and secondary schools, funded and managed by local, state and/or federal government entities (Thompson et al., 2019).

Southeastern Pennsylvania. A region encompassing several counties in the southeastern part of the State of Pennsylvania, known for its diverse communities and educational institutions (Raitz et al., 2019). For this study, Southeastern Pennsylvania is the region encompassing the following seven counties. These seven counties included 92 school districts in this study and are located as follows: County A (18), County B (12), County C (10), County D (15), County E (8), County F (8), and County G (21). This specific area was selected for its diversity in demographics, funding levels and teacher compensation, representing a wide range of city, suburban, rural and town communities.

Standardized Test Scores. Scores derived from assessments administered and scored consistently, used to measure students' academic performance across different populations (Schneider, 2017). Standardized tests are assessments administered and scored consistently across all test takers to evaluate educational achievement and compare performance across different populations. This study focuses on the Pennsylvania System of School Assessment (PSSA) and Keystone Exams. The PSSA evaluates students in Grades 3 through 8 in mathematics and English Language Arts (ELA), while the Keystone Exams assess high school students in Algebra I and Literature. These tests are critical tools for measuring student learning, school effectiveness, and the impact of teacher compensation on academic outcomes (PDE, n.d.).

Teacher Compensation. The total financial and non-financial benefits provided to teachers, including salary, health benefits, retirement plans and other incentives (Alade & Okeke, 2021).

Teacher Retention. The ability of schools and districts to keep teachers employed over time, minimizing turnover and maintaining instructional continuity (Bryant et al., 2023).

Summary

This chapter outlined the foundational aspects of the study, including the background, context, significance and philosophical underpinnings guiding the research. It defined

key terms essential to understanding the study's focus and acknowledged the limitations and delimitations that framed the research scope. The next chapter investigated the literature review, detailing existing research on teacher compensation and student performance, followed by chapters on the methodology and design used by the researcher, the data collection and analysis procedures employed by the researcher, and the final conclusion and recommendations for further study. The findings were presented sequentially, leading to a summary discussion that interpreted the results considering existing literature and concluded with implications for policy, practice and future research.

4. Literature Review

This chapter provided a critical review of current literature regarding the connection between teacher pay and student academic performance. It integrated theoretical and empirical research to examine how teacher pay affects recruitment, retention, job satisfaction and overall educational attainment. This review of literature was organized in terms of key sections, namely theoretical frameworks, empirical evidence and research gaps. Through a critical examination of current research, this chapter identified gaps and illustrated the necessity for additional research. The literature review provided a basis for comprehending how salary structures affect educational equity and student achievement, informing the following methodology of this study.

4.1 Theoretical/Conceptual Framework

Human Capital Theory, established by economists Gary Becker (1962) and Theodore Schultz (1961) in the 1960's, suggested that people's knowledge, skills and life experiences, referred to as human capital, are prime determinants of economic productivity (S. Ross, 2024). Becker and Schultz believed that investments in training and education increase the productive capacity of a person, resulting in better economic returns for the individual as well as society (Figure 1).

Ding et al. (2021) reported that Human Capital Theory assumes that, like physical capital, human capital may be built up and accumulated with planned investments that provide returns over the long run. The theory runs on some crucial assumptions that involve people and organizations making informed investment decisions on education and training, seeking to gain maximum economic return (Tonini, 2021). Second, it reasons that a rise in human capital automatically equates to increased productivity, which can be measured and attributed to economic benefits (Eleyae, 2021). Third, the theory focuses on economic rewards as the main incentive for individuals to develop their human capital, highlighting the possibility of higher incomes and better job prospects (Bhosale, 2025).

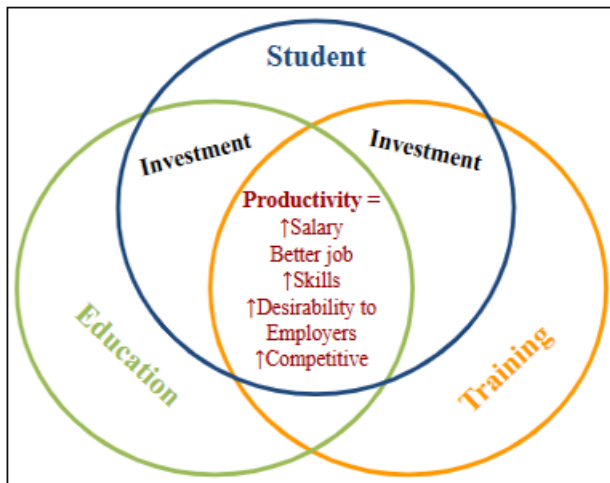


Figure 1: Human Capital Theory

Note. This figure is from *Relationship of Institutional Characteristics to CACREP Accreditation of Doctoral Counselor Education Programs*, by R. L. Pace, Jr., 2016, Doctoral dissertation, Walden University (<https://scholarworks.waldenu.edu/dissertations/2097>).

Using the Human Capital Theory in the education sector implies that increased teacher salary is an investment in teachers' human capital, encouraging the acquisition of skills and professional advancement. Attractive compensation ensures that high-caliber individuals are drawn into the teaching field and are motivated to pursue further education and training. Makokha et al. (2024) utilized the Human Capital Theory to demonstrate that equitable teacher compensation and professional development directly influence job satisfaction and commitment, ultimately leading to better student learning achievements. However, the correlation between teacher salaries and student academic performance is also in alignment with Yontz and Wilson (2021), showing that although increased salaries can stimulate student progress in high income districts, their impact in low-income districts is negligible because of larger socioeconomic issues. These research studies implied that teacher compensation (salary) alone was not guaranteed to produce greater student academic performance. Other elements like professional support, school leadership and conditions in which teachers taught also bear significant weight in determining school quality.

While Human Capital Theory provides an effective conceptualization of the role teachers' compensation plays in influencing student academic performance, this study applies it directly to examine how it boosts teachers' effectiveness, retention and student academic performance by spending on teachers' human capital in the form of competitive salaries. For instance, in southeastern Pennsylvania, beginning salaries at the District 2 increased from \$51,845 in 2019-2020 to \$54,397 for 2022-2023, indicating an upward investment in teachers' pay (Americans for Fair Treatment, 2024). Likewise, District 3 experienced a starting teacher pay rise from \$48,085 to \$51,059 over the same duration (District 3 & District 3 Education Association, 2025). These incremental growths conformed to the theory's central hypothesis that greater economic incentives can motivate professional progress and productivity. With a focus on salary as the vehicle to skill acquisition and professional development, the study examined how financial compensation affected overall academic performance while considering potential limitations such as differences in context and other factors affecting educational quality.

4.2 Domestic Empirical Findings

National Overview of Teacher Salaries and Student Performance in the United States

The relationship between teacher salaries and student academic performance has been a focal point of educational research in the U.S. Numerous large scale empirical studies have explored how variations in teacher compensation impact student outcomes, revealing complex dynamics influenced by economic, policy and regional factors (García & Han, 2022; Hanushek, 2005; National Education Association [NEA], 2024). As of the 2022-2023 academic year, the national average public school teacher salary was \$69,597, with starting salaries averaging 42,845 (NEA, 2024). These figures represented a 4.2% increase from the previous year, indicating a positive trend in teacher compensation. However, Figure 2 shows teacher salary growth over the last 18 years and demonstrates that teachers' salaries, once adjusted for inflation, are less today than 10 years ago. It highlights that, the real purchasing power of teachers' salaries is lower now than it was a decade ago, which could impact their financial well-being and the attractiveness of the teaching profession.

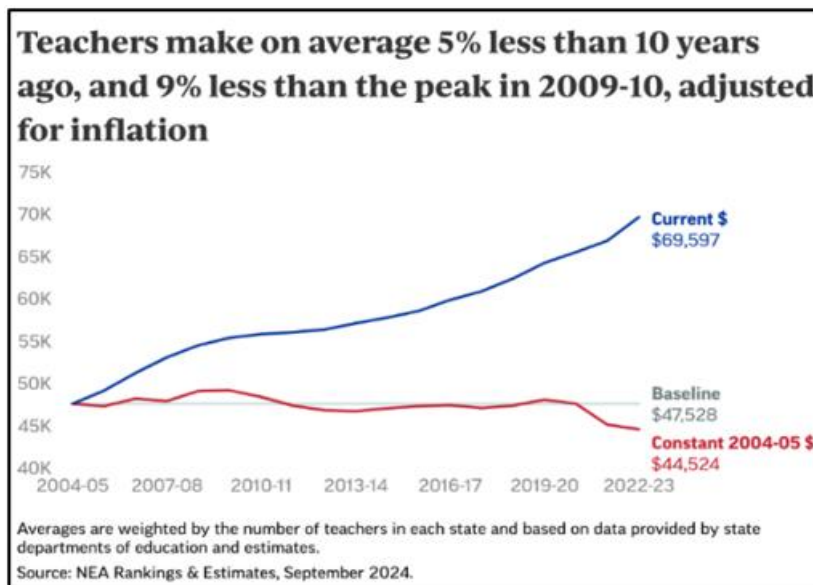


Figure 2: Overall Teacher Salary Trend in the U.S.

Note. From *Teacher Pay & Per Student Spending*, by National Education Association, 2024 (<https://www.nea.org/resource-library/educator-pay-and-student-spending-how-does-your-state-rank/teacher>). Copyright 2024 by the National Education Association.

Statistics presented by the NEA (2024) emphasized that the disparities persist amongst states, not just within the State (Pennsylvania) in which this study occurs. For instance, California reported an average salary of \$95,160, while West Virginia's average stands at \$52,870. Such variations underscored the influence of state level policies and economic conditions on teacher pay.

Existing research having examined the correlation between teacher salaries and student academic achievement has provided mixed results (García & Han, 2022; Hanushek, 2005). García and Han (2022) indicated that the use of nationwide representative district level data revealed a strong positive correlation between increased teacher base salaries and better student performance in mathematics and English, two of the subject areas being researched in this southeastern Pennsylvania study. Hanushek (2005), on the other hand, implied that simply raising salaries without reforms such as teacher quality and resource allocation cannot provide significant gains in student outcomes.

Reform initiative related to federal education policy can have a significant influence on teacher compensation structures. Aranda-Comer (2023) stated that policies intended to standardize teacher compensation, such as the Pay Teachers Act, aim to set a minimum base pay of \$60,000 per year for public school teachers nationwide. In the U.S., teacher compensation debates pressuring the raising of teacher salaries are linked to federal, state and subsequent funding source debates. Allegretto (2025) contended that increasing teacher salary, notably closing the “teacher pay penalty” for those entering the workforce post-college, would help alleviate teacher shortages and boost student achievement. In the face of wages that fall short of other professionals with college degrees, Allegretto (2025) emphasized that targeted and sustained investments to improve teacher compensation and close “the pay gap between public teachers and similarly educated professionals is essential to attracting and retaining qualified educators, boosting student achievement, and

securing the future of public education” (“Why it matters” section)

Wright (2025), however, raised concerns regarding the cost to state budgets and the possibility of encroaching on state control of education policies. For example, Wright contended that in Texas, education proponents oppose the utilization of public money for private schooling, highlighting the significance of fully funding public education and the prospect of financial burden for state funds.

Within the U.S., in the study state of Pennsylvania, an analysis of starting teacher salaries in various counties reveals significant regional disparities (Americans for Fair Treatment, 2024; NEA, 2024). For example, in County A, Pennsylvania, starting salaries amongst districts ranged from \$40,000 in District 13 to \$50,001 in the District 10 during the 2016-2017 period (District 10 & District 10 Teachers’ Association, 2012; District 13 & District 13 Education Association, 2016). These differences highlighted the impact of local economic conditions and district-level decisions on teacher compensation. While higher salaries have the potential to attract and retain qualified educators, establishing a direct causal link between increased teacher pay and student academic performance remains challenging to establish. Hendricks’ (2013) study indicated that while there is a potential relationship between teacher pay and student academic achievement, current studies have failed to establish a strong connection.

In addition, factors such as teaching conditions, professional development opportunities and socioeconomic contexts also significantly influence educational outcomes. Aikens and Barbarin (2008) showed that district conditions contribute more to socioeconomic differences in learning rates than family characteristics do (as cited in Broer et al., 2019). Therefore, comprehensive strategies that address multiple facets of the U.S. public academic educational ecosystem are

essential for meaningful improvements. Hence, the discussion showed that the interplay between teacher salaries and student academic performance is dynamic, influenced by a combination of economic, policy, and regional factors. While competitive compensation is a critical component in attracting and retaining quality educators, it should be part of a broader strategy that includes professional development, resource allocation and supportive teaching environments to effectively enhance student academic outcomes (Han, 2021).

Teacher Recruitment, Retention and Pay Incentives in U.S. Public School Districts

The ongoing challenge of recruiting and retaining educators in U.S. K-12 public schools highlights the critical role that starting salaries play in establishing a stable teaching force. Carver-Thomas and Darling-Hammond (2019) demonstrated that resolving teacher turnover, fueled in part by low salaries, is essential to minimizing shortages and enhancing school district effectiveness because high turnover has negative effects on student learning and district budgets. Murray (2024) also reported that increased teacher salaries are associated with higher retention. For example, they reported that increases in salaries substantially lowered teacher turnover by 3 to 5 percentage points in the initial year following enactment, with the strongest effects among teachers with eight or more years of experience. Along with salaries, other conditions such as teaching environment, professional learning opportunities and socioeconomic environments have substantial impacts on student educational outcomes.

Evidence suggests that teacher related factors like teaching conditions, professional development and socioeconomic contexts have a great impact on educational outcomes. For example, Burroughs et al. (2019) emphasized that teacher related factors like experience, professional knowledge and the establishment of professional development opportunities are linked with greater student achievement. Moreover, Usop et al. (2024) demonstrated that teachers' socioeconomic status indicated that teachers with fewer sources of income might be more resourceful in teaching, and this could lead to increased educational effectiveness. These results highlighted the need for holistic strategies that address multiple aspects of the educational environment to bring about significant improvements. Examining initial salary data across different districts gave insight into how compensation affects recruitment and retention.

For example, in County A, Pennsylvania, District 3 started with a salary of \$46,058 in the 2016-2017 school year. By the 2023-2024 school year, this salary had increased by \$5,001 to \$51,059, reflecting a growth of 10.86% over the eight-year period (District 3 & District 3 Education Association, 2025). During the same period, the District 8, a district within the same county, starting salaries experienced an increase of \$8,330, rising from \$42,523 to \$50,853, representing a 16.38% growth (District 8 & District 8 Education Association, 2014, 2022). These small, incremental increases might go towards enhanced teacher retention and the recruitment of new teachers to these districts. Nonetheless, making a direct causal connection between teacher compensation and student academic performance is still difficult. Although higher salaries can

potentially attract and retain good teachers, existing research has yielded mixed findings on their effects on students. For example, Ordway (2020) reported that increasing teachers' salaries enhances student academic performance through increased rates of retention and proposed that implementing a flat salary scale can be a good method to boost performance. This proposed approach is a sharp contrast from Pennsylvania's current salary structure in K-12 public education, which bases compensation on a teacher's experience and educational qualifications.

On the other hand, Hendricks (2013) identified no significant relationship between teacher salaries and student academic performance, pointing to the role of variables like teaching environment, professional growth opportunities and socioeconomic settings. Thus, holistic approaches addressing various dimensions of the educational environment are necessary for effective change. Accordingly, this leads us to conclude that, although competitive starting salaries are an important part of finding solutions to teacher recruitment and retention in U.S. public school districts, they must be part of a multifaceted strategy that includes better working conditions, opportunities for professional development and alleviating socioeconomic factors to further overall educational quality and student performance.

Socioeconomic and Demographic Influences on Salary Performance Relationships

The connection between teacher salary and student academic performance is affected by a range of socioeconomic and demographic variables like district affluence, racial demographics and locale classifications. These factors can strongly influence the effects of salary changes on educational performance, highlighting the difficulty of isolating salary as a single variable. Wealthy districts tend to have the economic means to provide higher teacher pay, which can recruit and retain more experienced teachers. To add, these wealthier school districts also have the resources to provide more professional development and better school resources to help students, making it harder to isolate the impact of increasing starting salaries on student academic performance alone. Yontz and Wilson (2021) reported that in Ohio, a state bordering Pennsylvania to the west, more money for teachers is associated with improved student performance, especially in affluent districts. Yontz and Wilson further demonstrated that in lower income districts, the relationship between higher salaries and student academic performance was not statistically significant, indicating that more resources and support structures must be available to produce better educational results in these districts.

The Annie E. Casey Foundation (2024), an organization devoted to developing a brighter future for millions of children and young people with respect to their educational, economic, social and health outcomes, states that the makeup of a district can also influence the effectiveness of salary increases on student academic performance. Also, Han and Maloney (2022) found that teacher unionization, which often advocates for better pay, had a positive impact on student achievement predominantly in middle class districts. This effect was less pronounced in low and high socioeconomic

districts, highlighting the interplay between socioeconomic status, racial composition and educational outcomes. Districts of various locale classifications each face their own distinct challenges that can affect the relationship between teacher salaries and student academic performance. Suburban districts may offer higher salaries due to a larger tax base but also contend with higher living costs and potentially more challenging teaching environments. For instance, research indicates that urban areas generally feature higher costs of living driven by economic inequality (Campbell, 2021). Consequently, these elevated living expenses necessitate increased salaries to attract comparable teachers. Rural districts, with limited financial resources, may struggle to match these higher salaries, impacting their ability to attract qualified educators.

A report from the Rural School and Community Trust highlighted that rural teachers earn less than their non-rural counterparts, with average annual salaries of \$69,797 in rural areas, compared to \$74,153 in suburban districts and \$73,357 in urban districts (Leins, 2019). An examination of starting teacher salaries across various Pennsylvania school districts from 2016-2017 revealed significant disparities. Table 1, with data extracted from Americans for Fair Treatment (2024) and district CBA's, illustrates the variability in teacher compensation, often reflecting the economic capabilities of each district.

Wealthier districts like District 44 and District 57 offer higher starting salaries compared to districts like District 13, which may influence their ability to attract and retain quality educators. As demonstrated in Table 1, marked disparities exist within the counties across the southeastern Pennsylvania region.

Table 1: Various Teacher Salaries Across Pennsylvania

County	District	2016-2017 Starting Salary	
County A	District 13	40,000	
County A	District 10	50,001	
County Variance (\$ %)		\$10,001	25.00%
County B	District 28	40,777	
County B	District 19	50,952	
County Variance (\$ %)		\$10,175	24.95%
County C	District 32	43,133	
County C	District 38	50,250	
County Variance (\$ %)		\$9,685	16.50%
County D	District 41	41,607	
County D	District 44	51,820	
County Variance (\$ %)		\$10,213	24.55%
County E	District 60	43,999	
County E	District 57	51,927	
County Variance (\$ %)		\$7,928	18.01%
County F	District 64	44,540	
County F	District 67	51,604	
County Variance (\$ %)		\$7,064	15.86%
County G	District 83	42,710	
County G	District 92	54,805	
County Variance (\$ %)		\$12,095	28.32%

Note. Data compiled from the 2016-2017 collective bargaining agreements of the respective school districts (District 10 & District 10 Teachers' Association, 2012; District 13 & District 13 Education Association, 2016; District 19 & District 19 Education Association, 2017;

District 28 & District 28 Education Association, 2018; District 32 & District 32 Teachers' Association, 2018; District 38 & District 38 Education Association, 2017; District 41 & District 41 Education Association, 2013; District 44 & District 44 Education Association, 2017; District 57 & District 57 Education Association, 2017; District 60 & District 60 Education Association, 2015; District 64 & District 64 Education Association, 2017; District 67 & District 67 Education Association, 2015; District 83 & District 83 Education Association, 2015; District 92 & District 92 Education Alliance, 2016).

Beyond salaries, factors such as working conditions, professional development opportunities and community support play crucial roles in teacher effectiveness and student success. Butterworth (2023) reported that the teacher pay gap has widened over time, with teachers earning significantly less than their non-teaching counterparts, which may deter talented individuals from entering or remaining in the profession. While raising teacher salaries supports educational reform, its impact on student outcomes depends on broader socioeconomic, racial and geographic factors requiring comprehensive policy solutions.

Regional Comparisons of Teacher Compensation and Student Achievement

The connection between teacher salary and student academic performance differs significantly across regions in the U.S. because of differences in economic environments, state education policies and demographic traits (Americans for Fair Treatment, 2024; Han & Maloney, 2022; Yontz & Wilson, 2021). Although greater teacher pay is generally linked with better recruitment and retention, the effect on student academic performance is strongly influenced by local socioeconomic conditions, cost of living and school financing systems. Affluent districts are generally more likely to show high correlations between rising teacher pay and student performance. For instance, Yontz and Wilson (2021) discovered that in wealthy Ohio school districts, increased compensation dramatically improved student performance, while low-income districts did not experience the same without corresponding investments in education infrastructure. Likewise, Han and Maloney (2022) observed that teacher unionization and collective bargaining raised middle class school districts' achievement scores but had a limited impact in both high poverty and high wealth districts, supporting the idea that pay in isolation does not yield similar results.

In Pennsylvania, pay disparities in teachers' salaries between counties further illustrates the same phenomenon. For example, District 11 in County A registered a consistent rise in salary from \$40,873 in 2016-2017 to \$44,982 by 2022-2023, indicating modest growth proportionate with the district budgets (Americans for Fair Treatment, 2024; District 11 & District 11 Education Association, 2016). Conversely, District 10 pays the highest starting salary of \$50,001 in 2016-2017, rising incrementally to \$53,507, which potentially facilitates more productive teacher retention and student performance (Americans for Fair Treatment, 2024; District 10 & District 10 Teachers' Association, 2012). These rates reflected larger trends recognized by Hendricks (2013), who underlined that,

although competitive salaries can assist with decreasing teacher turnover, they must be paired with support systems in order to significantly impact learning.

Suburban school districts in Counties B and G have a higher starting pay, on average. District 92, for instance, paid \$54,805 in 2016-2017, increasing to \$57,003 by 2023-2024 (Americans for Fair Treatment, 2024; District 92 & District 92 Education Alliance, 2016). This trend aligns with broader economic realities. Because higher concentrations of wealth generally drive-up local living expenses (Campbell, 2021), suburban districts in such areas must often provide greater compensation to offset the financial pressures and balance demanding working conditions. Still, even with these pay raises, regional factors such as student diversity, underfunding and class sizes could continue to restrict student academic performance. On the flip side, District 13, a city and less well-off district in County A, had a starting salary of only \$40,000 in 2016-2017, increasing to 47,475 by 2023-2024 (Americans for Fair Treatment, 2024; District 13 & District 13 Education Association, 2016). A city district like District 13, paying \$14,805 and \$9,528 less than suburban District 92, is likely hindered in its efforts to recruit and retain qualified teachers compared to surrounding districts. Butterworth (2023) also contended that the increasing difference in pay between teachers and other salaried professionals discourages highly qualified individuals from entering the teaching profession, especially into disadvantaged communities.

Additionally, policies at the Federal and state levels, within the U.S., also determines the way salary affects educational performance. The Pay Teachers Act, introduced in the Senate by Senator Bernie Sanders on March 9, 2023, for example, suggests a \$60,000 minimum salary across the U.S., but opponents such as Wright (2025) argue that mandating such a requirement across different economic states may be costly to state budgets and diminish local autonomy. The effects of such policies are extremely diverse across states and particularly relative to the cost of living and current educational facilities. Regional variations in teacher pay structures, influenced by economic well-being, demographic makeup and state policies, significantly influence the compensation-academic performance relationship. Successful reform must take these contextual differences into account. As seen in wealthier areas, as measured by the Act 1 Index (PDE, n.d.), such as District 22 (2014, 2018), District 92 (2016), and District 10 (2012), pay raises can enhance teacher retention and, in certain instances, student academic performance. This is especially true when implemented as part of broader strategies that address systemic issues like class size, professional development and support services (Burroughs et al., 2019; Richmond, 2025).

Although previous studies have examined the association between teacher pay and student academic performance in different U.S. regions, there remains a significant gap in knowledge about how certain policy interventions, including performance-based bonuses and/or targeted raises, affect learning outcomes in low funded districts. Future research must examine the effectiveness of these measures in different socioeconomic settings to inform more equitable and effective pay reform.

The Pennsylvania Context: Trends in Teacher Starting Salaries and Academic Performance

Neves (2025) writes that school employee [teacher] pay significantly affects the ability to attract excellent educators and keep them on the job as well as student academic results. While the U.S. shows clear correlations between teaching salary distributions in regions marked by significant differences in pay levels due to economic diversity and varying levels of district financial standing (Lapp & Shaw-Amoah, 2023), the educational results in Pennsylvania become very uneven because teachers earn different salaries between districts throughout the State. The State has taken steps to address these gaps, yet southeastern Pennsylvania appears to face challenges, as pay variations may, or may not, align with student academic performance levels. The discussion about teacher compensation remains active across the U.S. as studies repeatedly confirm that excellent teaching professionals need competitive pay to stay committed to their profession. NEA (2024) showed that United States teachers earned \$69,597 per year on average, including \$42,845 starting pay. The payment levels for teachers differ substantially among different states and districts, thereby influencing both the teaching performance and educational outcomes of their students. García and Han (2022) state that academic performance of students improves in districts that offer elevated compensation for teachers because these districts can attract and retain educators as they advance their qualifications. Areas that pay teachers less money experience increased teacher departures alongside teacher vacancies, which cause student learning to suffer (Carver-Thomas & Darling-Hammond, 2019).

The issue of starting teacher salaries in Pennsylvania shows complex patterns because various districts in the State set different beginning levels of salary compensation. Educational equity in southeastern Pennsylvania becomes clear through examples that demonstrate how regional teacher salary differences create varied educational conditions. School districts within this area operate on different financial levels as wealthier districts pay their teachers better than the disadvantaged school districts. The data from the southeastern Pennsylvania School District Listing revealed starting salaries for District 92 in County G for the 2018-2019 academic year reached \$56,128 yet the District 13 in County A began with \$41,000 during the 2018-2019 academic year (District 13 & District 13 Education Association, 2016; District 92 & District 92 Education Alliance, 2016). This disparity is a strong theme that is repeated throughout the region being studied

School districts with lower income neighborhoods often struggle to maintain stable teacher pay. These challenges, such as salary gaps, frequent staff turnover and difficulty attracting and retaining qualified educators, are made worse by the pressure to compete with the higher salaries offered by wealthier districts. As a result, these districts experience more teacher departures and unfilled teaching positions. The researcher aimed to show how teachers' compensation rates in southeastern Pennsylvania influenced student academic performance. Research by Lapp and Shaw-Amoah (2023) showed that Pennsylvania ranks among the states with the worst public school system inequality due to funding and educational resource and performance gaps. The academic

performance of students in District 92 shows improvement due to both a steady teaching staff and higher district funding that stems from their higher starting salaries for teachers. The educational outcomes in District 13's public schools decline since teachers receive lower pay, the working conditions are poorer, and thus, District 13 encounters both teaching shortages and higher employee [teacher] departures.

Previous research conducted indicated that better teacher compensation alone cannot solve educational differences, but these higher wages remain essential for developing diverse teaching strategies to enhance student academic performance (Hanushek, 2005). Researchers like García and Han (2022) demonstrated how salary raises require elements such as staff professional development, smaller class numbers and better facilities to produce meaningful results. District 2 in southeastern Pennsylvania currently pays teachers \$54,397 as their starting salary in the 2022-2023 academic year and has proven through increased compensation to maintain excellent educators who deliver better educational results to students (Americans for Fair Treatment, 2024).

Teacher Compensation Policy and Educational Equity in Pennsylvania

Educational equity in Pennsylvania requires comprehensive teacher compensation policies because such policies directly impact the unequal educational experiences that exist between different school districts. The salaries of teachers serve both as an essential factor in the recruitment and retention of good teachers and as a direct determinant for wider scholastic results (Shuo, 2021; Woolcock, 2024). Research by Das (2024) suggests that competitive teacher compensation may be associated with improved student academic outcomes; however, variations in academic performance are also influenced by district-level economic factors and differing approaches to school district funding.

Teacher compensation emerges as a primary subject for studying educational equity within the U.S. educational system. The NEA (2024) reported that teacher salaries reached an average of \$69,597 for 2022-2023. Pennsylvania shows the clearest differences in teacher salaries because local funding approaches like property tax use determine educator pay rates in the State. The pay differences between better funded districts and poorer districts create an educational bias since wealthier districts can pay teachers better salaries, yet poor districts lack the funding to match these levels (Allegheny Institute for Public Policy, 2017).

Teacher salaries in wealthy (Rich) districts of Pennsylvania exceed those of teachers in economically disadvantaged (Poor) educational areas by a significant margin. The southeastern Pennsylvania area, consisting of rural, suburban, town, and city School Districts locale codes in accordance with the NCEs's Common Core of Data (CCD) Public Elementary/Secondary School Locale Code File and the Local Education Agency (School District) Locale Code File, demonstrates these unequal compensation traits between districts. According to the data set's wealth classification analysis, the average starting teacher salary across wealthy (Rich) districts for the 2018-2019 academic year was \$48,665, compared to an average of just \$47,070 in

economically disadvantaged (Poor) districts. These disparities become even more pronounced when examining district-level extremes: the starting pay for 2018-2019 at the relatively wealthy (Rich) District 92 in County G totaled \$56,128, whereas the less prosperous (Poor) District 13 in County A paid only \$41,000 (District 13 & District 13 Education Association, 2016; District 92 & District 92 Education Alliance, 2016). The installation of better compensation packages in richer school districts, within a daily commuting distance, persuades teachers to work in those districts instead of others, thereby justifying their ongoing disputes about salary inequalities. District 13 struggles to keep teachers because of its insufficient pay rates, thus leading to growing teacher turnover, which impacts student achievement negatively (Lapp & Shaw-Amoah, 2023).

The research community demonstrates an established link between what teachers earn and student academic performance. Research by García and Han (2022) established that additional teacher pay resulted in superior student achievements primarily within well-funded districts because these districts could provide better learning environment resources, including smaller class sizes and enhanced professional development opportunities. According to García and Han, higher pay benefits were less noticeable in economically disadvantaged districts without simultaneous funding for educational resources and teacher support. The research of Hanushek (2005) supported this finding because the research demonstrated that teacher compensation serves as a crucial factor but, alone, cannot solve the multi-dimensional issues affecting underfunded educational districts. Better student outcomes are unlikely to emerge from salary increases unless schools also obtain improved working environments and enhanced resources.

Various initiatives (e.g., minimum salary increases, student teacher stipends programs) aim to address compensation problems in teacher fields throughout Pennsylvania. The Pennsylvania General Assembly has launched multiple bills for raising teacher salary scales as well as handling the teacher shortage State-wide (House Bill 300, 2023; Senate Bill 300, 2023). At the Federal level, a proposed teacher salary enhancement to \$60,000 by 2027-2028 targets closing revenue gaps between districts to maintain instructor retention, according to Aranda-Comer (2023). The adaptation would benefit future teacher recruitment along with retention rates, but the policy requires equal financial support for districts to guarantee each student gets excellent educational opportunities independently of their social class status.

4.4 Literature Gaps

While extensive Federal and state level studies have attempted to clarify the link between students' academic performance and teacher pay, there is substantial knowledge deficiency related to comprehending this dynamic on a regional specific micro-region such as southeastern Pennsylvania (Carver-Thomas & Darling-Hammond, 2019; Han & Maloney, 2022; Richmond, 2025). Existing literature generalizes via larger geographic levels while ignoring varying regional differences that are potentially useful for

developing more personalized and efficient policy interventions. While research from the likes of Yontz and Wilson (2021) and Han and Maloney (2022) highlighted the complex interaction between teacher compensation and student academic success when controlled for socioeconomic and demographic factors, it tends to be missing pinpoint, district-specific analysis within regional settings. Southeastern Pennsylvania, with its diverse composition of city, suburban, town and rural school districts, was a particularly compelling setting for analyzing the impact of differences in starting salaries of teachers on student academic performance.

Existing research indicated that teacher salaries are a vital driver of recruitment and retention, particularly in high needs districts or those experiencing shortages and/or turnover (Carver-Thomas & Darling-Hammond, 2019; Murray, 2024). However, these studies often evaluated overall salary effects without isolating the specific influence of starting salaries, which are critical in shaping new teacher decisions about where to work and remain employed. Considering that entry level pay can significantly affect the ability of school districts to attract promising educators early in their careers, a deeper investigation into how starting salaries affect student academic performance was warranted. In addition, southeastern Pennsylvania encompasses seven economically mixed counties where considerable differences in beginning teacher salaries have been reported (Americans for Fair Treatment, 2024). For example, whereas District 77, County G, provided a starting salary of \$55,131 in 2018-2019, District 1's starting compensation was significantly lower at \$41,200 (District 1 & District 1 Education Association, 2016; District 77 & District 77 Education Association, 2017).

Despite these disparities, there was limited empirical evidence examining whether such salary differences were associated with differences in student academic achievement outcomes. Prior research indicated that competitive compensation systems have the potential to enhance retention and, perhaps, student achievement, but this was still questionable and failed to address the regional perspective necessary to shape more equitable funding streams (Hanushek, 2005; Lapp & Shaw-Amoah, 2023). Moreover, no thorough analysis explored how beginning salary differentials intersect with other educational factors in southeastern Pennsylvania, including class size, availability of resources, teacher demographics and community socioeconomic status. Broer et al.'s (2019) and Butterworth's (2023) research suggested that more general school district conditions and economic contexts mediated the salary performance relationship, but this multifaceted understanding was not present in region specific research. Consequently, policy advice rarely considered the complicated interaction of influences impacting educational outcomes at the district level.

Considering the gaps that already exist, there was an urgent need for targeted, empirical research examining the impact of teachers' initial salaries on student academic performance, particularly in southeastern Pennsylvania. Such research would not only enrich the wider academic debate but also provide localized information for school leaders, policymakers and education stakeholders. This localized

insight could facilitate the development of equitable starting salary structures that mitigate the disproportionate reliance on local wealth and property taxation, ensuring that baseline compensation is fair and tailored to the region's specific demographic, economic, and educational circumstances. Without this regional context, initiatives aimed at enhancing teacher recruitment, retention, and, ultimately, student academic performance may continue to fall short of tackling the underlying systemic inequities.

4.5 Conceptual Framework

The conceptual framework of this research examined the connection between teachers' initial salary and the academic performance of students in southeastern Pennsylvania. The dependent variable, student academic performance, was measured by standardized test scores and graduation rates. The independent variables were teacher salaries that influence recruitment and retention. Starting salary levels represented the initial level of compensation given to entry-level teachers in southeastern Pennsylvania, impacting whether they choose to be employed at a particular district. Salary competitiveness was, and remains, a key factor, as PSEA (2023) demonstrated how starting salaries in Pennsylvania stood against bordering states like New York, New Jersey, Delaware, and Maryland. Like many states, those bordering Pennsylvania are advancing average starting salaries of around \$60,000. Such a comparison influences the ability of the State to attract and retain effective teachers. Salary advancement opportunities also play their role, as future increments, bonuses and position advancements help foster teacher retention and career dedication.

Fuller (2024) suggested that competitive initial wages make turnover decreases possible, enabling stability in teaching staff, which reflects on improved student academic performance. While salary by itself does not determine academic performance, it significantly impacts teacher quality and stability, determining Pennsylvania school student academic achievement. This theoretical framework in this study explored the connection between teacher pay and student academic performance in Pennsylvania (see Figure 3).

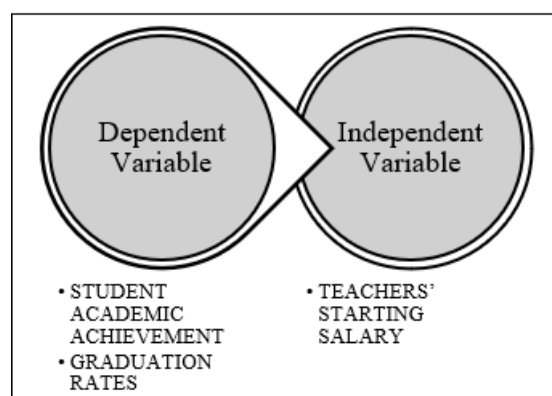


Figure 3: Conceptual Framework

The dependent variable was student academic performance, as determined by standardized test results and graduation rates. Competitive salaries influenced the recruitment and retention of skilled teachers, achieving continuity and

experience among instructional staff, and had a positive effect on student academic performance. Abubakar (2024) and Johnston (2024) indicated how salary arrangements affect teacher incentives and long-term commitment. By examining these variables, this research sought to establish whether a rise in starting teacher salaries can maximize student academic performance. Knowledge of these dynamics from this study are available in helping policymakers create salary strategies that promote teacher retention as well as student academic performance so that there can be a high-quality education system.

4.6 Summary

In this chapter, the link between teacher salary and student academic performance was investigated with a view to regional disparities in the U.S., notably in Pennsylvania. Although Federal studies established a connection between increased payment and enhanced recruitment and retention, regional studies established that socioeconomic factors and policy contexts mediate these impacts. Most importantly, there are gaps in district level studies, particularly regarding the effect of starting salaries on student academic performance in southeastern Pennsylvania. Current literature tends to generalize outcomes without considering local dynamics. This study aimed to fill these gaps by conducting a targeted and regional-level analysis. The next chapter detailed the research methodology used to analyze these connections and offered practical recommendations to reform education policy.

5. Methodology

This chapter outlines the methodology employed to study the association between starting teacher salaries and student academic performance, measured via test scores and graduation rates, in 92 southeastern Pennsylvania school districts. Analyzing the salary structures and funding mechanisms in southeastern Pennsylvania offered valuable insights that could inform equitable education policy across all school districts in the state. Hence, a significant effect of compensation on educational outcomes was a matter of how teacher salaries affected student performance on standardized tests, such as the PSSA and Keystone exams, and graduation rates. The primary objective of this study was to determine how teacher salaries affect academic performance quality, offering input on designing better educational policy.

The research questions guiding this study were:

RQ1. How does the beginning (minimum) teacher salary correlate with student academic performance in southeastern Pennsylvania school districts?

RQ2. What is the relationship between teacher minimum (beginning) salary and student outcomes and what variables impact this relationship?

RQ3. How do financial constraints in economically disadvantaged districts, as defined by the Pennsylvania Adjusted Act 1 Index, affect the relationship between teacher salaries and student academic performance within these school districts?

The hypotheses tested included:

H1₀. Higher minimum teacher salaries will be positively correlated with improved student academic performance.

H1_a. Higher minimum teacher salaries will not be positively correlated with improved student academic performance.

H2₀. The relationship between minimum (beginning) teacher salary and student performance will be influenced by factors such as the financial health of the district.

H2_a. The relationship between minimum (beginning) teacher salary and student performance will not be influenced by factors such as the financial health of the district.

H3₀. Financially constrained districts will exhibit a weaker relationship between minimum teacher salaries and student performance.

H3_a. Financially constrained districts will not exhibit a weaker relationship between minimum teacher salaries and student performance.

The research methodology and design adopted a quantitative approach, utilizing secondary data analysis to explore the relationship between teacher salaries and student academic achievement. Statistical tools, R software, were used to analyze the data and address the research questions.

Research Methodology and Design

Quantitative research methodology was used for this study, with secondary data analysis to examine the starting teacher salary and student academic performance within 92 school districts of southeastern Pennsylvania. The study aimed to determine how variations in starting teacher compensation (in particular, starting salary) and district economy variables (Adjusted Act 1 Index) affected student academic achievement as measured using PSSA and Keystone standardized test scores and graduation rates. The rationale behind using a quantitative approach was due to the researcher's aim to determine the extent to which a teacher's starting salary affects student academic performance. When it comes to studying relationships between numerical variables, quantitative research methods are excellent ways to elect as tests of associations and patterns and generalization of results can be done.

According to Fryer et al. (2018), a quantitative methodological position allows researchers to collect large quantities of data and perform statistical analyses. This approach results in measurable and replicable outcomes. Such characteristics made it an ideal method for investigating how teacher starting salary affected student academic performance. A correlational design was used for this study, testing the relationship between teacher starting salary and student academic performance without manipulation or control of variables. Quantitative design enabled the researcher to identify and quantify how the variables related to one another. The design was non-experimental, meaning that no direct intervention was used on the subjects of the study. The study looked at naturally occurring data across different districts over time. All of the key metrics were quantitative in nature: the Act 1 Index and the Adjusted Act 1 Index used to classify the school districts by wealth; the identification of the locale of the school districts; the Collective Bargaining Agreements of the 92 school districts; the starting salaries for each school district; the PSSA test results for mathematics and English; graduation rates for

each school district. The researcher did not manipulate or change any of the data used.

The methodology involved secondary data analysis as a key component. In this study's case, the study analyzed publicly available teacher salary and student academic assessment scores and graduation rate data. Secondary data has the advantage of being cheaper, quicker, and it has access to large databases that would be difficult and expensive for the researcher to gather themselves. Furthermore, researchers can use secondary data to analyze past data, making it possible for them to identify long-term trends and patterns. Sherif (2018) stated that secondary data analysis is common in educational research as it allows for the study of records and data which are already validated and publicly available. The objective of this study was to determine whether student academic performance was related to the starting salary of a teacher. The study looked at how the relationship of starting teacher salaries across 92 school districts in southeastern Pennsylvania affected the results of standardized tests and graduation rates.

This study also examined the role that district-level locale classifications and socioeconomic factors, reflected via the Adjusted Act 1 Index data set, influenced both the availability of financial resources and the capacity of districts to generate revenues to devote to teacher salaries. The use of the secondary data set allowed the study to have a robust, large-scale sample that helped gain insights about types of districts with varying economic demographics. This research design was particularly suitable to address the study's problem and to achieve its research objectives. Using a quantitative methodology, measurement of variables and their relationship on a large and diverse set of districts was possible. Correlational design allowed the researcher to investigate if a relationship existed between teacher salary and student academic performance, controlling external factors like district wealth, locale and economic conditions. Coe et al. (2017) pointed out that, in educational research where the aim is to observe existing patterns, relations, and circumstances in naturally occurring data, such designs are most effective.

Research Setting/Context

This study researched 92 school districts that were all geographically located within seven adjacent counties, referred to as the southeastern region of Pennsylvania, in this study. This region was primarily chosen due to its demographic diversity, as it included both city, suburban, rural and town school districts, and served as a reflection of diverse geographic and economic conditions, district sizes and student populations. This geographic area contained both affluent and economically disadvantaged districts, which

provided an opportunity to study the link between teacher salaries and student academic performance. These 92 school districts had been classified by the researcher as either wealthy or economically disadvantaged by using the Base Act 1 Index to identify wealthy districts and the Adjusted Act 1 Index to identify districts requiring fiscal relief. Specifically, districts assigned the unadjusted Base Index were classified as wealthy, while any district assigned an Adjusted Index greater than the Base was classified as economically disadvantaged. This classification allowed the study to generalize the data and draw conclusions about each grouping (Wealthy; Economically Disadvantaged).

To analyze the impact of financial health on student outcomes, the 92 school districts in this study were stratified into socioeconomic categories based on their Act 1 Index designation. Pennsylvania uses the Market Value/Personal Income (MV/PI) Aid Ratio to determine district wealth (PDE, n.d.). A district with an MV/PI Aid Ratio of 0.4000 or lower is considered relatively wealthy and is assigned the Base Act 1 Index, which limits tax increases strictly to the statewide inflation rate (PDE, n.d.). Conversely, districts with an Aid Ratio greater than 0.4000 are considered financially constrained ("economically disadvantaged") and are assigned an Adjusted Act 1 Index, which permits higher tax increases to generate the necessary revenue (PDE, n.d.).

For the purpose of this study, the districts were classified into two tiers of financial health based on the magnitude of their 2018-2019 Act 1 Index relative to the Base Index of 2.4%. This binary classification distinguishes between districts with high local wealth and those requiring state-mandated tax relief flexibility:

a) **Wealthy Districts (Base Index Only):** These districts were assigned the unadjusted Base Act 1 Index (2.4% for 2018-2019). According to the PDE, districts receive the Base Index when their Market Value/Personal Income (MV/PI) Aid Ratio is 0.4000 or less. This indicates high property wealth and personal income relative to the student population.

b) **Economically Disadvantaged Districts (Adjusted Index):** These districts were assigned an Adjusted Act 1 Index greater than the Base (e.g., > 2.4%). An adjusted index is granted to districts with an Aid Ratio greater than 0.4000, signifying lower relative wealth. The adjustment allows these districts to raise taxes slightly above the base limit to address financial challenges that cannot be met through their local tax base alone.

By splitting the sample into these two distinct groups, the study isolated the impact of financial constraints on student academic performance.

Table 2: Classification of District Wealth by Act 1 Index (2018-2019)

Classification	Act 1 Index Criteria	MV/PI Aid Ratio Criteria	Description
Wealthy	2.4% (Base Index)	≤ 0.4000	High local wealth; tax increases capped at the standard inflation rate.
Economically Disadvantaged	> 2.4% (Adjusted Index)	> 0.4000	Lower local wealth; permitted higher tax increases to generate revenue.

Note. Adapted from *Act 1 index*, by Pennsylvania Department of Education, n.d.

(<https://www.pa.gov/agencies/education/programs-and-services/schools/grants-and-funding/property-tax-relief/act-1-index.html>)

Demographics and District Characteristics

The districts in southeastern Pennsylvania differ in size, socioeconomic status, and student academic performance levels. Of the 92 districts in the region, 80 are classified as suburban, while eight are rural, three are city, and one is town (Geverdt & Maselli, 2024). To emphasize the vast variability in individual district size across the region, the 2018-2019 graduation student data provided a glaring numerical contrast when evaluating the average graduating class size per locale classification. City (3) districts were, on average, the largest in scale, producing 939 graduates per district. In contrast, suburban districts averaged 371 graduates per district, while rural districts averaged 255 graduates, and the single town district recorded only 106 graduates.

These districts, according to data from the PDE, had a diverse range of students, from both low- and high-income areas and varying types of communities. This diversity allowed the researcher to have more nuances in the analysis of the effects of teacher compensation on student academic performance in various settings. City districts, such as those in District 13 and District 56, often experience less funding, more student poverty, and greater needs for special education services (Lapp & Shaw-Amoah, 2023). On the other hand, suburban districts tend to have higher per-pupil funding and more stable economic conditions, which influence the resources that subsidize teacher salaries, and therefore student outcomes (Marz, 2021). Rural districts, like those in A and B counties, have smaller student populations, which affects the way educational resources like teacher salaries are spent and can handicap funding disparities (Americans for Fair Treatment, 2024).

Student Academic Performance Data

The selection of these districts were further justified by the significant variability in student academic performance observed across the region. PSSA and Keystone test data revealed wide disparities, with city districts consistently reporting lower overall achievement compared to their suburban counterparts. For instance, during the 2018-2019 academic year, the proportion of students scoring 'Below Basic' on the PSSAs in the city-classified District 13 was starkly disproportionate: 64.1% in Math and 26.7% in ELA. To contextualize the severity of this underperformance, the southeastern Pennsylvania region averages for 'Below Basic' scores during the same period were only 21.8% for Math and 5.72% for ELA. District 13's significantly higher rates of 'Below Basic' proficiency were largely attributed to compounding systemic challenges, including high poverty rates, quantified by a 4.0% Adjusted Act 1 Index over the 2.4% Base Index, limited educational resources, and overcrowded classrooms (Brown, 2024). The severity of this economic distress was further quantified by the district's 4.0% Adjusted Act 1 Index, which sits well above the 2.4% Base Index in 2018-2019.

On the other hand, wealthy suburban districts in counties such as County B and County G usually recorded above-average student academic performance, and the teachers' salaries, funds spent on schools, and the educators' experience levels could have been responsible for it (Marz, 2021). This study investigated the effect that a teacher's starting salary and the economic context of the district in

which they work had on student academic performance in a range of settings. A review of research by Stone and Peetz (2023) showed that teachers who are compensated more are sometimes linked with better educational results, especially in wealthier school districts that recruit and retain competent teachers. Southeastern Pennsylvania is a diverse place when it comes to student academic achievement and teacher starting salaries. This made it the ideal place to research if a correlation between teacher starting salaries and student academic achievement existed.

Research Sample and Data Sources

The current study's research design used quantitative methods at a correlational scale for analyzing starting salary fluctuations and academic results in 92 southeastern Pennsylvania public school districts. The quantitative, correlational research design functioned as a non-experimental method for studying the relationship scale between variables by processing number-based data without changing variables (Walker, 2019). In addition, the research used intentional sampling to choose these districts because they were near each other and had enough data while also being diverse socioeconomically. The researcher implemented intentional sampling as a non-probability sampling approach which involved choosing participants based on predetermined qualities to manage the sample toward achieving the research goals (Bullard, 2024). A total of seven counties in the southeastern part of Pennsylvania formed the initial group from which all school districts were selected.

The scope of this study was strictly restricted to the 2016-2017, 2017-2018, and 2018-2019 academic years to preserve the validity of the analysis. This triennial period served as a critical baseline, capturing the relationship between teacher starting salaries and student academic achievement within a stable educational environment for students prior to the onset of the COVID-19 pandemic. The pandemic destabilized learning environments, created unequal access to technology, and generated widespread stress to teachers and students alike. Consequently, these compounding disruptions likely resulted in student learning loss. For the southeastern Pennsylvania school districts examined in this study, this pandemic era effectively began following March 13, 2020, which marked the final day of regular in-person instruction. By deliberately excluding data from the pandemic era, this research mitigated the risk of confounding variables associated with these systemic disruptions. This methodological approach ensured that the observed correlations were attributable to the primary variables of interest, namely, teacher salary, student academic performance, and district wealth, rather than the atypical volatility characteristic of the pandemic response. Ultimately, this exclusion facilitated a more reliable, in-depth pattern analysis and significantly enhanced the study's external validity.

The researcher collected data from 92 districts over three academic years from 2016-2017 to 2018-2019. The researcher intentionally selected this period to prevent any influence from the COVID-19 pandemic on instructor recruitment patterns and student academic results. Longitudinal analysis became possible because observations

from each district during each year created a balanced sheet that included all district-year combinations. The sample included a diverse socioeconomic mix: 45 districts were classified as Wealthy, operating under the Base Act 1 Index, and 47 districts were classified as Economically Disadvantaged, operating above the Base with a specified Adjusted Act 1 Index. The main study variables incorporated starting teacher salary together with student assessment results, measured through PSSA and Keystone Exams scores, and graduation rates. The school district served as the unit of analysis, resulting in a study design suited to the structure and scope of the data. This sample size was determined to be statistically adequate for the use of random effects regression modeling. The sample of 92 districts, measured three times, resulted in more than 276 total observations that provided enough statistical power to detect effects of medium strength at 95% confidence while yielding intervals of $\pm 5\%$ under standard district variance assumptions.

Research ethics procedures together with institutional guidelines ensured complete protection of participant rights. Since the data stemmed from publicly available resources containing no information that could identify particular students, teachers and/or administrators, the research received exemption from Institutional Review Board (IRB) review (see Appendix A) as well as time extension to collect data beyond the initial one year granted (see Appendix B). District data, obtained through Right-to-Know (RTK) requests, the PDE, and other public websites, served as accurate, accessible, and transparent data sources. The researcher had no engagement with human research participants and avoided any collection of personal sensitive information. All necessary ethical requirements for secondary data analysis research were maintained throughout the process. The data were used only for academic purposes, stored securely, and reported in aggregate form to prevent any potential risk of re-identification. The research methods maintained both process integrity and protected the privacy rights along with dignity of the persons whose data were included.

6. Instruments and Procedures

Instrumentation

This study employed secondary quantitative data drawn from three main sources to measure and analyze the relationship between minimum teacher salaries and student academic performance. No new instruments were developed. All instruments used were “off-the-shelf,” consisting of standardized test score and graduation data from PDE. The independent variable was the beginning (minimum) salary

for beginning teachers in each of the 92 school districts. These salary figures were stated in gross U.S. dollars and measured annually across three academic years (2016-2017, 2017-2018, and 2018-2019). The salary data represented officially adopted salary schedules (grids), which were typically embedded directly into district, School Board approved, Collective Bargaining Agreements (CBA's). They were sourced directly from primary materials to promote accuracy and consistency. The researcher acquired them through direct solicitation, primarily by submitting requests permitted under the Pennsylvania Right-to-Know Law. Classification of the comparative wealth of the school districts were done by using Pennsylvania's annual Act 1 indices to classify the school districts as Economically Disadvantaged or Wealthy. Pennsylvania utilizes these indices annually as a recurring benchmark to distinguish district wealth and assess levels of economic disadvantage across the Commonwealth.

The dependent variable was student academic performance, quantified using standardized assessment scores from the PSSA and Keystone Exams as well as graduation rates. These assessments were administered Statewide and were designed to evaluate proficiency in core academic subjects such as Mathematics/Algebra 1 and English Language Arts/Literature. The data were collected from the PDE's online assessment databases. Scores were summarized as means at the district level and analyzed across the three years to ensure reliability. A covariate, the district financial health via the Adjusted Act 1 Index data, was included to control for potential confounding variables that may have affected both teacher salaries and student outcomes. The Adjusted Act 1 Index, the State's measure for determining property tax capacity justified by wage inflation, was used as a control variable to account for economic differences amongst the districts in the region (PSEA, 2025). Aiming to isolate the effects of teacher salary from the broader influence of district wealth, the researcher used the Act 1 Index as the primary instrument for socioeconomic classification.

In Table 3 below, districts were bifurcated into two distinct financial tiers based on whether they qualified for an Adjusted Index. This distinction relies on the Market Value/Personal Income (MV/PI) Aid Ratio, where districts with a ratio greater than 0.4000, indicating lower property and income wealth, receive an adjusted, higher index to provide necessary fiscal flexibility. This classification allowed for a clear comparison between wealthy districts and those that were economically disadvantaged. This classification strategy helped isolate the true impact of teacher salaries on student academic performance by reducing potential confounding effects associated with district wealth.

Table 3: School District Financial Health Classification via Act 1 Index (2018-2019)

Socioeconomic Tier	Act 1 Index Type	Criteria (2018-19 Index)	Number of Districts (N)
Wealthy	Base Index	Equal to 2.4%	45
Economically Disadvantaged	Adjusted Index	Greater than 2.4%	47

The reliability and validity of these instruments were considered strong due to their standardization, consistent data collection methods, and official use in statewide (Pennsylvania) evaluation and reporting. PSSA and

Keystone Exams underwent regular psychometric validation and item calibration by PDE. Their scoring processes are transparent, standardized, and publicly documented. The financial and salary data, being official government records,

were also considered reliable and valid sources. No pilot testing was required due to the use of these well-established instruments. The random effects regression model accounted for both fixed and random district-level influences and enhanced internal validity by controlling unobserved heterogeneity, differences across the districts that were not directly measured but may have influenced outcomes. The use of data from multiple academic years also helped improve reliability by reducing bias from year-specific anomalies.

Study Procedures

Data collection involved compiling secondary data from three public sources, which were as follows:

a) Teacher Salary Data: Minimum teacher salaries for each district were collected from publicly available salary schedules posted on district websites, Americans for Fair Treatment, and through Right-to-Know requests. Data were gathered for the academic years 2016-2017, 2017-2018, and 2018-2019.

b) Student Performance Data: Average standardized test scores for each district were retrieved from the PDE’s publicly accessible PSSA and Keystone Exam data portal. Only scores relevant to core subjects (Math, Algebra 1, ELA, Language Arts) were included.

c) District-Level Covariate Data: The geographic locale and Adjusted Act 1 metrics were extracted from PDE and National Center for Education Statistics (NCES) reports, ensuring that economic context and geographic type was accounted for.

All data were compiled into a single data set, aligned by district and academic year. No personally identifiable information was included, and IRB exemption was granted due to the use of publicly available data.

Analytical Flow Process

The data analysis was initiated by importing all the relevant data required by the JASP statistical tool. These were Microsoft Excel files of the test scores, salaries, Act 1 Index, graduation rates, and locale classifications. The raw data required several preprocessing steps, including trimming spaces, normalizing year formats, converting values to numeric types, and renaming columns to maintain consistent naming across data sets (Dhawas et al., 2024). The data was processed, and then enhanced, by generating new variables such as merging percentages of the students at the levels of being “Advance” and the “Proficient” into one parameter: “Percent At or Above Proficient”. This derived value was able to give the researcher a more accurate picture of the student academic performance within districts.

The data sets were subsequently combined into a single table, aligning shared codes such as District, County, and Year. Such a combination allowed the analysis to evaluate the correlation between many of the aspects simultaneously. Once the data were integrated, an exploratory analysis was conducted using correlation tables to identify initial correlations (patterns) between variables such as starting salaries, graduation rates, proficiency scores from standardized tests, and each District’s average Adjusted Act 1 Index. This was followed up with regression modeling that was used to quantify these relationships and to investigate the influence and predictability of select variables (see Figure 4).

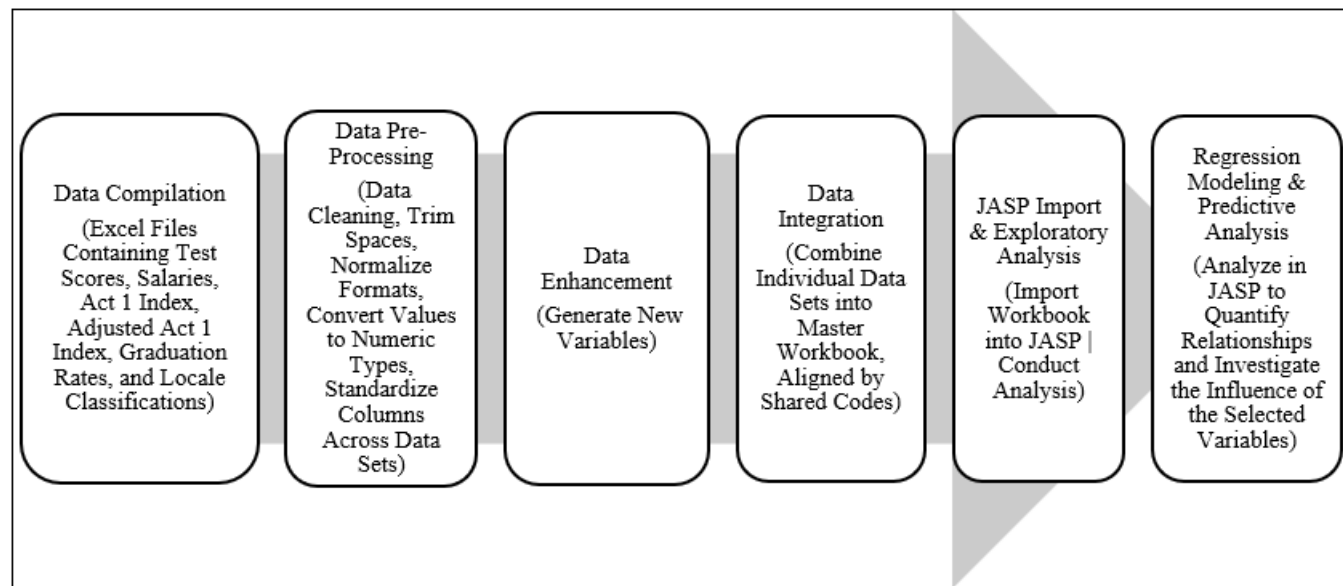


Figure 4: Analytical Flow Chart

Tools and Techniques

The methodology employed a wide array of highly effective tools and a technique to allow critical analysis. Microsoft Excel was the primary source of the structured data sets, and the data was imported to JASP, where the study’s entirely analysis was conducted. After importing the structured data sets from Microsoft Excel, JASP was used to clean the data,

transform variables, and calculate derived metrics, serving as the sole tool for the dissertation’s statistical processing

To handle the data collection and perform statistical computations, the researcher utilized JASP (JASP Team, 2025), an open-source statistical analysis software maintained by the University of Amsterdam to generate visualizations. These visual representations were helpful in

interpreting the data, which allowed for a clear assessment of the trends and associations between financial constraints, salaries, and academic performance. The statistical analysis employed the Regression module in JASP and utilized the Ordinary Least Squares (OLS) method. This framework allowed the study to determine the extent to which teacher starting salaries, student test scores, and Act 1 Index designations predicted graduation rates. The JASP output provided comprehensive model summaries and coefficient tables, reporting key metrics such as R^2 , adjusted R^2 , unstandardized and standardized coefficients, p -values, and confidence intervals, which facilitated a rigorous assessment of the magnitude and significance of each variable's impact.

Statistical Software Environment

All analyses were performed using JASP version 0.95.4, a specialized software package for statistical analysis. This platform provided a dynamic and user-friendly interface to conduct analyses and generate results in a fully reproducible manner. Unlike code-based environments that would have required external libraries, JASP utilized its integrated modules for Descriptives, Regression, and Visualization to execute the study's specific analytical needs.

Most of the data sets were originally compiled as .xlsx files and converted to .csv format to ensure compatibility and data integrity during the import process. The output, including statistical tables and visual figures, was generated instantly within the JASP results panel, allowing for immediate interpretation and assessment of the data patterns.

JASP was selected because it is an open-source platform with a robust infrastructure capable of handling complex statistical tasks without the need for extensive computer programming. Its graphical user interface (GUI) allowed for a systematic organization of the analysis, mirroring the step-by-step approach of the research design. The final merged and cleaned data set was imported as a single .csv file, upon which all subsequent statistical testing and visualization were conducted.

7. Evaluation of the Methodology

Correlation Analysis

To measure the underlying associations of the applied methodology, linear relationships between meaningful variables were first analyzed using JASP-generated Pearson correlation matrices. Specifically, the analysis examined: starting teacher salary, graduation rates, PSSA and Keystone Standardized test scores, and the Adjusted Act 1 Index. These variables were selected based on their relevance to student academic performance, teacher compensation, and the fiscal decision-making frameworks of southeastern Pennsylvania school districts. The cleaned and merged data set was utilized to produce a comprehensive correlation matrix, which was further visualized using scatter plot matrices to facilitate a detailed interpretation of linearity and data distribution.

A Pearson correlation matrix and accompanying scatter plots were utilized to describe the magnitude and direction of association between the variables (Conlon et al., 2020). Notably, the analysis revealed a moderate positive

relationship between starting teacher salaries and graduation rates, where higher starting salaries were statistically shown to align with higher graduation outcomes. Conversely, the Adjusted Act 1 Index displayed a negative correlation with both test scores and graduation rates, implying that districts who operated under more restrictive fiscal climates face challenges in maintaining high student academic performance. This exploratory preliminary phase verified several hypothesized relationships, which guided the direction of the subsequent statistical modeling.

Regression Modeling and Predictive Analysis

After the preliminary correlation analysis, a more rigorous statistical examination was conducted using the Linear Regression module in JASP. An OLS regression model was constructed to evaluate the collective impact of the selected predictors on student outcomes. In this model, the graduation rate was designated as the dependent variable, while the independent variables, entered as covariates, included starting teacher salary, the Adjusted Act 1 Index average (computed over three academic years), and key test performance indicators. This multivariate approach allowed for the assessment of each variable's unique contribution to graduation rates while statistically controlling for the others.

The regression model yielded an R^2 value of 0.695, indicating that approximately 69.5% of the variance in graduation rates was accounted for by the chosen predictors. While this effect size suggests a strong model fit, the significance of individual predictors varied. An examination of the coefficients and p -values revealed that performance on both PSSA and Keystone exams served as robust, statistically significant predictors of graduation rates, characterized by low p -values and positive coefficients. These results substantiated the conclusion that student academic performance was a critical determinant of graduation outcomes. Conversely, while the Adjusted Act 1 Index demonstrated a strong inverse relationship in the correlation analysis, its specific influence within the regression model was less pronounced, likely due to shared variance with academic scores. Finally, starting teacher salary, despite showing a positive bivariate correlation, presented a non-significant coefficient in the multivariate model with a probability value of $p = .116$, suggesting that its direct predictive impact on graduation rates is less definitive when controlling for student academic proficiency.

Visualization-Based Evaluation

Along with statistical models, a number of visual methods were employed to examine trends and validate the regression results. Regression trendlines were generated within scatter plots to demonstrate the connection between starting teacher salary, student graduation rates, and testing proficiency levels. These graphs corroborated the model results by visually indicating positive gradients between academic performance and salary levels.

Additionally, scatter plot matrices were produced to investigate the multidimensional relationships between Adjusted Act 1 Index values, teacher salaries, and standardized test scores. These visualizations revealed clustering and distribution patterns that aligned with the preceding correlation matrix. To assess longitudinal trends,

descriptive plots illustrating the year-wise averages of salary and graduation rates for the 2016-2017, 2017-2018, and 2018-2019 academic years were generated. These charts depicted a general upward trajectory for both variables, potentially indicating time-based adjustments and policy modifications driving performance. These visual outputs were instrumental in confirming quantitative findings and ensuring transparency and ease of data interpretation.

Geographical Context and Locale Classification

Along with the numeric and statistical data, the analytical strategy also incorporated geographical and contextual data derived from the Locale Data sheet. This data categorized the districts into suburban, rural, city, and town classifications. To analyze the distribution of these categories, the researcher utilized the 'Descriptive Statistics' module in JASP to generate frequency tables and distribution plots. This analysis produced percentage spreads, which were visualized through pie charts and bar plots to illustrate the proportion of districts within each locale type.

The results implied that suburban districts represented the most significant portion of the data, followed by rural, city, and town districts (Terbeck, 2020). These figures provided critical background data regarding academic and salary trends. Suburban districts, which generally possess greater flexibility regarding taxation and funding, may influence higher starting teacher salaries and, consequently, student academic performance. The inclusion of this dimension allowed for the consideration of structural and socio-economic variations existing among different locale types. This background information provided essential context for interpreting the statistical findings within the realities of actual learning environments.

Data Analysis

The research employed a quantitative and correlational research design to explore the relationship between initial teacher compensation and student academic performance across 92 southeastern Pennsylvania K-12 public school districts. The data analysis procedure involved several distinct steps utilizing JASP software to address the research questions and hypotheses of this research study. For example, to evaluate the correlation between student academic performance and starting teacher salary, a Linear Mixed Model (LMM) was utilized. According to Braga et al. (2022), mixed models are statistical methods employed to examine data with several observations over time or across groups, controlling for variation between these groups by considering some effects as random variables. This model is particularly suited for panel data, where several observations are available for every district over time. By utilizing the LMM module in JASP, the researcher controlled for unobserved heterogeneity between districts, modeling district-specific effects as uncorrelated with the descriptive variables. This allowed the researcher to incorporate time-varying and constant variables into the analysis of the data in a comprehensive manner.

All statistical analyses were performed using JASP 0.95.4. JASP provided a user-friendly interface that supported the statistical analyses (The JASP Team, 2025), making it an ideal choice for this study. To analyze models with panel

data, the LMM module was employed. This module was designed to estimate models that accounted for observations collected across both time and cross-sectional units (e.g., school districts over multiple years). This approach was particularly useful for fitting random effects regression models, which assumed that individual-specific effects are random and uncorrelated with predictor variables. The software also provided options to correct for potential violations of classical regression assumptions, ensuring robust standard error estimation.

Meanwhile, to test Research Question 3, which investigated whether district-level moderation exists between student academic performance and teacher salaries in districts with considerable financial difficulties, a moderation analysis was implemented. This analysis was conducted using the Linear Regression module in JASP, utilizing the method of entering interaction terms into the model builder. Moderation analysis determined if the direction or strength of the association between an independent variable and a dependent variable varies based on the level of a third variable, referred to as the moderator (Hair et al., 2018).

In this research, the moderator variable was district financial health, as indicated by the Adjusted Act 1 Index. An interaction term between teacher salary and district financial health was included in the regression model to test for moderation effects. This term was generated by multiplying the centered values of teacher salary and district financial health. The significance of this interaction was evaluated via *t*-statistics within the JASP coefficient tables, and the results were interpreted to determine whether financial pressures significantly altered the impact of teacher salaries on student academic performance.

Consequently, the data analysis techniques applied in this research were aimed at testing the hypotheses and responding to the research questions comprehensively. Through the employment of suitable statistical models within the JASP environment, the researcher provided valid and reliable information on the correlation between teacher starting salary and student academic performance, considering the nuanced effects of district fiscal health and geographic type.

Role of the Researcher

In this quantitative, non-experimental, correlational study, the role of the researcher was strictly observational and analytical. Because the study relied entirely on the collection and analysis of secondary data, the researcher had no direct interaction with human subjects. Consequently, the traditional risks of researcher-participant influence, often found in qualitative or experimental research, were eliminated. The researcher's primary responsibilities included aggregating the datasets, cleaning and preprocessing the data for consistency, and executing the statistical modeling using JASP software.

However, the researcher's assumptions still shaped the study's conceptualization. Grounded in Human Capital Theory, the researcher assumed that financial investment in educators serves as a primary driver of teacher quality and, by extension, student academic performance. Additionally, it was assumed that standardized test scores and cohort

graduation rates were valid and comprehensive metrics for quantifying academic success.

Because the researcher is a professional within the educational field, there was an inherent risk of confirmation bias, specifically, a predisposition to favor findings linking higher compensation to improved student outcomes. To actively mitigate this bias, strict methodological boundaries were maintained. First, the pre-pandemic timeframe (2016-2017 –2018-2019) was deliberately pre-selected to prevent any subjective cherry-picking of data. Second, the analysis relied entirely on objective mathematical outputs from the JASP software. By adhering to standardized statistical thresholds (e.g., evaluating significance strictly at the .05 alpha level) and established regression models, the researcher ensured that the interpretation of the results were driven solely by the data rather than personal or professional viewpoints.

8. Ethical Assurances

The researcher completed CITI training (see Appendix C) and secured IRB approval from Gwynedd Mercy University under exempt status before beginning data collection. According to the IRB, a participating risk assessment showed the study focused on analyzing publicly available de-identified data that presented minimal risk. The public records obtained from PDE and K-12 public school districts qualified as non-human subject data since no personal information was examined or collected and were properly acknowledged. Because the data were compiled at the aggregate, district level, individual identifiers were not present, minimizing concerns related to personal privacy.

Secure multi-factor authentication and password protection guarded the data sets while stored on the computer with restricted access solely granted to the researcher. Analytical procedures along with system protocols ensured individual and district identity protection after preventing unauthorized information exchanges between people. The data was kept securely in accordance with the IRB's destruction guidelines. The researcher maintained objective behavior in the entire study using standardized statistical approaches with established data analysis procedures. Research eliminated subjective opinions through its exclusive use of tested quantitative methodologies and official data resources. The researcher limited their participation to analyzing and interpreting data while keeping their influence separate from data collection and the original data sources. Furthermore, the researcher safeguarded participant privacy and protected data integrity through controlled ethical methods that applied to research work involving secondary data.

9. Summary

A quantitative, non-experimental, correlational data-driven analysis with secondary data investigated links between starting teacher salaries and student academic performance in 92 public school districts across southeastern Pennsylvania. The research evaluated whether raising the initial teacher wage affected student academic outcomes shown through PSSA and Keystone Exam scores from the 2016-2017, 2017-2018, and 2018-2019 years. This study

analyzed how financial constraints, which are measured through the Adjusted Act 1 Index, impact the relationship under investigation. The study evaluated relationships through random effects regression modeling while accounting for unknown district-level patterns. The researcher gathered data through public salary schedules together with PDE assessment databases and State financial reports. The study analyzed three variable types like teacher starting salary (independent), student academic performance (dependent), and district financial health and locale (covariate).

The researcher ensured ethical standards by completing CITI trainings, securing IRB exemption and working with publicly accessible, identity-masked data. Standardized and validated testing instruments (PSSA and Keystone assessments and district salary/finance records) provided consistent results between districts during different years. Random effects regression modelling served as the analytical methodology to evaluate correlations while mitigating undisclosed variations between districts. A data set spread across multiple years delivered more than 279 valid observations which reached statistical significance for medium-size impacts (effect) at 95% confidence. The analysis used data aggregation through statistical software, R, while maintaining comprehensive documentation for future replication. The study design delivered a strong understanding of how teacher salary affects academic results in diverse schools when considered against regional economic circumstances.

10. Results and Analysis

This chapter outlines the findings of the study that were carried out to test if a relationship exists between teacher starting salary and student academic performance in school districts in the region of southeastern Pennsylvania. It was conducted on detailed data that involves graduation rates, standardized test scores (PSSA and Keystone Exams), salary data, the Adjusted Act 1 Index, and geographical locale classifications. The statistical methods of interpretation of such results were associations and correlation analysis, as well as regression modeling, with supporting visualizations.

Overview of the Data

This analysis examined the financial performance of various school districts located in southeastern Pennsylvania. The data set combined various sources of data, such as standardized test performance (PSSA and Keystone), starting teacher salaries, graduation rates, and the Act 1 Index over three years of performance (2016-2017, 2017-2018, and 2018-2019). The first data snapshot was the district-level distribution of the sensitive variables, PSSA and Keystone Exam scores by gender, graduation rates, and starting teacher salaries. This systematic combination allowed a reasonable multivariate analysis, because all the measures were connected to a homogeneous temporal and spatial coordinate. Notably, all districts had equally complete financial and performance data, though missing values occurred within the salary data and were addressed during the preprocessing stage. It was on this data that correlation analysis and regression modeling were based, as discussed in the following sections. The visual summaries also put critical

numeric patterns into perspective, setting the foundation to further examine the data set statistically (see Figure 5).

County	District	Year	Number Scored	PSSA 3-8 Math ALL Data	PSSA 3-8 ELA ALL Data	Keystone 11 Alg. 1 ALL Data	Keystone 11 Lit. ALL Data	Starting Salary	Graduation Rate	Wealth Classification Avg.	Act 1 Index Avg.
G	72	2016-17	3,493.00	61.50	78.90	84.80	91.10	45,747.00	0.93	Rich	0.037
G	72	2017-18	3,534.00	58.10	77.60	80.80	88.90	47,000.00	0.92	Rich	0.037
G	72	2018-19	3,595.00	57.60	76.40	81.90	86.90	47,400.00	0.95	Rich	0.037
E	56	2016-17	6,712.00	20.10	34.80	32.30	42.10	45,114.00	0.71	Poor	0.024
E	56	2017-18	6,819.00	19.90	35.40	30.90	38.30	46,558.00	0.72	Poor	0.024
E	56	2018-19	7,023.00	18.50	34.30	27.90	38.30	45,595.33	0.72	Poor	0.024

Figure 5: Sample Data Overview

Note. Figure compiled using data from District 56 & District 56 Education Association, 2015, and District 72 & District 72 Education Association, 2014, 2017.

Validity and Reliability

To ensure data integrity, the study utilized established, secondary data sources rather than researcher-created instruments. Prior to the researcher using the data, PDE subjected the PSSA and Keystone Exams to regular psychometric validation and item calibration, ensuring the construct validity and internal consistency of the academic performance metrics. Similarly, financial and salary data were extracted from legally binding collective bargaining agreements and official PDE Act 1 Index reports, providing high objective reliability for the independent variables.

Prior to executing the Ordinary Least Squares (OLS) regression and Linear Mixed Models (LMM), the data were assessed to ensure they met the necessary statistical assumptions. Linearity was visually confirmed through JASP-generated scatter plot matrices, which demonstrated clear linear relationships between the predictor variables (e.g., starting salary, Adjusted Act 1 Index) and the dependent variables (e.g., graduation rates, standardized test scores). The normality was assessed via density plots; starting salaries exhibited a relatively normal distribution, while graduation rates displayed a negative skew, indicating a ceiling effect common in high school graduation data. To satisfy the assumption of independence and control for unobserved heterogeneity across the multi-year panel data, the LMM framework modeled district-specific effects as random variables.

Several factors impacted the interpretation of these findings. First, the correlational design established predictive associations, not causal relationships. Second, the sample was geographically skewed, with suburban districts comprising 87.0% of the data set. This overrepresentation indicated that aggregate regional trends were heavily influenced by suburban structural advantages, limiting generalizability to rural or city locales. Lastly, while restricting data to the pre-pandemic academic years (2016-2017, 2017-2018, and 2018-2019) enhanced internal validity by isolating variables from emergency disruptions, it required caution when generalizing results to post-pandemic educational environments.

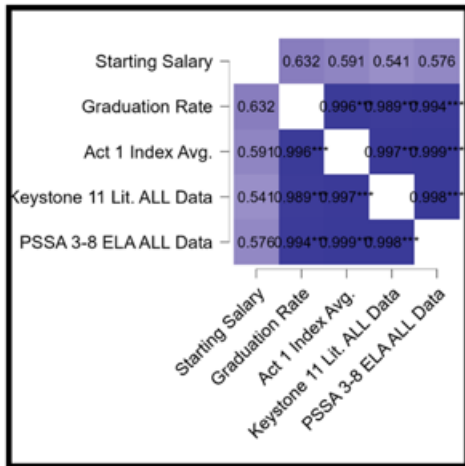
11. Results

To examine the interrelationships among pivotal educational and financial indicators, including starting teacher salary, the Adjusted Act 1 Index average, and student academic performance (measured via graduation rates and standardized PSSA and Keystone exams), a Pearson correlation matrix with accompanying scatter plots was generated using JASP. This analysis, presented in Figure 6, statistically and visually delineates the nature of the relationships between these variables. In this display, positive correlations are indicated by positive coefficients (r) and upward-sloping regression lines, while negative correlations are evidenced by negative coefficients and downward trends.

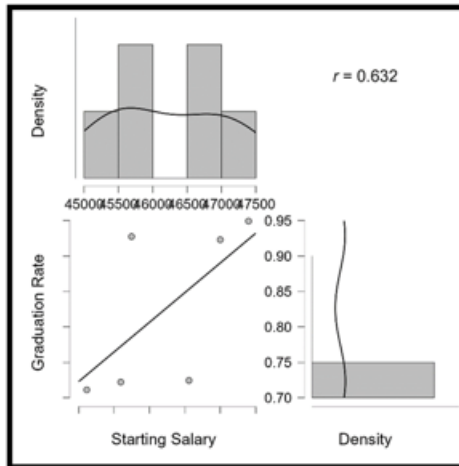
Based on the matrix, standardized test scores were strongly and positively linked to graduation rates. Specifically, the scatter plots for Keystone Literature and PSSA ELA scores demonstrated a consistent linear relationship with increasing graduation levels, suggesting that higher academic proficiency at various grade levels is a significant factor contributing to better student completion rates. Additionally, there was a moderate positive correlation between starting teacher salaries and graduation rates. This was visually represented by a positive gradient in the scatter data, supporting the argument that southeastern Pennsylvania school districts with higher compensation tend to achieve stronger outcomes among their students.

Notably, the Adjusted Act 1 Index average exhibited a moderate-to-strong negative correlation with both test scores and graduation rates. In the scatter plot matrix, this inverse relationship was characterized by a distinct downward slope, confirming the premise that greater financial pressure (as indicated by a higher Adjusted Act 1 Index score) is associated with lower student academic performance. This analysis acted as an essential quantitative verification of the socioeconomic disparities affecting educational performance (see Figure 6).

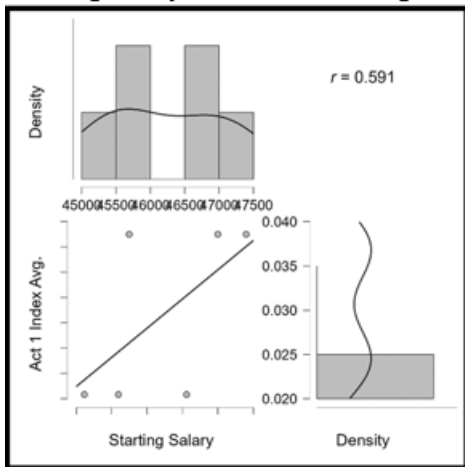
Correlation Matrix



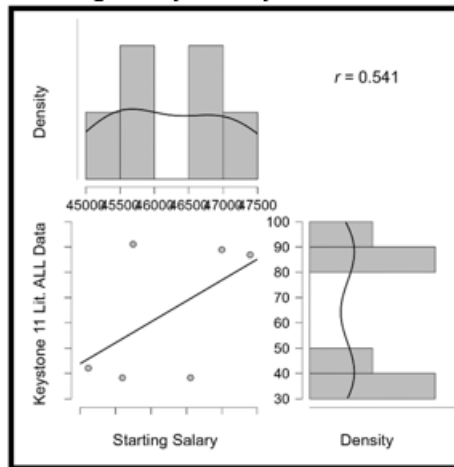
Starting Salary vs. Graduation Rate



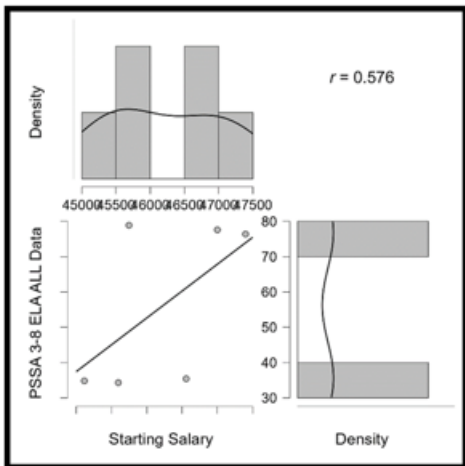
Starting Salary vs. Act 1 Index Avg.



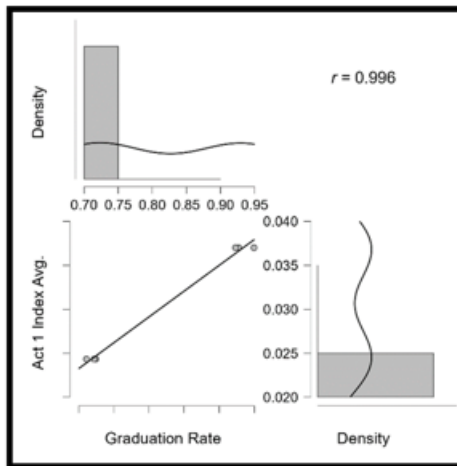
Starting Salary vs. Keystone 11 Lit. ALL Data



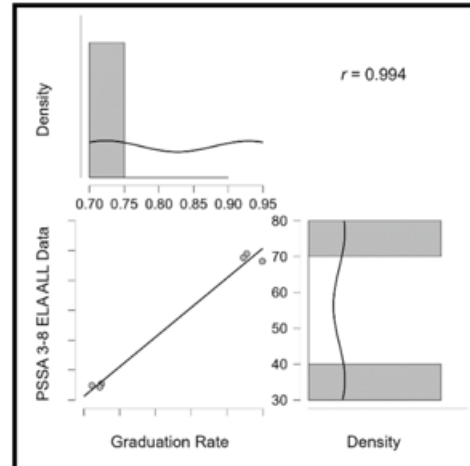
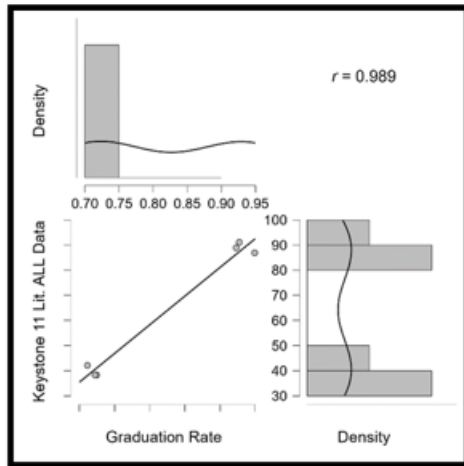
Starting Salary vs. PSSA 3-8 ELA ALL Data



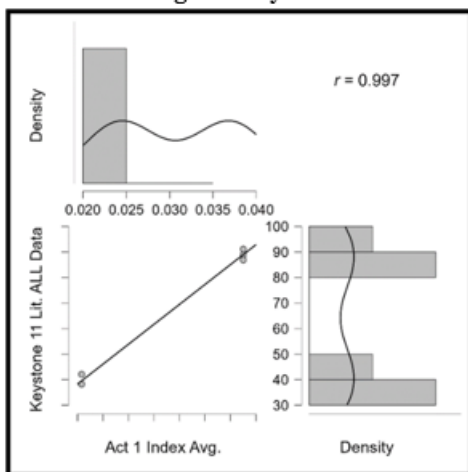
Graduation Rate vs. Act 1 Index Avg.



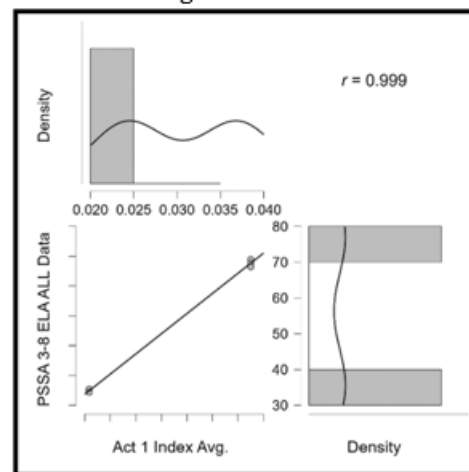
Graduation Rate vs. Keystone 11 Lit. ALL Data Graduation Rate vs. PSSA 3-8 ELA ALL Data



Act 1 Index Avg. vs. Keystone 11 Lit. ALL Data



Act 1 Index Avg. vs. PSSA 3-8 ELA ALL Data



Keystone 11 Lit. ALL Data vs. PSSA 3-8 ELA ALL Data

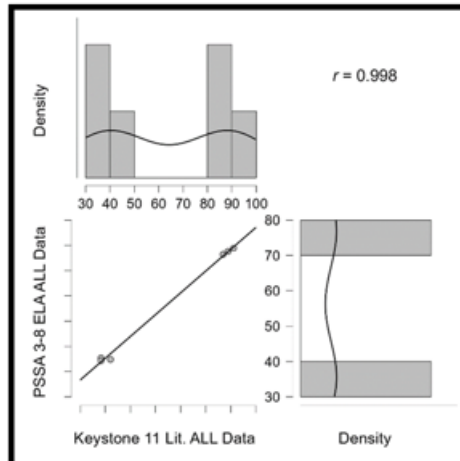


Figure 6: JASP Correlation Matrix and Scatter Plot Grid

Regression Analysis

An OLS regression analysis was conducted using the Linear Regression module in JASP to measure the combined influence of financial and academic performance variables on graduation rates. In this model, graduation rate served as the dependent variable, while the independent variables (covariates) included starting salary, the average Adjusted Act 1 Index, Keystone Literature scores, and PSSA ELA scores.

The JASP Model Summary yielded an R^2 value of .626, indicating that approximately 62.6% of the variability in graduation rates was accounted for by the selected predictors. This result is classified as having a moderately strong level of explanatory power within the context of educational data analysis.

Inspection of the Coefficients table revealed distinct patterns of significance among the predictors:

a) Academic Indicators: Both Keystone Literature and PSSA ELA scores were statistically significant predictors. They exhibited positive unstandardized coefficients (B) of 0.120 ($p < .05$) and 0.223 ($p < .05$), respectively, illustrating the significant and direct role that academic proficiency plays in driving student graduation outcomes.

b) Financial Distress: The coefficient for the Adjusted Act 1 Index was negative and statistically significant at the .05 alpha level. This finding provides further empirical support for the premise that increased financial constraints, measured by a higher Adjusted Act 1 Index, are associated with a significant decrease in graduation rates.

c) Teacher Salary: Notably, starting teacher salary displayed a positive relationship with graduation rates; however, the p

value was observed to be slightly above the .05 threshold, implying marginal or borderline significance. Despite this, its inclusion in the model visually aligns with historical trends observed in the descriptive phase.

Model	R	R ²	Adjusted R ²	RMSE
M ₀	0.000	0.000	0.000	7.652×10 ⁻⁴
M ₁	0.833	0.695	0.690	4.260×10 ⁻⁴

Note. M₁ includes Starting_Salary, Act_1_Index_Avg, Keystone_11_Lit_Score, PSSA_3-8_ELA_Score

Model		Unstandardized	Standard Error	Standardized	t	p
M ₀	(Intercept)	0.009	4.606×10 ⁻⁵		197.634	< .001
M ₁	(Intercept)	0.006	6.622×10 ⁻⁴		9.611	< .001
	Starting_Salary	-1.425×10 ⁻⁸	9.041×10 ⁻⁹	-0.057	-1.576	.116
	Act_1_Index_Avg	0.243	1.129	0.013	0.215	.830
	Keystone_11_Lit_Score	1.521×10 ⁻⁵	3.871×10 ⁻⁶	0.278	3.929	< .001
	PSSA_3-8_ELA_Score	3.165×10 ⁻⁵	4.448×10 ⁻⁶	0.609	7.116	< .001

Figure 7: JASP Linear Regression Output – Model Summary and Coefficients for Predictors of Graduation Rate

Visual Analysis of Regression Trends

To visually assess the strength and nature of the relationships between teacher starting salaries and student academic performance indicators, several regression-based visualizations were generated using JASP. Specifically, the analysis utilized bivariate scatter plots with overlaid regression lines and comprehensive scatter plot matrices to inspect linearity and distribution. The first scatter plot (see Figure 8) illustrated the connection between starting salary and graduation rates across the three academic years: 2016-2017, 2017-2018, and 2018-2019. A linear regression trend line fitted to the data indicated that higher starting salaries are generally associated with higher graduation rates. Despite some dispersion in the data points, the positive slope of the trend line suggested a modest, yet identifiable, influence of starting teacher salary on student graduation rates.

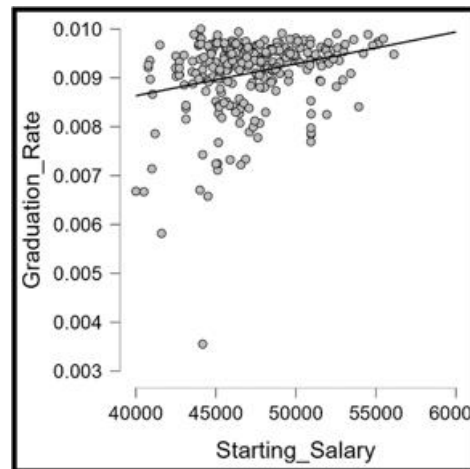


Figure 8

Scatter Plots with Regression Lines: Starting Salary vs. Graduation Rate (Top) and PSSA ELA Performance (Bottom)

Top

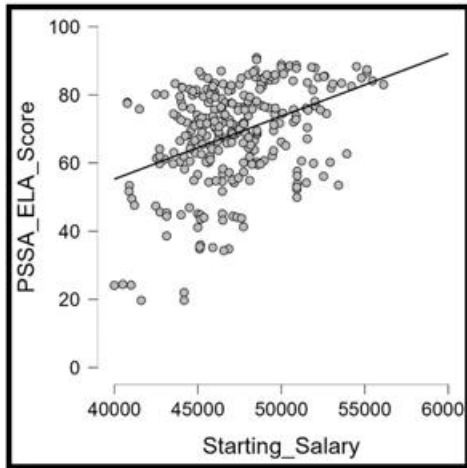
A Pearson correlation analysis revealed a significant positive association between starting teacher salaries and cohort graduation rates, $r(274) = .263, p < .001$

		Pearson's r	p
Starting_Salary	- Graduation_Rate	0.263	< .001

Bottom

Similarly, a Pearson correlation analysis demonstrated a statistically significant moderate positive relationship between starting teacher salaries and PSSA ELA proficiency scores, $r(274) = .386, p < .001$

		Pearson's r	p
Starting_Salary	- PSSA_ELA_Score	0.386	< .001



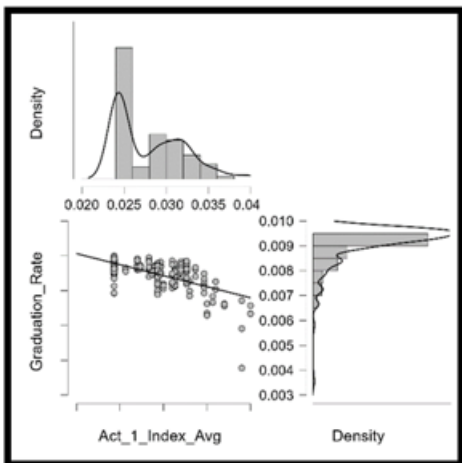
The second scatter plot within the analysis examined the relationship between starting teacher salary and student PSSA 3-8 ELA test performance. Consistent with the graduation data, a positive gradient was observed, implying that districts offering higher starting teacher salaries tended to report better standardized test scores among students. These visual findings aligned with the bivariate correlations, which showed a clear positive trend, although the formal multivariate regression model suggested that this relationship was complex and likely mediated by broader socioeconomic factors.

Additionally, a scatter plot matrix was utilized to explore multidimensional correlations involving the Adjusted Act 1 Index, starting salaries, and achievement metrics (see Figure 9). Unlike the singular plots, this matrix provided a simultaneous view of all bivariate relationships. Notably, a distinct negative correlation was observed between the Adjusted Act 1 Index and student outcomes, reinforcing the assertion that financial constraints, manifested as a higher Act 1 Index, could hinder student academic performance. The combination of these JASP-generated visual tools offered a compelling and transparent view of the overall trends.

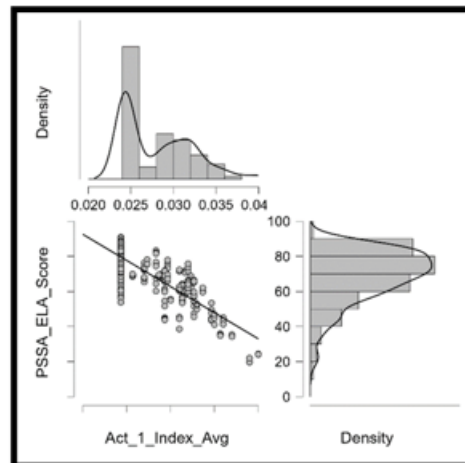
Pearson's Correlations		Pearson's r	p
Act_1_Index_Avg	- Graduation_Rate	-0.682	< .001
Act_1_Index_Avg	- PSSA_ELA_Score	-0.832	< .001
Act_1_Index_Avg	- Starting_Salary	-0.350	< .001
Graduation_Rate	- PSSA_ELA_Score	0.821	< .001
Graduation_Rate	- Starting_Salary	0.263	< .001
PSSA_ELA_Score	- Starting_Salary	0.386	< .001

Figure 9: Scatter Plot Matrix: Adjusted Act 1 vs. Achievement Metrics

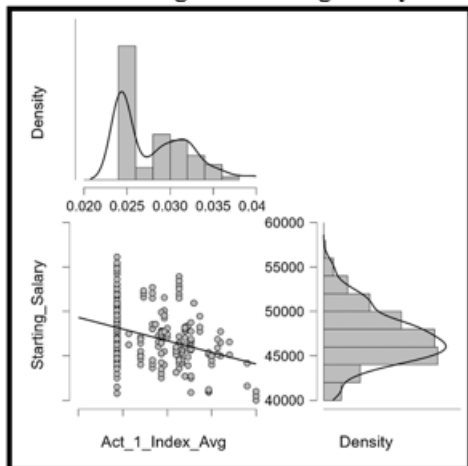
Act 1 Index Avg. vs. Graduation Rate



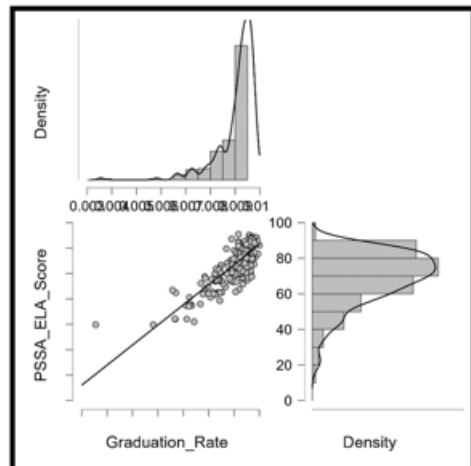
Act 1 Index Avg. vs. PSSA ELA Score

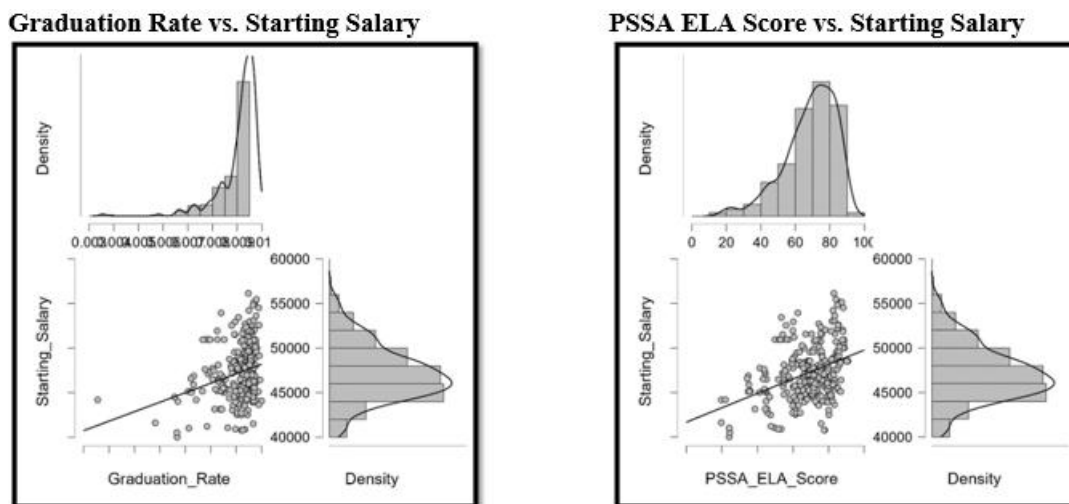


Act 1 Index Avg. vs. Starting Salary



Graduation Rate vs. PSSA ELA Score





Multidimensional Pattern Analysis

To investigate the data beyond simple bivariate relationships, a scatter plot matrix was generated using the Correlation module in JASP. This visualization facilitated a multidimensional assessment of the interactions between the Adjusted Act 1 Index average, starting teacher salaries, graduation rates, and standardized test scores (PSSA and Keystone Exams). By displaying these variables in a grid format, the researcher was able to inspect overall linearity, distribution shapes via diagonal density plots, and potential outliers within a single comprehensive figure.

The most significant finding from this matrix was the distinct negative relationship between the Adjusted Act 1 Index and measures of student academic achievement. As illustrated in the scatter plots, higher Adjusted Act 1 Index values (indicative of lower property wealth and greater financial stress) were consistently associated with lower graduation

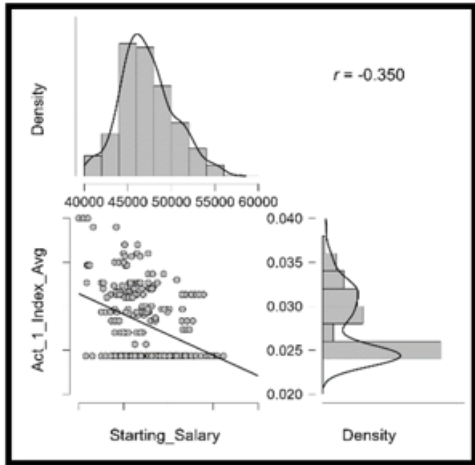
rates and standardized test scores, evidenced by the downward-sloping regression trends in the corresponding grid cells.

Furthermore, clustering patterns were evident within the plots, revealing how districts grouped according to their financial and academic attributes. The density plots along the diagonal revealed that while graduation rates were heavily skewed toward the higher end (indicating a ceiling effect), starting salaries followed a more normal distribution. Visually, districts with higher starting salaries frequently clustered in the upper quadrants of academic performance, providing visual cross-validation of the positive Pearson correlation coefficients (*r*) displayed within the matrix. In general, the JASP scatter plot matrix offered a detailed observation of how educational performance relies on economic conditions, reinforcing the findings of the univariate and bivariate analyses (see Figure 10).

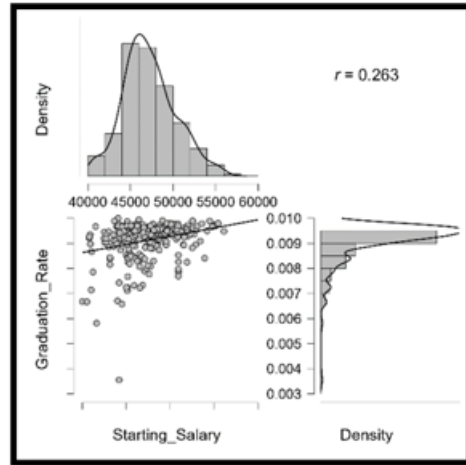
		Pearson's r	p
Starting_Salary	- Act_1_Index_Avg	-0.350	< .001
Starting_Salary	- Graduation_Rate	0.263	< .001
Starting_Salary	- PSSA_3-8_ELA_Score	0.386	< .001
Starting_Salary	- Keystone_11_Lit_Score	0.324	< .001
Act_1_Index_Avg	- Graduation_Rate	-0.682	< .001
Act_1_Index_Avg	- PSSA_3-8_ELA_Score	-0.832	< .001
Act_1_Index_Avg	- Keystone_11_Lit_Score	-0.749	< .001
Graduation_Rate	- PSSA_3-8_ELA_Score	0.821	< .001
Graduation_Rate	- Keystone_11_Lit_Score	0.786	< .001
PSSA_3-8_ELA_Score	- Keystone_11_Lit_Score	0.880	< .001

Figure 10: JASP Scatter Plot Matrix – Multidimensional Relationships among Salary, Act 1 Index, and Academic Outcomes

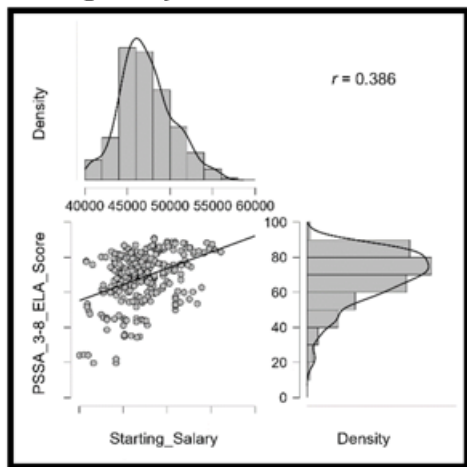
Starting Salary vs. Act 1 Index Avg.



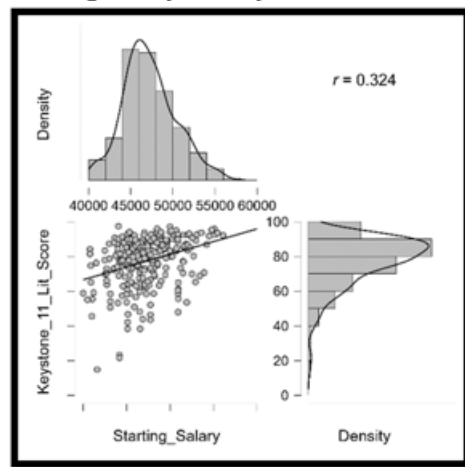
Starting Salary vs. Graduation Rate



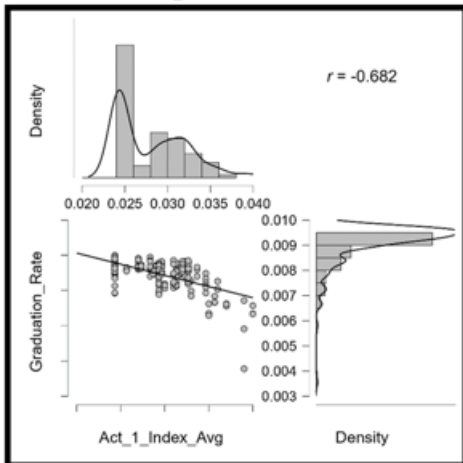
Starting Salary vs. PSSA 3-8 ELA Score



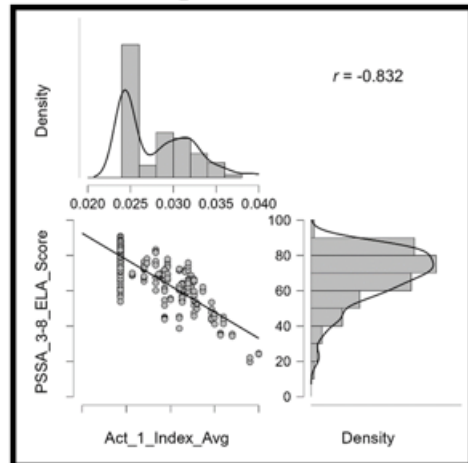
Starting Salary vs. Keystone 11 Lit Score



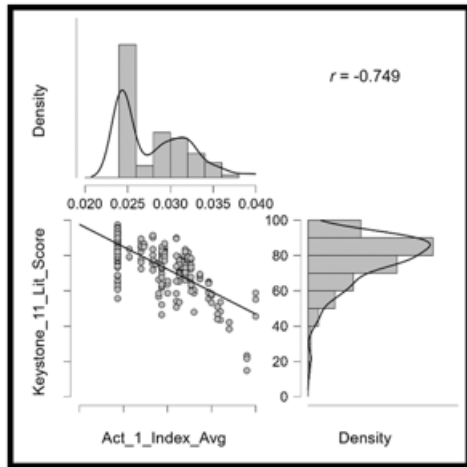
Act 1 Index Avg. vs. Graduation Rate



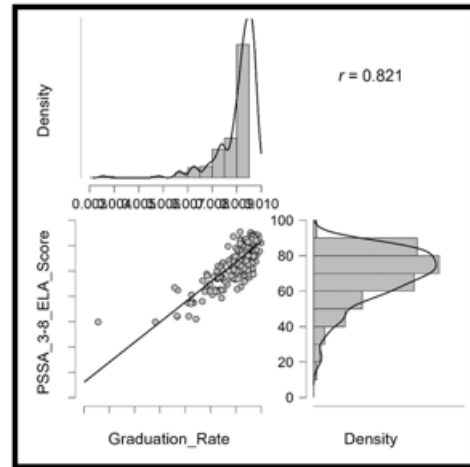
Act 1 Index Avg. vs. PSSA 3-8 ELA Score



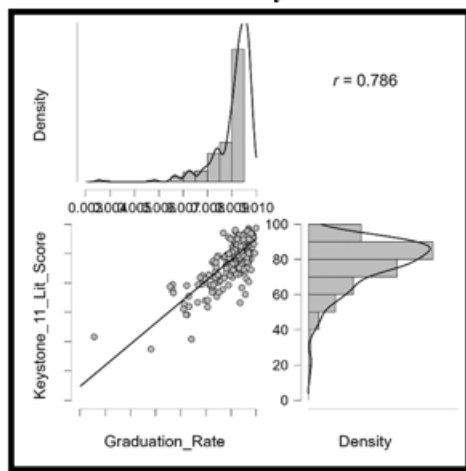
Act 1 Index Avg. vs. Keystone 11 Lit Score



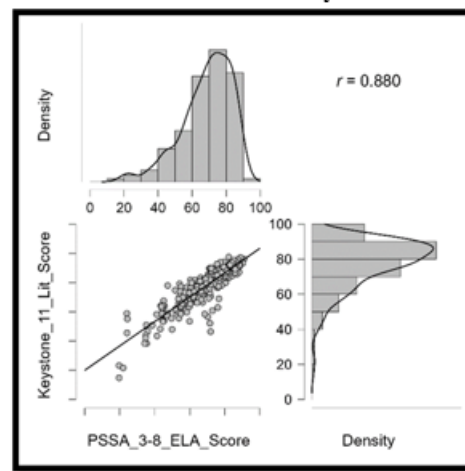
Graduation Rate vs. PSSA 3-8 ELA Score



Graduation Rate vs. Keystone 11 Lit Score



PSSA 3-8 ELA Score vs. Keystone 11 Lit Score



Locale-Based Classification Analysis

To contextualize the statistical findings, the study examined the spatial distribution of school districts based on their locale classification (Suburban, Rural, City, and Town). Using the Descriptive Statistics module in JASP, frequency analyses were conducted to generate distribution plots. The pie chart in Figure 11 demonstrated the proportional composition of the sample. The data set was overwhelmingly dominated by suburban districts, which accounted for 87.0% ($n = 80$) of the total. Rural districts represented the second largest group at 8.7% ($n = 8$), followed by city districts (3.3%, $n = 3$) and town districts (1.1%, $n = 1$). This prominent lopsidedness highlighted that the study’s findings were heavily influenced by the suburban context of southeastern Pennsylvania.

The bar chart in Figure 12 further quantified this distribution by displaying the raw count of districts within each category. This structural imbalance was critical for interpreting the study’s financial and academic results. As noted in the literature, suburban districts are often characterized by superior infrastructure, higher funding levels, and greater consistency in educational provision (Logan et al., 2012). Consequently, their overrepresentation in the data set may have driven the observed aggregate trends of higher starting salaries and graduation rates.

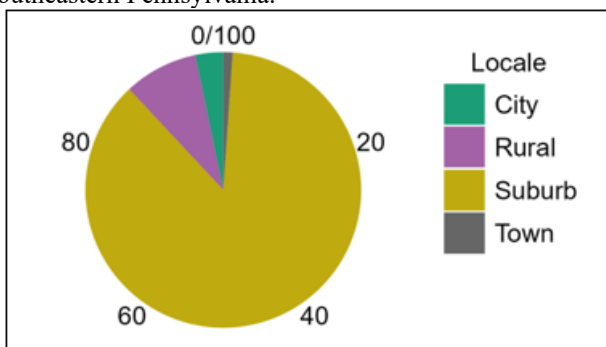


Figure 11: JASP Pie Chart – Percentage Distribution of District Locales

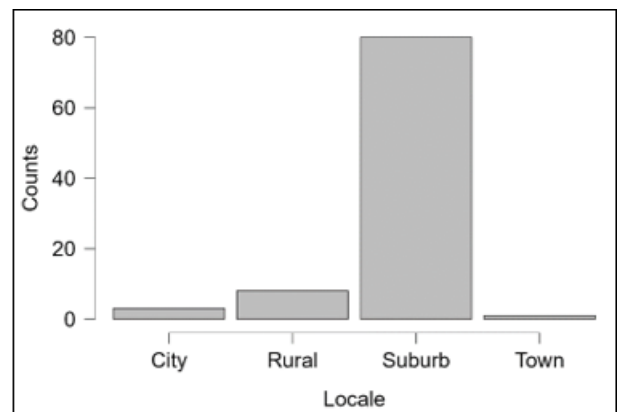


Figure 12: JASP Bar Chart – Frequency of Districts by Locale

By controlling for and visualizing these locale classifications, the analysis provided essential structural context. It suggested that the "regional" performance was largely a reflection of suburban resource advantages, rather than a uniform pattern across all geographic types.

Summary

In summary, the data analysis conducted via JASP has provided nuanced evidence regarding the relationship between teacher compensation, district financial health, and student academic outcomes. The correlation matrices and scatter plot visualizations confirmed that starting teacher salary shares a statistically significant, positive association with both standardized test scores and graduation rates. However, the multivariate regression analysis clarified the complexity of this relationship, revealing that student academic performance, as measured by PSSA and Keystone exams, served as the primary direct predictor of graduation outcomes, potentially mediating the influence of salary.

Additionally, the Adjusted Act 1 Index demonstrated a strong inverse relationship with student achievement in the bivariate analyses, highlighting how greater financial distress consistently correlates with lower performance metrics. Finally, the locale-based analysis revealed that these trends were situated within a predominantly suburban framework (87%), suggesting that the region's socioeconomic and geographic resource advantages provide a distinct structural context for these educational patterns. These findings set the stage for the discussion of implications, limitations, and recommendations in Chapter 5.

12. Implications, Recommendations, and Conclusions

In this chapter, the results of the research study that examined the correlation between starting teacher salaries and student academic performance within K-12 public school districts in the southeastern Pennsylvania region were presented. The study considered how the number of debates, notably in the Commonwealth of Pennsylvania, concerning fair pay and equity in education has grown and provided the opportunity to determine whether engagement of financial funding of a starting teacher salary is a predictor to academic success of the student. The study utilized a quantitative methodology and employed multi-year data that covered high school graduation levels, standardized tests (PSSA and Keystone Exams) indicators, financial health (Act 1 Index), and starting teacher salaries.

The study utilized a quantitative methodology and employed multi-year data that covered high school graduation levels, standardized tests (PSSA and Keystone Exams) indicators, financial health (Act 1 Index), and starting teacher salaries. To make the analysis stable, the researcher utilized JASP software to generate statistical instruments such as Pearson correlation matrices for identifying relationships between variables and OLS regression models for identifying the predictive value of significant financial and academic variables. Crucially, this study stratified districts into "Wealthy" and "Economically Disadvantaged" tiers based on the Act 1 Index to better understand how fiscal health impacts these outcomes. Data preparation and the production

of descriptive visualizations contributed to better clarity and interpretation of findings. The hypothesis under which the study progressed argued that teacher starting salary was an essential aspect of district-level investment and can be correlated with quantifiable academic results.

This chapter proceeded to combine the major findings stemming from the study, highlighting the nature and strength of associations between financial and performance indicators. It also critically examines the methodological and contextual limitations, specifically regarding the pre-pandemic timeframe, that may have influenced the results, and it proposes practical, evidence-based recommendations for educational policymakers, school leaders, and funding authorities. Furthermore, this chapter outlines directions for future research, including the need for broader data sets, qualitative insights, and longitudinal analyses to better understand the long-term impact of fiscal policies on student academic performance and educational equity.

Summary of the Study

The analysis indicated a definite and quantifiable correlation between starting teacher salaries, student academic performance, and graduation rates among the school districts in the study region of southeastern Pennsylvania. Regarding teacher compensation, the starting salary was positively connected with the number of graduates and standardized test proficiency. Specifically, Pearson correlation analysis revealed a significant positive association between starting teacher salaries and cohort graduation rates ($r = .263$) and an even stronger relationship with PSSA ELA proficiency scores ($r = .386$). While the regression coefficient for starting salary in the multivariate model was modest ($p = .116$), the consistent trends observed in the correlation matrix and scatter plot matrices indicated that the association remains positive, suggesting that while salary is a factor, its influence may be mediated by broader academic mastery.

Consequently, standardized test scores played the most significant role as factors contributing to graduation rates, specifically Keystone Literature and PSSA ELA scores. The regression results indicated that these variables had significant positive coefficients ($p < .001$), strongly affirming that greater academic proficiency directly correlates with better student completion rates. Conversely, the Adjusted Act 1 Index, a reflection of fiscal pressure in school districts, was negatively correlated to standardized test performance and graduation rates. The analysis showed that districts classified as "Economically Disadvantaged" (those possessing an Adjusted Act 1 Index $> 2.4\%$) consistently demonstrated lower academic performance compared to "Wealthy" districts operating under the Base Index, highlighting the critical importance of the socioeconomic context as a determinant of academic performance. Finally, the data set was heavily skewed toward suburban districts (87.0%), with rural, city, and town districts underrepresented. This disparity implies that the region's overall high performance is heavily influenced by the suburban context, where districts often enjoy better infrastructure and funding.

Discussion

The Economic Divide: Wealthy vs. Economically Disadvantaged Districts

A central finding of this study is the stark contrast between districts classified as Wealthy versus those classified as Economically Disadvantaged. Grounded in Human Capital Theory, the premise was that higher investment in teacher salaries would yield better outcomes. The data supports this, but with a caveat regarding district wealth. Wealthy districts (Base Index) generally offered higher starting salaries, such as District 92 at \$56,128, and achieved higher graduation rates (District 92 & District 92 Education Alliance, 2016). In contrast, Economically Disadvantaged districts (Adjusted Index), like District 13 with a starting salary of \$41,000, faced the dual burden of lower compensation capabilities and higher student needs (District 13 & District 13 Education Association, 2016). The strong negative correlation between the Adjusted Act 1 Index and academic outcomes ($r = -.682$ for graduation rates) confirms that financial stress is a potent inhibitor of student success.

Rationale for the Pre-Pandemic Timeframe

The findings of this study must be interpreted within the specific temporal context of the 2016-2017 through 2018-2019 academic years. This timeframe was intentionally selected to establish a stable baseline of performance prior to the onset of the COVID-19 pandemic. The pandemic caused unprecedented disruptions, including the suspension of standardized testing in 2020, widespread learning loss, and the temporary infusion of Federal relief funds (ESSER) that may have artificially inflated district budgets. By utilizing a pre-pandemic window, this study successfully isolated the structural relationship between teacher compensation and student outcomes without the confounding "noise" of emergency remote instruction and health-related absenteeism. However, this also implies that the current post-pandemic educational landscape may present new variables not captured in this specific data set.

Implications

The purpose of this quantitative study was to investigate the relationship between teachers' beginning salaries and student academic performance within 92 public school districts in southeastern Pennsylvania, grounded in Human Capital Theory. The interpretation of the findings presents several critical implications when organized around the study's research questions and hypotheses.

Regarding RQ1 and the corresponding hypothesis, H1₀, the findings demonstrated a statistically significant positive correlation between higher starting teacher salaries and improved student academic performance, specifically in graduation rates and PSSA ELA and Keystone Literature proficiency scores. This conclusion supports the premise of Human Capital Theory, which theorizes that financial investments in entry-level educator compensation enhance professional productivity and educational outcomes. The results are consistent with the literature established in Chapter 2, notably García and Han (2022), who found that competitive base salaries attract and retain effective educators, thereby directly improving standardized test scores.

Addressing RQ2 and RQ3 alongside their respective hypotheses, H2₀ and H3₀, the analysis explored relationship variables and how financial constraints affect these educational outcomes. The data revealed a strong, statistically significant negative relationship between district financial constraints, measured by the Adjusted Act 1 Index, and student academic performance. Districts classified as "Economically Disadvantaged" (possessing higher Adjusted Act 1 Indices) consistently exhibited lower graduation rates and standardized test scores compared to "Wealthy" districts operating under the Base Index. This supports H2₀ and H3₀, confirming that the relationship between minimum salary and student outcomes is heavily influenced by a district's financial health. These results align with Lapp and Shaw-Amoah (2023), emphasizing that Pennsylvania's heavy reliance on local property taxes intensifies educational inequities, leaving underfunded districts struggling to remain competitive in teacher recruitment.

Limitations

Although the study generated crucial information about a correlation between teacher starting salaries and student academic performance, it did not come without limitations. First, the sample was strongly skewed toward suburban districts, which comprised 87.0% of the total. This overrepresentation could have created a bias in the outcomes because suburban districts typically enjoy more funding, better infrastructure, and pay teachers higher than urban school districts, all of which relate to student academic performance. Therefore, the results might not accurately represent the distinct challenges encountered in underrepresented rural or urban districts across the Commonwealth. Second, the study was limited to the school districts in southeastern Pennsylvania so the generalization of the results would be limited. Other school systems with different demographic, financial or policy contexts might not show the same tendency in the conducted research.

Third, some data fields solicited via Right-to-Know requests, especially starting salaries, contained missing or incomplete entries. This necessitated data cleaning and preparation prior to import into JASP. A temporal limitation also exists, as the data was exclusively pre-pandemic. While this ensures internal validity, it does not account for the post-2020 shifts in the teacher labor market or student learning behaviors. Finally, the quantitative model only considered measurable factors including teacher salaries, standardized test results, and graduation rates. Qualitative variables such as school leadership quality, teacher experience, parental involvement, and classroom conditions were omitted due to data constraints in this study. The latter are factors that have been shown to dramatically influence student performance and should be included in further educational research as part of a more holistic view of educational outcomes (Karakose et al., 2024).

13. Recommendations

For Practice

The evidence from this study suggests that addressing educational inequities requires comprehensive policy reforms and specific action planning at the district level. Based on the findings linking high Adjusted Act 1 Indices

with lower academic performance, it is evident that the current reliance on local property taxes perpetuates inequality. Consequently, as a primary action step, policymakers should re-evaluate how educational funding is distributed among districts in southeastern Pennsylvania, a change that could ultimately affect all districts in the State. Funding models must be reformed to allow for a better distribution of resources, ensuring that underfunded rural and urban districts can offer competitive starting salaries without overburdening local taxpayers (Dhaliwal & Bruno, 2021).

Furthermore, school districts reporting lower educational performance should consider the strategic role of starting teacher salaries in their action planning. Since the findings indicated a positive connection between pay levels and student outcomes, strategically increasing entry-level compensation is a viable, evidence-based method for recruiting high-quality educators who might otherwise migrate to wealthier suburban districts. Finally, district academic performance monitoring should extend beyond traditional graduation rates to include standardized assessment patterns and financial health indicators. Incorporating the Act 1 Index directly into district-level strategic planning would allow administrators to design interventions carefully tailored to their specific economic realities.

For Future Research

Based on the theoretical framework, findings, and implications of this study, several avenues for future research are recommended to build upon this foundational knowledge and improve upon the study's limitations. First, to address the temporal limitation of using pre-pandemic data, the next logical step in this line of research is to replicate this study using a new three-year range occurring after the stabilization of the COVID-19 pandemic (e.g., 2023-2026). This more recent longitudinal approach is critical to determining whether the correlations between teacher salary and student academic performance have shifted or remained consistent in the context of widespread learning loss and the exacerbation of the teacher shortage. It is imperative that such a study utilizes data free of pandemic-era anomalies, such as optional testing years or temporary Federal relief funding, to ensure an accurate comparison against the pre-pandemic baseline established in this research.

To improve upon geographic and sampling limitations, subsequent research should extend geographical boundaries beyond southeastern Pennsylvania to investigate whether correlations between teacher starting salary, fiscal pressure, and student academic performance hold elsewhere, notably in other parts of the state (Marchand & Weber, 2019). Future studies must purposefully strive to provide a more balanced sample of rural-, urban-, and town-based districts to mitigate the suburban skew observed in this data set. This heterogeneous sampling will enable wider generalization and assist in pinpointing regional variances that affect educational equity. Longitudinal studies will also be essential to monitor the long-term sustainability and efficiency of teacher compensation strategies, school district funding reforms, and academic policy shifts in boosting student graduation rates (Nguyen et al., 2023).

Additionally, future studies should specifically isolate "Economically Disadvantaged" districts to conduct a focused analysis of high-performing outliers, districts that achieve high student success despite possessing high Adjusted Act 1 Indices. This targeted investigation should aim to identify effective non-monetary strategies and examine the role of multi-level governance, evaluating how strengthened synergies between school administrations, government bodies, and community stakeholders contribute to long-term improvements in learning quality (Penuel et al., 2020).

Finally, to address the unexplained variance ($R^2 = .626$) observed in the regression model, future researchers should adopt mixed-methods research designs. Incorporating qualitative variables such as teacher experience, leadership effectiveness, classroom learning environments, and parental involvement would capture the "lived experience" of teachers in underfunded districts, contributing to a more comprehensive understanding of the factors governing student academic performance (Pregoner, 2024). Finally, the application of advanced analytics and machine learning models in future studies could help uncover non-linear and complex interactions between financial, social, and academic indicators. These techniques could significantly improve predictive accuracy and offer more actionable insights for policymakers, district administrators, advocacy groups, and legislators in the state of Pennsylvania.

14. Conclusions

This quantitative study investigated the issue of educational inequity in southeastern Pennsylvania, specifically focusing on how reliance on local property taxes has created significant disparities in teacher starting salaries. The researcher explored how these financial gaps may ultimately affect student academic outcomes. By analyzing data from 92 public school districts across the 2016-2017, 2017-2018, and 2018-2019 academic years, this research investigated the extent to which investment in teachers' starting salaries correlates with measurable academic success, including graduation rates and standardized test proficiency. The importance of this inquiry lies in its potential to inform evidence-based policy reforms that move beyond simple salary adjustments to address the structural economic conditions that define a district's ability to attract and retain high-quality educators.

The fundamental lesson emerging from this data was that while financial investment in human capital is a critical driver of student academic success, it cannot be viewed in isolation from the broader fiscal health of the school district, specifically in Pennsylvania. The findings confirmed a statistically significant, positive association between higher starting teacher salaries and improved student graduation rates and English language arts proficiency. However, the multivariate analysis revealed that this relationship is deeply intertwined with district wealth. The strong inverse relationship between the Adjusted Act 1 Index and academic performance demonstrates that financial distress is a critical inhibitor of student educational achievement, often preventing economically disadvantaged districts from competing for the talent necessary to close the achievement gap.

With respect to previous research and practice, these results of this study validate Human Capital Theory within the specific context of Pennsylvania's funding landscape, confirming that higher compensation is an effective mechanism for enhancing productivity and outcomes. However, the study highlights the notion that the effectiveness of starting salary as a device for improvement of academic performance is constrained by the district's tax base. In current practice and policy, this implies that simply mandating higher starting salaries without accompanying systemic funding reform may be insufficient for the State's most vulnerable districts. In conclusion, the critical insight from this study is that educational equity depends on a dual commitment: first, to strategically raise starting teacher compensation as a recruitment tool, and second, to overhaul State funding formulas to ensure that local economic disadvantage does not become the sole determinant of student academic success.

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Appendices

Appendix A. IRB Approved Exempt



APPROVED EXEMPT/088-24-IRB/DelGuerico, Nicole L./The Effect of Teachers' Starting Salary on the Academic Performance of Students in the State of Pennsylvania

From Christiansen, Gail Christiansen.G@mercyu.edu <Christiansen.G@mercyu.edu>

Date Fri 12/20/2024 9:57 AM

To DelGuerico, Nicole <delguerico.n@mercyu.edu>; O'Brien, Joseph <OBrien.Joseph@mercyu.edu>

Cc IRB@mercyu.edu <IRB@mercyu.edu>

1 attachment (126 KB)

Review 002 for 088-24-IRB DelGuerico.pdf

Dear Ms. DelGuerico:

On behalf of the Gwynedd Mercy University Institutional Review Board, I am pleased to inform you that the Board has reviewed your research proposal and has determined that the proposal, as submitted, is APPROVED EXEMPT.

This approval is for a period of one year from the date of this letter and will require a formal submission for re-approval with the IRB along with a progress report should it extend beyond the one year timeline.

The IRB shall have authority to suspend or terminate approval of research that is not being conducted in accordance with the IRB's requirements or that has been associated with unexpected serious harm to subjects. Any suspension or termination of approval will be determined by the committee as a whole, shall include a statement of the reasons for the IRB's action and shall be reported promptly to the principal investigator and appropriate institutional officials. Should any changes need to be made to the protocol during the period of approval, you must submit a revised protocol using form IRB-007 to the IRB for approval before implementing the changes. Should any problems or adverse events occur during the research, these must be reported to the IRB in a written report in accordance with IRB guidelines.

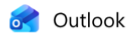
For all "EXPEDITED" or "FULL" reviews, the principal investigator must inform the IRB in writing when the research project has been completed through the submission of a study completion form (IRB Form 011) with a summary of the research and records and copies of manuscripts or abstracts resulting from the approved research.

We appreciate your adherence to the standards designed to protect the rights of human subjects utilized in research studies and wish you luck in your proposed research. If you have any questions regarding the IRB's decision or any part of the IRB process through the completion of your study, please contact the IRB Administrator.

Sincerely,

Gail E. Christiansen.
IRB Coordinator
Gwynedd Mercy University
christiansen.g@mercyu.edu

Appendix B. IRB Request for Time Extension Approved



IRB007 REQUEST FOR TIME EXTENSION APPROVED/088-24-IRB/DelGuerico, Nicole L./The Effect of Teachers' Starting Salary on the Academic Performance of Students in the State of Pennsylvania

From Christiansen, Gail Christiansen.G@gmercyu.edu <Christiansen.G@gmercyu.edu>

Date Fri 12/19/2025 10:14 AM

To DelGuerico, Nicole <delguerico.n@gmercyu.edu>; O'Brien, Joseph <OBrien.Joseph@gmercyu.edu>

Cc IRB@gmercyu.edu <IRB@gmercyu.edu>

Dear Ms. DelGuerico:

On behalf of the Gwynedd Mercy University Institutional Review Board, I am pleased to inform you that the Board has reviewed your Form IRB007 and has determined that the request for a time extension is APPROVED.

This approval is for a period of one year from the date of this letter and will require a formal submission for re-approval with the IRB along with a progress report should it extend beyond the one year timeline.

The IRB shall have authority to suspend or terminate approval of research that is not being conducted in accordance with the IRB's requirements or that has been associated with unexpected serious harm to subjects. Any suspension or termination of approval will be determined by the committee as a whole, shall include a statement of the reasons for the IRB's action and shall be reported promptly to the principal investigator and appropriate institutional officials. Should any changes need to be made to the protocol during the period of approval, you must submit a revised protocol using form IRB-007 to the IRB for approval before implementing the changes. Should any problems or adverse events occur during the research, these must be reported to the IRB in a written report in accordance with IRB guidelines.


For all "EXPEDITED" or "FULL" reviews, the principal investigator must inform the IRB in writing when the research project has been completed through the submission of a study completion form (IRB Form 011) with a summary of the research and records and copies of manuscripts or abstracts resulting from the approved research.

We appreciate your adherence to the standards designed to protect the rights of human subjects utilized in research studies and wish you luck in your proposed research. If you have any questions regarding the IRB's decision or any part of the IRB process through the completion of your study, please contact the IRB Administrator.

Sincerely,

Gail E. Christiansen.
IRB Coordinator
Gwynedd Mercy University
christiansen.g@gmercyu.edu

Appendix C. Collaborative Institutional Training Initiative (CITI) Transcript



[My Courses](#) [My Records](#) [My CEs](#)

[Nicole DeGuerico](#)
ID 12509465

Support

Records

Gwynedd Mercy University (ID 4002)

Show Records for:

Gwynedd Mercy University Records (ID 4002)

CITI Conflicts of Interest - Conflicts of Interest (ID 182640)

Stage	Record ID	Passing Score	Your Score	Start Date	Completion Date	Expiration Date	Gradebook	Completion Record
Basic Course	57865292	80%	100%	28-Aug-2023	28-Aug-2023	28-Aug-2027	View	View-Print-Share

Social & Behavioral Research - Basic/Refresher - Social & Behavioral Research (ID 182647)

Stage	Record ID	Passing Score	Your Score	Start Date	Completion Date	Expiration Date	Gradebook	Completion Record
Basic Course	57865293	80%	98%	27-Aug-2023	27-Aug-2023	27-Aug-2026	View	View-Print-Share

Information Privacy Security (IPS) - Students and Instructors (ID 182655)

Stage	Record ID	Passing Score	Your Score	Start Date	Completion Date	Expiration Date	Gradebook	Completion Record
Basic Course	57865294	80%	100%	28-Aug-2023	28-Aug-2023	-	View	View-Print-Share

Social and Behavioral Responsible Conduct of Research (ID 182663)

Stage	Record ID	Passing Score	Your Score	Start Date	Completion Date	Expiration Date	Gradebook	Completion Record
RCR	57865295	80%	98%	28-Aug-2023	28-Aug-2023	28-Aug-2026	View	View-Print-Share