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# How Much Is Enough? A Study of Pennsylvania School Performance Profile Scores and School District Expenditures

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# HOW MUCH IS ENOUGH?

# A STUDY OF PENNSYLVANIA SCHOOL PERFORMANCE PROFILE SCORES AND SCHOOL DISTRICT EXPENDITURES

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The public school system in Pennsylvania has experienced academic and financial challenges over the past 10 years. In June 2006, the state government passed the Taxpayer Relief Act, also referred to as Act 1. The Act was later revised in 2011 and limits the ability of school districts to increase taxes beyond a set limit without voter approval (Pennsylvania Department of Education, 2018). Given Act 1, the problem for school district stakeholders is to know how much money is enough to adequately educate students to meet the expected level of achievement on the Pennsylvania School Performance Profile (SPP) website.

The purpose of this study was to analyze data from Pennsylvania school districts and determine if the dollar amount spent in specific areas influenced SPP scores. In this quantitative study, archival information was retrieved, reviewed, and compared against other public schools in Pennsylvania.

The researcher reviewed the SPP scores of schools in three categories: small schools (with student enrollment of fewer than 1,500 students), medium schools (with enrollment from 1,500 through 4,999 students), and large schools (with enrollments of 5,000 or more students). Specifically, the researcher examined the amount of spending per student in each district. In addition, the cost per student was compared against the average SPP scores of schools with scores in the following ranges: 0–69, 70–79, and 80

and above, respectively. Furthermore, the researcher analyzed and categorized additional variables, including each school's special education percentage and the percentage of students qualifying for free and reduced-price lunch (students who are considered to be economically disadvanataged).

This study began with five null hypotheses. The null hypothesis for question #1, There is no relationship between per pupil expenditures in instruction and SPP scores, is rejected. Given the data and research conducted on instructional expenditures in regular education (accounting code 1100), special education (accounting code 1200), and vocational education (accounting 1300), significant relationships were identified. Small and medium school districts that spend more money on special education (1200) are more likely to have lower SPP scores. In addition, medium schools that spend more per student in regular education (1100) are more likely to have higher SPP scores. Lastly, large school districts that spend more money on vocational education (1300) expenditures are more likely to have lower Weighted SPP scores.

Null Hypothesis 2, There is no relationship between per pupil expenditures in support services and SPP scores, is rejected. Given the data and research conducted on student support services (accounting code 2100), staff support services (accounting code 2200), and administration of support services (accounting 2300), the per student expenditures had significant correlations and predictability on weighted SPP scores. Medium-sized schools that spend more money in student support services (2100) are more likely to have higher SPP scores.

Null Hypothesis 3, There is no relationship between per pupil expenditures and federal dollars received by the district and SPP scores, is rejected. Given the data and

research conducted on per pupil federal expenditures, significant relationships were found. Overall, schools that spend more on per pupil federal expenditures are more likely to have lower SPP Scores.

Null Hypothesis 4, There is no relationship between per pupil expenditures and federal dollars received by the district and SPP scores, is rejected. Given the data and research conducted on per pupil federal expenditures, significant relationships were found. Overall, schools that spend higher amounts on per pupil federal expenditures are more likely to have lower SPP Scores.

Null Hypothesis 5, There is no relationship between an SPP score and other factors, is rejected. Given the data and research conducted on special education, economically disadvantaged, and students who are English Language Learners, as well as regular education significant correlations were found.

# DEDICATION

To My Daughters: Janae and Sophia. Both of you have grown up so much since I began this final degree nearly five years ago. I love both of you more than words can express, and I pray each of you has the courage to follow the plan God has in store for you. Never stop dreaming and reaching for the stars.

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# CHAPTER ONE

# THE PROBLEM

## Introduction

The public school system in Pennsylvania has experienced academic and financial challenges over the past 10 years. In June 2006, the state government passed the Taxpayer Relief Act, also referred to as Act 1. The Act was later revised in 2011 (Pennsylvania Department of Education, 2018). One of the more significant sections of the law related to taxes. Prior to Act 1, school directors and superintendents had greater freedom to levy taxes on school district taxpayers. Act 1 provided a formula that is calculated annually for each school district and determines the amount of taxes that a school board can levy on a district (Pennsylvania Department of Education, 2018). For example, if a school board and superintendent need to propose a tax increase that is greater than the allowable rate determined by the index, they now have to seek voter approval through a referendum process. Subsection 331.2 of the law provides specific guidelines associated with how the questions will appear on the ballot (Pennsylvania Department of Education, 2018). So, if school directors want to raise taxes, they do not have the sole ability to do so: The constituents of the school district have to vote and agree to the increase.

In addition to the stress placed on schools by Act 1, Pennsylvania schools experienced a decline in revenue due the economic recession. Beginning in 2007 and for the next several years that followed, the national and state economies experienced a great amount of stress (U.S. Bureau of Labor Statistics, n.d.). When the recession began, the national unemployment rate was 5.0 percent; by 2009, the rate had climbed to 9.5

percent. The economy had not experienced a recession close to the size of the 2007-2009 recession since the early 1980s (Goodman & Mance, 2011). Prior to the recession, states were averaging approximately 1.6 percent growth each year, while in 2009, states cut spending by 3.8 percent and by 5.7 percent in 2010. Nationally, states not only cut spending but also cut jobs: 681,000 jobs were eliminated after 2008, and many local, state, and federal employees who were able to keep their jobs experienced pay freezes and salary cuts (Grovum, 2014). During this time, states and school districts were not only experiencing increased pressure to meet No Child Left Behind (NCLB) performance standards but were also facing financial shortfalls in local and state revenues.

Act 82 of 2012 created a wave of changes in the Pennsylvania public education system. The main focus of the update to the 1949 public school code was to increase accountability. Act 82 provided new standards for evaluating superintendents, educators, and schools by way of a new measure for educators, which became the School Performance Profile (SPP) website. The changes also included additional components to educator evaluations. Prior to Act 82, educators were assessed solely based on observations and walkthroughs by an administrator. As a result of Act 82, observations comprised only 50 percent of educators' evaluations. The additional 50 percent of the teacher evaluation would now be comprised of multiple measures that focused on student performance on state assessments. Observing a teacher and reviewing student performance resulted in a major shift in accountability for evaluating teachers and administrators.

In 2013, the Pennsylvania Department of Education (PDE) applied for a waiver through the U.S. Department of Education (DOE), stating that an accountability tool

would be created to provide an avenue to house and disperse information related to student performance. The SPP website provides a common tool with vast amounts of information for the general public to compare the student performance and demographics of one school to another, using the same format for districts throughout the state. In addition, the SPP website met the waiver requirements of the DOE and provided the data needed for teacher evaluations in order to build performance measures in Pennsylvania.

Since the passing of Act 1 in 2006, school districts have been challenged to meet the expectations of federal initiatives, such as NCLB and, more recently, the Every Student Succeeds Act (ESSA). As Pennsylvania legislators were placing limits on the ability of school board directors to raise taxes, the economy experienced a recession, which added to the challenge of conserving and/or eliminating expenses. This challenge carried over into school districts, which were left to improve performance with, at best, level funding, if not less funding. Finally, schools also experienced the SPP website initiative, which made the performance of each school public.

## Statement of the Problem

The problem for school district stakeholders is to know how much money is enough to adequately educate students to meet the expected level of achievement on the Pennsylvania SPP website. Superintendents, school personnel, school board directors, and the community have the ability to compare their schools' SPP scores to those of other districts. Pennsylvania has provided benchmark-level scores that indicate whether a school is achieving expected levels of performance according to the assessment measures set forth by the PDE. Each school district is measured through the same assessment

measures provided on the SPP website, but each school district must independently create and manage its own spending and budgeting processes.

## Purpose of the Study

The purpose of this study is to analyze data from across Pennsylvania schools and determine if the dollar amount spent in specific areas influenced SPP scores. In this quantitative study, archival information were retrieved, reviewed, and compared against other public schools in Pennsylvania. All data were retrieved directly from the PDE annual financial report (AFR) databases and the SPP website data files.

Similar studies have been done in which student achievement has been compared against the wealth of the district and/or the parents. For example, Malone (2000) performed a quantitative study using data from 1997 through 1998 in the Texas educational system. The author reviewed the amount of money districts had in their general funds and fund balances. Those financial data were compared to student performance in the districts. As a result of the study, the author came to one of several conclusions: The districts with the higher percentage of fund balance as compared to their general fund had the highest student performance, and the higher the percentage of the general fund that was spent on instruction, the higher student achievement was as a result. Stringfellow (2007) reviewed data from schools in Rhode Island and found that as the wealth of the district increased, so did the achievement of the students on the statewide New Standards Reference Examination. Heier (2011) found in Texas during the 2008-2009 school year that a correlation existed between Title I schools and non–Title I schools. To receive Title I funds, a school must meet several criteria, one of which is that 40 percent or more of the population of students must be considered economically

disadvantaged (PDE, 2015c). Heier found that students who attended non–Title I schools scored higher on the math and reading Texas Assessment of Knowledge and Skills (TAKS) tests. Baker (2015) performed a quantitative study and focused on local fiscal capacity and student performance in Virginia schools during the 2009-2010 school year. The study found a relationship between student performance and household income. Sable (2015) performed a mixed methods study in Pennsylvania in which he reviewed both economic and noneconomic indicators of student success in all of the 500 public school districts. The data showed that the best predictor of student achievement was the socioeconomic disadvantage rate as determined by the market value and person income indicator (MV/PI) which is representative of student wealth. The lower the disadvantage level, the higher the student performance.

Given the review of data files from the SPP website, which include specific information about each school, and the approved AFR submitted to the PDE by each school district each fiscal year, relationships between variables can be studied. The data were evaluated in such a way as to provide per pupil costs associated with benchmark SPP scores. Through modeling and correlational analysis, schools can begin to understand the overall relationships between school district spending and resulting SPP scores. In the end, school districts will have a blueprint that will provide examples of how much money is enough to achieve a desired SPP score.

## Theoretical Framework

Production function theory is a relatively simple concept in which inputs into a system are measured against the resulting outputs or outcomes. Put another way, "production function is a mathematical representation of the various technological recipes

from which a firm can choose to configure its production process" (Besanko & Braeutigam, 2005, p. 185). Helmy (1981) described production theory as "any entity using economic inputs such as land, labor, materials, capital and managerial ability to produce outputs of goods and services" (p. 13). Ryan (2012) described production function theory as trying to find the most efficient way to produce goods. He also discussed the idea of how the manipulation of inputs affects the output of the products in the system.

When discussing production theory, it is helpful to understand additional terms and definitions. Besanko and Braeutigam (2005), in their book *Microeconomics*, provide concepts and terms that are associated with production function theories. Besanko and Braeutigam identified the mathematical equation for a simple production function as $Q = f(L, K)$, "where $Q$ is the quantity of the output, $L$ is the quantity of labor used, and $K$ is the quantity of capital used" (p. 185). The equation not only provides the effect of labor and capital on the output but can also be manipulated to identify terms, such as the labor requirements function, which can be represented as $L = g(Q)$. This equation can identify the relationship or amount of labor needed to provide a certain output.

Finally, the theoretical perspective acknowledges that schools in Pennsylvania cannot operate without resources. School resources involve non-instructional and support costs along with direct instructional costs and expenditures. The research questions of this study are aimed at finding a correlation between benchmark SPP scores and average per pupil expenditures of schools that reach the corresponding benchmark scores.

## Significance of the Study

This study is significant because it provides several audiences with crucial information about school spending and student achievement. First, school directors will gain additional information about their district and other districts that are comparable in size, enrollment, wealth, and other factors. Through the SPP website, data have been made easily accessbile to anyone with Internet access. The general public can identify each public school district and then locate the performance score of each building within the district. Once stakeholders understand the financial data associated with SPP scores across the state of Pennsylvania, they can use this information to reflect upon their own school data and make improvements to their SPP scores. Understanding how much money is enough to have schools earn PDE acceptable scores will be invaluable to the schools that have underperformed and will validate the initiatives and financial planning of schools that have acceptable student performance and SPP scores.

School directors are in need of information that can help aid in the decision of how much money is enough to educate students, considering that school directors are facing exponential increases to their budgets, where many of the costs are out of their control. For example, the retirement rates alone of school employees have increased from 7.5 percent in 2011 to 34 percent in the 2017–2018 school year. Given Act 1, the recession in 2009, and limited funding from the state legislature, schools are trying to ensure that they are not spending money unwisely and/or in areas that do not affect student achivement.

Not only will school directors gain knowledge from this information but legislators will gain knowlegdge in the area of student spending and student performance.

State legislation through approval of a state budget will have a direct impact on the amount of subsidy a school district may receive. Understanding the impacts of funding on SPP scores has the potential to help with state funding for school districts. Finally, state legislators will have the ability to view how much funding it takes for school districts to achieve adequate scores on the SPP website. The SPP website was created out of Act 82 of 2012, and the parameters and definitions of what schools should be achieving are part of the website. Having the ability to place a price on the expenditures a school needs to have in order to achieve at the desired levels will be critical in understanding the relationships between school funding and student performance.

## Research Design

To complete this study, the researcher correlated achievement and financial data, which allowed the researcher to compare per pupil expenditures to student performance and determine if there is a significant statistical relationship between the two. For example, the researcher reviewed the SPP scores of schools with student enrollment of fewer than 1,500 students, 1,500 through 4,999 students, and 5,000 or more students. Specifically, the researcher examined the amount of spending per student in each district. In addition, the cost per student was compared against the average SPP scores of schools that have SPP scores in the following ranges: 0–69, 70–79, and 80 and above, respectively. Furthermore, the researcher analyzed and categorized additional variables, including each school's special education percentage and the percentage of students qualifying for free and reduced-price lunch. In the end, the researcher created a production function model to associate costs to any correlated variable.

## Research Questions

This study began with several questions, all of which. focused upon the current per pupil expenditures in Pennsylvania along with the accompanying test scores for each school district. The following questions are the focus of the study:

1. Is there a relationship between per pupil expenditures in instruction and SPP scores?
2. Is there a relationship between per pupil expenditures in support services and SPP scores?
3. Is there a relationship between total per pupil expenditures and SPP scores?
4. Is there a relationship between the amount of federal dollars a school district receives and SPP scores?
5. Do other factors that are not financial in nature influence SPP scores?
    a. Special Education Population
    b. Economically Disadvantaged Population
    c. English Language Learners

## Hypotheses

As a quantitative study, the following null hypotheses are designed to answer the guiding questions for any relationships:

Null Hypothesis 1: There is no relationship between per pupil expenditures in instruction and SPP scores.

Null Hypothesis 2: There is no relationship between per pupil expenditures in support services and SPP scores.

Null Hypothesis 3: There is no relationship between total per pupil expenditures and SPP scores.

Null Hypothesis 4: There is no relationship between per pupil expenditures and federal dollars received by the district and SPP scores.

Null Hypothesis 5: There is no relationship between an SPP score and other factors.

## Assumptions and Limitations

This study has several assumptions. First, the SPP website is a collection of student performance data for all 499 public school districts in Pennsylvania. In addition, all public schools are subject to the Office of Open Records (OOR) Right to Know law, which provides guidelines for school districts to follow in releasing information (Pennsylvania Office of Administration, 2008). Therefore, it is assumed that the researcher, through access to the SPP website and through the availability of financial data via the PDE website, was able to perform calculations from all public school districts within the commonwealth. Next, it is assumed that the data entered by each district administrator are correct and that all school districts are reporting all the information in the same template form. Given the number of Pennsylvania Information Management System (PIMS) reports in a school year and the amount of cross-referencing PDE does, the assumption is that the data are reliable. Most school districts utilize some type of information management software, which allows the information to be reported directly to the PDE PIMS reporting website.

Next, school districts are required to certify to the PDE that the board of directors has approved a yearly budget. Furthermore, a copy of the budget, known as a PDE 2028

form, is submitted to the PDE (2016a). In addition, not only is the budget submitted to the PDE prior to July 1 each year but each school is required to have its financial information audited each year. After a local audit is completed each fall, an annual financial report is created and forwarded to the PDE. It is assumed that the Annual Financial Report (AFR) submitted to the PDE is accurate, because a third-party auditor has reviewed the financial information.

## Limitations

Limitations of the study follow:

1. The study only included historical data from the PDE.
2. Research was limited to public schools and excluded private, charter, and cyber charter schools.
3. The researcher did not consider class sizes within the study.
4. The researcher did not consider the family structure in which the students reside (i.e. Two parent, single parent, grand parent, guardian status).
5. The researcher did not consider teacher certification, tenure or degree status.
6. The researcher did not conduct interviews, conversations, or clarifying questions for the study.
7. The researcher did not take into account the attitudes, cultures, and beliefs of the stakeholders or how they measure student success.

## Definition of Terms

Definitions of key terms used in the study follow:

*Keystone Exams.* "The Keystone Exams are end-of-course assessments designed to assess proficiency in three subjects: Algebra I, Literature and Biology…" (PDE, 2013, p. 26).

*No Child Left Behind (NCLB).* "The purpose of this title is to ensure that all children have a fair, equal, and significant opportunity to obtain a high-quality education and reach, at a minimum, proficiency on challenging State academic achievement standards and state academic assessments" (U.S. Department of Education [DOE], n.d., para. 2).

*Pennsylvania Accounting Code 1100.* Represents regular elementary and secondary K-12 program instructional costs, which can also include early intervening services (Pa Office of the Budget, 2018).

*Pennsylvania Accounting Code 1200.* Represents special programs designed to support students with special needs, and includes life skills, sensory support, emotional support, gifted, and early intervention support costs (Pa Office of the Budget, 2018).

*Pennsylvania Accounting Code 1300.* The per pupil 1300 variable represents only the vocational education programs instructional costs (Pa Office of the Budget, 2018).

*Pennsylvania Accounting Code 2100.* Represents only the pupil personnel support costs that focus on the supervision of student services, guidance services, counseling, psychological services, speech services, social work services, and student accounting (Pa Office of the Budget, 2018).

*Pennsylvania Accounting Code 2200.* Represents support services instructional staff, technology support services, computer instruction support services, school library

services, instruction and curriculum development services, and instructional staff development services (Pa Office of the Budget, 2018).

*Pennsylvania Accounting Code 2300.* Represents administration costs, board services, tax collection, legal and accounting services, office of the superintendent, community relations, and office of principal services as reported to PDE each year (Pa Office of the Budget, 2018).

*Pennsylvania Information Management System (PIMS)*. "The Pennsylvania Department of Education's statewide longitudinal data system is improving data capabilities by enhancing school districts' capacities to meet student-level data reporting requirements and provide robust decision support tools. PIMS is based on open internet standards that enable sharing among diverse, otherwise incompatible systems and includes safeguards for data quality and security" (PDE, 2016b, para. 1).

*School Performance Profile (SPP).* "The Pennsylvania School Performance Profile offers a web-based resource for districts/schools to communicate performance results to various constituencies and assist districts and schools in aligning and focusing resources for continuous improvement" (PDE, 2017b, para. 1).

## Expected Findings

Through this study, it was expected that lower per pupil expenditures correlated to lower SPP scores. As per pupil expenditures increased, the SPP scores were expected to increase. The researcher expected to find that a point at which SPP scores no longer increased once the per pupil expenditures reached a certain point. Further, it was expected that, per pupil expenditures would increase without reaping the benefits of increased student performance.

## Summary

School districts have experienced financial limitations since the recession in 2008 and the years that followed as the housing market lagged and more people found themselves unemployed. As schools were making financial adjustments to address the lack of revenue, additional mandates were implemented from the Pennsylvania state legislature. School districts have to meet the budgetary and financial limitations of Act 1. Meanwhile, the creation of the SPP website through Act 82 of 2012 has made the performance of every school building public.

Often the two major concerns of school directors are to deliver a quality education to students, as defined by the PDE, and to be fiscally responsible to the constituents. Research data involving student performance data and fiscal spending provides school directors the opportunity to reflect upon the state averages and to better understand how much money is enough when it comes to ensuring that districts are successful in providing a quality education to their students.

## Organization of the Remainder of the Study

The remainder of this research study is organized into several chapters. Chapter 2 consists of a review of literature focused on per pupil expenditures and student performance. Research studies focusing on per pupil expenditures and student performance exist for other states, including Texas, Missouri, and Rhode Island. Chapter 3 focuses on the methods used to test the research questions and null hypotheses. Chapter 4 will provide examples of how the data were categorized, including sample size and outcomes of the data once the data were placed into tables, such as the Pearson product-moment correlation and regression calculations. Finally, Chapter 5 provides an

opportunity to analyze the data found in Chapter 4 so that the research questions and hypotheses are answered. In the end, the limitations of the study are reviewed, along with the need for further study.

# CHAPTER TWO

# REVIEW OF LITERATURE

## Introduction

The creation of the SPP website increased the ease with which community members can access information about their schools. Parents and community members now have a platform that provides information and data that can be compared against other school districts. School district information, such as student performance on high-stakes tests, attendance, and dropout percentages, are all part of the website data and factor into the calculation of each building score. In addition to the SPP website, the PDE provides annual financial reports (AFR) for each school district. Per student expenditure costs can be calculated by dividing overall expenses from the AFR by the number of students who are enrolled in the district. The goal of the research questions in this study is to review SPP information and school financial information to determine if relationships exist between student performance thresholds (scores) and per pupil expenditures (spending). The purpose of this chapter is to review the history of how schools have been funded in Pennsylvania, the recent economic conditions that have impacted the economy and, specifically, education, recent funding studies, state and national legislation that created the SPP website, and federal nonprofit and employer perceptions of workforce preparedness. Finally, this chapter contains a review of several theories, including production theory, economies of scale, and capital theory, which have been used in prior studies comparing resources in education to outcomes in student performance.

## Historical Perspective

School funding in Pennsylvania has evolved throughout the last 200 years. Beginning in the late 1700s and early 1800s, school-aged residents of Pennsylvania were entitled to free public education. In the early 1800s, the commonwealth was responsible for approximately 20 percent of the funding, while each county was responsible for the remaining 80 percent of the cost to educate Pennsylvania's youth (Bissett & Hillman, 2013). After the Common Law of 1834 was passed, each county in Pennsylvania was responsible for creating a school district. In addition, a funding equation for schools was created and was based on the number of inhabitants in the county. This funding strategy was used from 1834 until 1897. Depending on the number of inhabitants and the wealth, or lack thereof, in the county, some school leaders felt the funding strategy was not equitable (Bissett & Hillman, 2013). Meanwhile, the federal government began collecting information about the progress of student access to public education throughout the United States in the mid- to late 1800s. In 1850, 47 percent of school-aged children ranging in age from 5 to 19 years were enrolled in school. Enrollment numbers increased slightly over the next several decades, and by 1910, 58 percent of school-aged children were enrolled in public school (Snyder & National Center for Education Statistics, 1993).

### The 1900s

At the turn of the twentieth century, Pennsylvania school districts experienced legally mandated fiscal changes, such as a minimum monthly salary of $40 for teachers. Teachers who had earned higher than provisional certification were often paid more as a result of the Woodruff Salary Act of 1919 (Bissett & Hillman, 2013). Throughout the next several decades, the Pennsylvania legislature attempted to provide equitable

solutions to school funding. In 1947, the State Tax Equalization Board (STEB) was created to help provide a more uniform structure for how school district wealth was determined throughout the commonwealth. In addition, the creation of the STEB allowed for increased financial subsidies from the commonwealth, which went from approximately 20 percent in the early 1900s to 40 percent by 1950 (Bissett & Hillman, 2013). In addition to the formation of the STEB, the state legislature consolidated the past educational laws with the Public School Code of 1949 (PSC). This law continues to govern the academic requirements and course offerings of school districts by identifying the minimum breadth of course work a student should experience prior to graduation. The PSC has been amended several times. In 1966, the law was amended to account for new student enrollment calculations, such as ADM and WADM, which continue to affect subsidy calculations today. The new calculations provided an avenue for the state to provide subsidies to school districts (Bissett & Hillman, 2013). At the same time the PSC was amended at the state level, the federal legislature was changing the national landscape of public education. The Elementary and Secondary Education Act of 1965 (ESEA) was signed into law by President Lyndon B. Johnson and allowed for federal funding and grant opportunities to school districts. As a result of the law, the funding was divided into areas, or titles. The titles addressed areas affected by federal activity from helping with the educational needs of low-income families to providing supplementary services and funds for educational research and training. Overall, ESEA enabled school districts to receive funding based on the demographics of students enrolled in the districts.

School districts received increased funding throughout the next several decades. Pennsylvania went from spending $1.7 billion in the 1970s to spending $3.7 billion in 1980. By 1990, Pennsylvania was spending $6.8 billion (Bissett & Hillman, 2013), and by 2017, funding had increased to $13.5 billion (Commonwealth of Pennsylvania, n.d.). Over the course of nearly 50 years, school districts saw the implementation of federal funding through ESEA and later amendments. The Commonwealth of Pennsylvania continually increased school funding at an overall increase of $11.8 billion annually from 1970 to 2017 (Commonwealth of Pennsylvania, n.d.). During this period of increased federal and state funding, government agencies reported on how well students were performing when compared to other counties (Bissett & Hillman, 2013).

**The 2000s**

NCLB was passed in 2002 and, touted as a signal achievement of President George Walker Bush's presidency, was considered a major overhaul to the original ESEA of 1965. As a result of NCLB, each state, including Pennsylvania, was required to create a system to measure both *student* performance and *school* performance. The overall goal of NCLB was for every student in America to be proficient in reading and math by 2014 (PDE, 2016c). As a result, Pennsylvania created the PSSA, a series of student assessments given to students in Grades 3, 5, 8, and 11. In addition, schools had to make adequate yearly progress or face tiered ramifications and labeling, including "warning, school improvement, and corrective action" (PDE, n.d.-a).

In 2009, President Obama introduced his Race to the Top (RTT) initiative through the American Recovery and Reinvestment Act of 2009 (ARRA), with one goal, among many, being to ensure that high school graduates are college and career ready (DOE,

2014). The RTT initiative increased state educational funding through a competitive grant process. One of the main criteria, as outlined in the executive summary, was that states needed to have the ability to link student performance and student growth to teacher evaluations (DOE, 2014). In addition, the RTT initiative had four major themes. First, states needed to adopt college and workplace standards so students could be successful in a global economy. Second, schools needed to begin keeping student growth and success data. Third, schools needed to begin recruiting and retaining effective teachers and principals. Fourth, states needed to demonstrate how they were going to turn around low-performing schools (DOE, 2014). As a result of RTT, schools now need to add the element of career readiness to the expected skill set of graduating students. Because RTT was a voluntary process and the states and districts had to apply for the grant funds, the standards and initiatives from NCLB remained in place.

In 2013, the PDE submitted a waiver from some of the NCLB requirements. Through the waiver process, the PDE asked for flexibility in certain areas of the 10 ESEA requirements and components. One of the core changes was to introduce the SPP website and its role in accountability and continuous improvement (PDE, 2013). This waiver was approved, as it echoed the core tenets of NCLB and RTT (PDE, 2013).

## Act 82 of 2012

Act 82 of 2012 created a wave of changes in Pennsylvania's public education system while still operating under NCLB. The main focus of the update to the 1949 public school code was to increase accountability. Act 82 provided new standards for evaluating superintendents, educators, and schools by way of a new measure, which became the SPP website (Public School Code of 1949). For example, Act 82 identified

key components for superintendent contracts; the contract between the superintendent and the school district was now subject to the Right to Know law. This meant that any member of the public could ask for the details of a school superintendent's contract. Act 82 specified that each superintendent contract had to contain specific information, such as a beginning and an end date of the contract, as the state began to standardize the components of the agreement. Superintendent contracts were now required to provide duties, job descriptions, performance standards/goals, and performance evaluation measures for the goals (Public School Code of 1949). Compensation was addressed, as the contract needed to identify all forms of compensation above and beyond salary. In addition, the agreement also included termination, buyout, and severance language, among other items needed in the contract. The language in Act 82 was representative of legislative attempts to control costs and identify success within education (Public School Code of 1949).

The changes did not stop with the superintendent contracts as the evaluation tool to evaluate teachers also changed. In 2004, the PDE recommended the use of three (426, 427, 428) evaluation forms. Depending on whether the educator was a temporary professional or a professional employee, one of the three tools would be used. The evaluation tools focused on four areas dealing with teachers' actions both inside and outside of the classroom on any given day. The four areas included (a) planning and preparation, (b) classroom environment, (c) instructional delivery, and (d) professionalism (Public School Code of 1949). As a result of Act 82, the four areas comprised only 50 percent of the educators' evaluations, whereas in the past, they accounted for 100 percent. The additional 50 percent of the teacher evaluation now

included multiple measures that focused on student performance. For example, 15 percent of the teacher evaluation is required to include building-level performance data. The building-level data include value-added student statistics such as student performance on assessments, the school promotion rate, and the school attendance rate. For high school educators, this section included Advanced Placement participation and SAT data. The next section, which comprised 15 percent of a teacher's evaluation, now includes data about the specific teacher. Unlike the first 15 percent, which comprised school data, this additional 15 percent focused on the specific teacher's student performance data on standardized high-stakes tests. The final 20 percent of the teacher's evaluation was to include elective data focusing on locally designed assessments of student performance (Public School Code of 1949). Observing and rating teachers, along with reviewing student performance, comprised a major shift in accountability for teachers and administrators.

In 2013, the PDE applied for a waiver through the DOE, stating that an accountability tool would be created to house and disperse information related to student performance. The SPP website met the waiver requirements of the DOE and also provided the data needed for teacher evaluations in Pennsylvania. The SPP website provides a large amount of information of student demographic information, student performance and general schoolwide information. One of the key uses of the website is to identify the rating provided to each building. A building can receive a score between 0 and 100. The calculation used to determine each building score is the same across the state for buildings of the same type (elementary, middle, and secondary). The score is made up of data elements that allow schools to earn points in certain areas. The first data

element is indicators of academic achievement, which comprise 40 percent of the overall score for a building. The main academic areas assessed in this element are mathematics, English language arts, and reading, and the assessment is the PSSA, which was a result of the NCLB initiative in 2001.

The next data element includes indicators of "closing the achievement gap with all students." In this section, schools are able to earn five percent, and the subject areas remain the same. Another section, at five percent is closing the achievement gap of "historically underperforming students." Next, 40 percent can be earned by "indicators of academic growth," which uses the Pennsylvania Value Added Assessment System (PVAAS) to measure student growth in a given school year. A school can earn an additional 10 percent through "other academic indicators," such as promotion and attendance rates. Lastly, a school can earn seven extra credit points toward the overall rating by having students score advanced on PSSA and through Advanced Placement student performance measures.

Act 82 of 2012 provided accountability for superintendents, administrators, teachers, and schools. Educators could no longer be assessed without student performance and attainment data. The main tools that provided the data were student PSSA assessments, PVAAS growth data, and the SPP website.

## Every Student Succeeds Act of 2015

Major overhauls to education by way of legislation has happened several times throughout the last 50 years. President Lyndon B. Johnson authorized the ESEA of 1965 as part of "the war on poverty." Thirty-seven years later, President George W. Bush reauthorized the law with his education initiative, "No Child Left Behind." The latest

revision to President Lyndon B. Johnson's initial education initiative was championed by President Barack H. Obama with the Every Student Succeeds Act, or ESSA. Reauthorized in December 2015, ESSA provides a legislative road map of goals and expectations from the federal level. Broken down into nine titles, or subheadings, the law provides detail regarding the goals of the U.S. educational system at the national level.

ESSA reauthorizes ESEA of 1965 for four more years and continues to provide similar expectations as NCLB. The law is broken down into Titles I-IX. A significant part of the law comprises Title I dollars; schools will continue to receive Title I funds, which will increase from $15,012,317,605 in 2017 to $16,182,344,591 by 2020 (National Conference of State Legislators, 2016). Title I funding provides financial assistance to schools that have a high population and/or percentage of students from low-income families (DOE, 2014). Title I funds are formula driven and fall into four categories: Basic grants are provided to schools where at least two percent of the school-aged population and no fewer than 10 students meet the economic qualifications. Schools that meet the second category receive concentration grants, which are designed to aid schools with at least 6,500 school-aged students or at least 15 percent of the school population qualifying as coming from low-income families. The third category comprises targeted grants that provide additional support to schools that have higher numbers and high percentages of low-income students. The last category includes education finance incentive grants, which are formula driven and are based on the state's effort and ability to provide financial support as determined by per capita wealth or income (DOE, 2014).

ESSA requires states to adopt and submit plans of how they will ensure that students are provided a curriculum driven by "challenging" academic standards and

"high-quality" student assessments. Students are to be taught via standards that will prepare them for higher education. While in school, students are to be rated in no fewer than three levels of achievement in mathematics, reading/language arts, and science. Students are to be assessed each year in mathematics and reading/language arts from Grades 3-8, in addition to being assessed one more time between Grade 9 and Grade 12. Science is required to be assessed once in Grades 3-5, once in Grades 6–9, and once in Grades 10-12 (National Conference of State Legislators, 2016). The bill clearly asserts the requirement for some assessment of "higher order thinking skills and understanding, which may include measures of student growth and may be partially delivered in the form of portfolios, projects or extended performance tasks" (National Conference of State Legislators, 2016, p. 3). In addition, student data must be broken down by school into the following categories: "racial and ethnic groups, students who are economically disadvantaged compared to students who are not economically disadvantaged, children with disabilities as compared to children without disabilities, English proficiency status, gender, and migrant status" (National Conference of State Legislators, 2016, p. 3).

ESSA requires that each state provide a report card, which must be disseminated to the public. In addition, other requirements include that the report card must be

> accessible on-line, and provide a clear and concise description of the state's accountability system, including the long-term goals and measurements of interim progress for all students and subgroups of students, the state's system for meaningfully differentiating all public schools . . . The report card will identify all the indicators, and other factors including the professional qualifications of teachers, per pupil expenditures, National Assessment of Educational Progress

> scores, and also, where available and with the 2017 report card, information about postsecondary attainment. Local Education Agencies (LEAs) will also prepare report cards containing information on student performance on academic assessment. (p. 5)

Title II dollars are broken down into several parts. Part A dollars are designed to provide support for educators. Part B funds center on educator equity. Part C funds focus on strengthening Title II part A investments (ESSA, 2015). Title II dollars are formula driven, but the formula changes throughout the four-year plan. The Title II formula is based on the percentage of each state's total population of 5- to 17-year-olds to that of the total population of 5- to 17-year-olds in all states and the same aged students from families below the poverty line each state compared to the total of all states. The first percentage of Title II funding formula will begin at 35 percent and drop to 20 percent by the end of the four years. The second component of the Title II formula will begin at 65 percent and end higher at 80 percent. Throughout the plan, the emphasis shifts to help states with students who are from low-income households. Even though the formula is based upon the population of 5- to 17-year-olds and those 5- to 17-year-olds who reside in low-income families, Title II funds focus upon providing resources to educators and administrators to ensure students are provided quality educators and education.

Title III funding focuses upon language instruction for English language learners and immigrant students. Similar to Title II funds, Title III funds are formula driven and comprise two percentages. For example, 80 percent of the funding is derived from the individual population of ELLs to that of the total population of all states. The remaining 20 percent of Title III funding is based on each state's population of immigrant children

and youth compared to that of the total population of all students. Title III of ESSA includes several goals:

> (1) to help ensure that English learners, including immigrant children and youth, attain English proficiency and develop high levels of academic achievement in English; (2) to assist all English learners, including immigrant children and youth, to achieve at high levels in academic subjects so that all English learners can meet the same challenging State academic standards that all children are expected to meet; (3) to assist teachers (including preschool teachers), principals and other school leaders (state educational agencies, local educational agencies, and schools, established, implemented, and sustained effective language instruction educational programs designed to assist in teaching English learners, including immigrant children and youth); (4) to assist teachers (including preschool teachers), principals and other school leaders to State educational agencies, and local educational agencies to develop and enhance their capacity to provide effective instructional programs designed to prepare English learners, including immigrant children and youth, to enter all-English instructional setting; and (5) to promote parental, family and community participation in language instruction educational programs for the parents, families, and communities of English learners (ESSA, p. 197).

Title IV, also called 21st Century Schools, in ESSA has several overarching goals. First, the funding is designed to give schools the capacity to provide all students with access to a well-rounded education. Next, Title IV funding is designed to help improve school conditions for student learning. Last, Title IV funds are designed to improve the

use of technology and, thus, to improve the academic achievement and digital literacy of all students (NCSL, 2016). LEAs complete a comprehensive assessment every three years to determine the LEA's ability to provide a well-rounded education, including the LEAs' ability to provide a safe school environment and, lastly, the LEAs ability to provide personalized learning for students through the use of technology (NCSL, 2016). ESSA Title IV dollars provide the opportunity for LEAs to apply for funds to help improve technology and technological infrastructure so students have access to current technology and also to provide blending learning opportunities. ESSA provides grant opportunities for LEAs but also for 21st Century Learning Centers, which allow communities to receive funds to provide opportunities for academic enrichment (NCSL, 2016). Through a competitive grant process, Title IV provides funding for charter schools, early childhood, elementary, and secondary students. This funding allows applicants to open or expand new charter schools, provide technical assistance, and, lastly, "to work with authorized public chartering agencies to improve authorizing quality" (NCSL, 2016, p. 10).

Title V funding through Part B, or the "Rural Education Initiative" (NASSP, 2016, para. 1), allows states to target funding towards rural schools. Schools have the opportunity to apply for funds that allow them to participate in two programs. First, the Small Rural School Achievement Program allows schools in rural, low-populated areas to receive additional funding. The second program, the Rural and Low-Income School Program, allows states to target schools with additional funding to help meet other goals of ESSA (NASSP, 2016). Through ESSA, Title V dollars help rural schools by

> requiring the secretary of education to conduct outreach to rural districts . . . reducing the paperwork and compliance burden, allowing district to seek technical assistance on Title V grant applications . . . Allowing districts to work together or with educational service agencies to submit joint applications for federal funding. (para. 4)

Title VI provides funding for Indian, Native American, and Alaskan Native students. Under section 6102, ESSA explains the purpose of Title VI dollars in meeting the needs of Indian students:

> (1) to meet the unique educational and culturally related academic needs of Indian students, so that such student can meet the challenging State academic standards; (2) to ensure that Indian students gain knowledge and understanding of Native communities, languages, tribal histories, traditions, and cultures; and (3) to ensure that teachers, principals, other school leaders, and other staff who serve Indian students have the ability to provide culturally appropriate and effective instruction and supports to such students (ESSA, p. 246).

In addition to providing language and funding to support Indian students, ESSA provides funding for Native Hawaiian students. Section 6204 of Title VI provides funding "through the coordination of educational and related services and programs available to Native Hawaiians, including those programs that receive funding under this part, the Secretary shall award a grant to the educational council described under subsection (b)" (ESSA, p. 262). As part of section (d), which describes the use of funds, Title VI dollars can be used to fund initiatives of the council by way of providing technical assistance and obtaining data that focus upon the "effectiveness" of the grantee to meet the priorities and

implement the activities of the education council. In addition, funds can be used to assess the following: educational needs, programs, and services available to address the educational needs of Native Hawaiian students and the individual and aggregate impact funds are having on Native Hawaiian students. Finally, Title VI provides funding for Alaskan Native education programs. In section 6303, ESSA acknowledges certain aspects of Alaskan Native students in an attempt to provide additional help to those students. For example, the law acknowledges that "Many Alaska Native children enter and exit school with serious educational disadvantages" (ESSA, p. 266). Furthermore, the educational system in Alaska faces difficulty due to "geographic challenges, historical inequalities . . . for Alaskan Native students in rural, village, and urban settings" (ESSA, p. 266). The law goes on to acknowledge Alaskan Native students and the importance of their culture and heritage by stating,

> The preservation of Alaska Native cultures and languages and the integration of Alaska Native cultures and languages into education, positive identity development for Alaska Native students, and local, place-based, and culture-based programming are critical to the attainment of educational success and the long-term well-being of Alaska Native students (p. 342).

Title VII funding provides "impact aid" to LEAs in certain circumstances. Section 7003 addresses situations in which the federal government may own a significant amount of land on which the LEA would have received income if the land were privately owned. The law goes on to speak to school consolidations and the effect of those consolidations on future Title VII payments. Section 7004 provides funding and instructions for schools designated as heavily impacted local educational agencies on military bases that are

within an LEA boundary. The overarching theme to Title VII funding is for the federal government to provide additional funding to LEAs that are impacted by government ownership of property within the LEAs' boundaries.

Title VIII of ESSA is a general provision section of the law. In this section, guidance is provided in many areas, including for state plans submitted to the federal government. In addition, access to secondary students and secondary student information is described in this section. If institutions of higher education and employers are granted access or provided means to speak with secondary students, then ESEA mandates that military recruiters be provided the same access.

ESSA provides federal funding through multiple titles or funding streams, which impacts education all across the nation. The impact of ESSA in each state may look different because of the structure of the law. As the law is written, it provides guidance to the overarching goals of the federal government, and each state department of education is required to submit a state plan outlining the outcomes and strategies that are going to be funneled down throughout the specific state.

## Pennsylvania Consolidated State Plan

School directors and administration are required to follow state and national initiatives when choosing and creating educational program offerings each year as part of the budgeting process. To be in compliance, schools need to follow the state plan to meet ESSA requirements. As a requirement of ESSA, the PDE submitted a consolidated state plan dated September 18, 2017, to the federal government. Pennsylvania's state plan provides a description of the educational system in Pennsylvania and then addresses Sections 1 through 6; for example, Pennsylvania has 1.7 million students in more than

499 school districts and 14 cyber charter schools, which are supported by 29 intermediate units and 84 career and technical centers (PDE, 2017c).

Section 1 of the Pennsylvania state plan addresses long-term academic achievement goals in the areas of English language arts and mathematics. The main long-term goal is to "reduce, by half, the statewide percentage of non-proficient students on state assessments by the end of the 2029–2030 school year. The timeline will allow academic planning and programming to support a cohort of students across the full span of their public education experience, from kindergarten through 12th grade" (PDE, 2017c, p. 8). Similar to the NCLB deadline to have each student proficient by the year 2014, Pennsylvania's plan is to improve student performance over the course of 13 years, or by 2030, but with a more gradual rate of improvement compared to NCLB. The plan states that 2015 baseline data were used to identify the current levels of performance and the expected levels of performance by the year 2030. In English language arts, the baseline performance was identified at 61.6 percent proficient or advanced. The goal by 2030 is to have 80.8 percent of students achieving at the proficient or advanced level. In mathematics, the baseline level of performance used in the state plan was 43.2 percent, and the state goal by 2030 is to have 71.6 percent of students scoring proficient or advanced in mathematics. Another long-term goal is to improve the graduation rate throughout the state. In this section, a baseline from 2015 of 84.8 percent was used, and the goal for 2030 is 92.4 percent graduating based on a four-year adjusted cohort. In each area of the plan, the goal is to increase the performance not only of all students but also of the subgroups of students who identify as one of the following races: White, African American/Black, Hispanic, Asian (not Hispanic), American Indian or Alaskan Native,

multiracial (not Hispanic), Hawaiian Native/Pacific Islander, or students with disabilities (PDE, 2017c). Just as there is a current and future goal for all students, each subgroup has its own goals to reach by 2030.

Section 2 of the Pennsylvania state plan provided, among other information, the process the state went through to arrive at the final version of the plan. For example, a breakdown of public comment was provided: 31 percent were parents/caregivers, 25 percent were pre-K-12 teachers, 12 percent were pre-K-12 administrators, five percent were school counselors, four percent were community-based organizations, four percent were higher education faculty/administrators, and four percent were from advocacy organizations (PDE, 2017c).

Section 3 of the state plan includes a series of questions focused on advanced mathematics coursework in the middle and high school settings and on languages other than English. In the end, the commonwealth documented the following:

> Pennsylvania provides accommodated assessments in English-Spanish side-by-side for the following: PSSA mathematics for students in grades three through eight; Algebra I Keystone end-of-course exam; PSSA science for students in grades four and eight; and Biology keystone end-of-course exam. (PDE, 2017c, p. 35)

Section 4 of the Pennsylvania plan provides in-depth information about the accountability, support, and improvement for schools. In this section, indicators along with descriptions and measurements are provided. Academic achievement will be measured by percentages of proficient and advanced scores in language arts/literature on PSSA/PASA and Keystone exams. In addition, students will be measured by percentages

of proficient and advanced scores in mathematics on Algebra I on PSSA/PASA and Keystone exams. Academic progress will be measured by the average growth index through the PVAAS, "which seeks to determine whether each group of students gains, maintains, or declines in overall academic performance in Mathematics 4–8/Algebra I, English/Language Arts 4–8/Literature, and/or Science 4 and 8/Biology" (PDE, 2017c, p. 39). Graduation rate data will be measured at both the four- and five-year cohort rates. In the end, Pennsylvania wishes to have the five-year plan used for accountability purposes. The next indicator in the plan addresses progress in achieving English language proficiency, which is measured by a one-time attainment assessment. The goal is, through the ACCESS test, to identify and attain English proficiency in no longer than six years. The school quality or student success indicator is measured by chronic absenteeism. The plan describes chronic absenteeism as being absent more than 10 percent of the time, or 18 days in a school year. The plan makes it clear that the student's or parent's excuses for the absences do not matter, as the student is still missing classroom time. In addition, the plan explains that if a student is absent more than 50 percent of the time for a day, it is counted as a full-day absence. Furthermore, if a student is absent less than 50 percent of the day, it shall not be counted as an absence (PDE, 2017c).

The last school quality or student success indicator is career readiness. The state plan references Chapter 4 of the state education code, which "requires all school districts to teach students in four content areas associated with Pennsylvania's Career Education and Work academic standards: Career Awareness and Preparation, Career Acquisition, Career Retention and Advancement, and Entrepreneurship" (PDE, 2017c, p. 41). In addition, the plan identifies the percentage of students who meet the following criteria:

> 1. The percentage of students who, by the end of grade 5, demonstrate engagement in career awareness and preparation via https://www.pacareerzone.org/ or a locally designed career exploration and preparation program/curriculum. 2. The percentage of students who, by the end of grade 8, create an individualized career plan and participate in career preparation activities. 3. The percentage of students, who by the end of grade 11, implement their individualized career plan through ongoing development of a career portfolio and participation in career preparation activities. (PDE, 2017c, p. 41)

To help meet the indicators described, Section 4 of this state plan ends with commitments to utilize frameworks like the Multi-Tiered Systems of Support and Positive Behavioral Interventions and Support, which provide

> delivery of standards-based instruction and differentiated learning opportunities to meet the needs of all students; aggregation and analysis of multiple data points to support informed decisions regarding curriculum, instruction, and assessment; and implementation of a tiered system of support to differentiate programmatic interventions for all students. (PDE, 2017c, p. 57)

Section 5 of the Pennsylvania state plan describes the decline in the number of qualified individuals deciding to enter the field of education, noting that "since 1996, the number of undergraduate education majors in Pennsylvania has declined by 55 percent, while the number of newly certified teachers (Instructional I) has dropped by 63 percent since 2010" (PDE, 2017c, p. 61). Pennsylvania plans to use Title II Part A funds to help current and future educators at different points in their careers. For example, a current initiative provides "focus on helping principals close achievement gaps in their buildings

and provide emphasis on early learning" (PDE, 2017c, p. 65). Finally, other current initiatives, such as the Pennsylvania Inspired Leadership program, which provides support to administrators within public schools and provides "foundational concepts of school leadership and equity" (PDE, 2017c, p. 68), and the Secretary's Superintendents' Academy, which "…was designed to engage—in both urban and rural areas—face the challenges of poverty" (PDE, 2017c, p. 69), were some of the efforts Pennsylvania lauded as helping meet the need of supporting administrators.

Section 6 of the Pennsylvania state plan addresses how the state will utilize the various title monies to support all students. For example,

> the Department intends to prioritize existing state and federal funding sources, such as Title IV, Part A, Title I, Part A, Title IV, Part B (21st Century Community Learning Centers), and Title IV, Part F funds (Promise Neighborhoods and Full-Service Community School Programs). (PDE, 2017c, p. 79)

The goal of using the title monies was to help students participate in advanced course work, including STEM education and supporting college and career pathways. Pennsylvania also intends to use the title money to help students through "school-based supports and community partnerships" (PDE, 2017c, p. 79). In addition, it intends to "promot[e] successful transitions in Early Childhood through Postsecondary Education" and "promot[e] Positive School Climate and Social-Emotional Learning" (PDE, 2017c, p. 79).

The Pennsylvania State Consolidated plan provides insight into how the PDE plans to meet the overall goals of ESSA. The state plan provided new guidelines for student and school performance but continued to use the indicators created under NCLB

and PA Act 82. Accountability measures via the SPP website and other initiatives will continue to apply to school directors and superintendents.

## Pennsylvania School Finance

Public schools in Pennsylvania receive their funding/revenue from federal, state, and local dollars. Federal dollars are distributed through title monies available through ESSA. In the fiscal year 2017-2018, it is estimated that Pennsylvania will receive approximately $1,144,105,162 in federal aid (DOE, 2017). The major components of the aid include $167 million toward educating the disadvantaged; $3.1 million in impact aid; $686 million in aid toward educating homeless children and youth education, which includes 21st Century Community Learning Centers; and, finally, $140 million toward special education (DOE, 2018).

In addition to federal aid, schools receive state funding. In the 2017-2018 Pennsylvania budget, a total of $11.6 billion was allocated for public education. Divided into 22 categories, some of the main areas of funding to schools included basic education funding at just under $6 billion, funding to help aid in public school employees' retirement at $2.2 billion, and $500 million for state employee Social Security funding. The next highest funding category was in special education, at $1.1 billion. The next four categories included $549 million for pupil transportation; $263 million to fund early intervention; $250 million for ready-to-learn block grants; and finally, $172 million for Pre-K counts. Lastly, school districts are required to submit data each year through PIMS, which forwards various kinds of data about the schools, students, and community to the state educational system. Schools are provided the correct amount or percentage of the total funding through this reporting process.

In June of each year, each school district in Pennsylvania is required to submit a general fund budget. Not only do school districts identify what they plan to receive in federal and state dollars but they also document the amount of local dollars the district is expected to receive. The standardized budget document that every school district must use is the PDE 2028 form. This form provides 14 line items for which school districts can identify the amount of local revenue used. For the 2016-2017 school year, Mifflin County School District (MCSD) submitted a PDE 2028 form in June 2016. Data from the MCSD PDE 2028 showed that the district had a total budget of $73 million. MCSD budgeted to receive $3.8 million federal and $36.4 million from state revenues. The remaining portion of the revenue received totaled $32.6 million from local revenue. The local revenue comprised $22.5 million from local real estate taxes, followed by $6 million in Act 511 proportional taxes and, finally, $2.3 million in tax delinquencies. The remaining categories accounted for approximately $2 million of the total $32 million of local revenue that was received.

Statewide, school districts on average depend on 75 percent of the local revenue to be provided through real estate taxes (Keagy & Piper, 2016). Real estate taxes are based on millage throughout the school district. To define the millage rate within a school district, the total assessed value of the properties is multiplied by 0.001 (Keagy & Piper, 2016). School districts often work with the county assessment office to determine the dollar amounts associated with a mill. Prior to Act 1 of 2006, otherwise known as the Taxpayer Relief Act, school boards had greater freedom in increasing taxes each year. Act 1 has changed the parameters by which school districts are able to increase taxes. In September of each year, the PDE provides school districts with an index level (Keagy &

Piper, 2016). School districts cannot increase real estate taxes higher than the index without putting the increase up to vote among the registered voters within the school district.

**Funding Studies in Pennsylvania**

The early and mid-2000s brought the question of funding and adequacy to the forefront in Pennsylvania. With Act 114 of 2006, the state legislature authorized a costing-out study to examine the adequacy and equity of the subsidies school districts received to meet academic standards (Commonwealth of Pennsylvania State Board of Education Summary of Costing Out Study, 2007). The study was performed with one goal in mind regarding adequacy: to determine the cost to have 100 percent of the students mastering the academic standards by 2014. The summary of the costing-out study provided three methods for how the authors arrived at the adequacy findings. The first method was by the "professional judgment" of the educators for gathering the resources needed to achieve the desired results within the school districts. Next, the authors of the study reviewed what they deemed "successful schools" by reviewing the costs and expenditures made by schools that were on track to have their students meet the standards. Finally, the authors' third method was "evidenced based," in which the costs to implement reforms that lead to increased student achievement were reviewed.

The adequacy findings for the study found that in 2005-2006, the state as a whole should have spent $21.63 billion for each school to be on track to meet the desired standards in place. The actual spending of schools at that time was $4.3 billion less, or $17.25 billion. The study went on to break down the discussion of equity in terms of per student costs. The base cost to educate a student was calculated to be $8,003. If a student

qualified for additional services and resources, additional dollars would be added to the base cost. For example, 30 percent was added for students with disabilities, while 43 percent was added for students who were considered to be living in poverty. A sliding scale of 152 percent for large districts to 232 percent for smaller districts was used to describe the extra funding needed to address English language learners. Similarly, a sliding scale of 20 percent to 66 percent was used for gifted students. The report went on to recognize higher per pupil costs in smaller districts as well as the geographic costs of living differences throughout the state. In the end, 94 percent of districts were not spending an adequate amount of money to have students achieve at the levels dictated by NCLB.

The equity findings of the costing-out study highlighted several issues. First, wealth as defined as "personal income and property value" (Commonwealth of Pennsylvania State Board of Education Summary of Costing Out Study, 2007, p. 2) was different throughout the state. When reviewing the extreme cases throughout the state, some districts were "70 times wealthier" (p. 2) than others. The report did acknowledge that less wealthy districts did receive more state funding than wealthier districts, but the authors concluded that the difference in funding was not enough to achieve equity, since a significant percentage of school funding comes from local resources. Next, the report highlighted that the districts with the most need attempted to tax highest at the local level and that the opposite was true for the districts with the least amount of need. In the end, the report compared the funding for schools in Pennsylvania to that of the states that surround Pennsylvania. Taxes were found to be lower than the average of the surrounding states, and it was determined that if Pennsylvania would tax at the average of the

surrounding states, the school districts would stand to gain an additional $6.02 billion for education.

Other reports and studies have addressed funding within Pennsylvania schools. Mitra (2011) compared data from Pennsylvania to data from the United States as a whole. For example, her report highlighted that even when funding is analyzed and federal stimulus dollars from the ARRA are accounted for, the highest funding percentage is made up of local dollars. At that time, 57.5 percent of funds were local, 33.9 percent were state, and 7.3 percent were federal, while 1.3 percent were other sources of revenue. The Education Law Center (2013) provided similar numbers to Mitra (2011), citing that local dollars comprised 53 percent of the revenue Pennsylvania school districts receive, but their study also found that the national average that schools received from local resources was much lower at 44 percent. According to that study, Pennsylvania schools received less funding at the federal level (−2.1 percent) compared to the national average and less at the state level (−7.7 percent), which all had to be made up at the local level. In addition to identifying funding discrepancies among local, state, and federal revenue sources, the report provided a list of factors that, similar to what the costing-out study of 2006 found, affect basic education funding and are used by other states. The appendix to the Education Law Center study is important, as it identifies variables that could be part of this study and are compared against student and school SPP performance. For example, basic variables include student count, taking into account students from low-income families, students with disabilities, English language learners, a base cost for each student, poverty level of the district, cost of living within the district, tax effort within the district, a factor for small districts, and finally, a target level calculation related to

adequacy. In Appendix B, the study provided a snapshot of all 50 states; the authors identified which variable each state uses. Pennsylvania and North Carolina were the only two states that did not take into consideration any of the variables.

**Current Era of Financial Accountability**

In June 2006, the Pennsylvania state government passed Act 1. The Act was later revised in 2011. The law had many intentions, but one of the more significant sections of the law related to taxes. Prior to Act 1, school directors and superintendents had greater freedom to levy taxes on school district taxpayers. Act 1 provided a formula that is calculated for each school every year and determines the amount of taxes the school board can levy on a district. For example, if a school board and superintendent would need to propose a tax increase that is greater than the allowable rate determined by the index, they would now have to seek voter approval through a referendum process. Subsection 331.2 of the law provides specific guidelines associated with how the questions will appear on the ballot. So, if school directors wanted to raise taxes, they would now not have the sole ability to do so: The constituents of the school district would have to vote and agree to the increase. Act 1 changed the budgeting process for school districts by requiring an earlier creation of a budget, which then has to be presented to the public in enough time to go to ballot in May.

The PDE 2028 general fund form provides a template for each school district to use (PDE, n.d.-b). A school district must pass a final budget by June 30 of each year. Prior to adopting a final budget, the school district must adopt a proposed budget and allow the public to view the proposed budget at least 10 days prior to adoption.

The numbers used to create a general fund budget are based on assumed revenue and assumed expenses. Each year, each school district in Pennsylvania will have a local financial audit to review the previous year's budget and provide actual revenue and expenditure numbers. The form that is submitted in the fall of each year for the fiscal year ending the previous June comprises the annual financial report.

The passing of Act 1 is not the only initiative that has limited the financial decision-making autonomy of school districts. The presence of charter schools has also limited the financial decision-making freedom as students are able to choose to attend charter schools and cyber charter schools in Pennsylvania. In the late 1980s and early 1990s the charter school movement was seen as a way to help create innovation within the education system in America (Griffith, 2014). The services students receive from cyber charter and charter schools looks similar throughout the United States, but the funding looks quite different in Pennsylvania (Griffith, 2014). Some states choose to fund the cyber charter and charter schools from the state government, while other states such as Pennsylvania fund cyber charter and charter schools by the resident school district of the attending cyber charter for charter school student (Griffith, 2014). School districts in Pennsylvania are mandated by PDE and the PA legislature to pay the tuition for a student to attend a cyber charter or charter school students (Griffith, 2014). Budgets within school districts are already overwhelmed and due to Act 1 there is a ceiling of how high the local school directors can increase taxes. School districts are faced with losing funding dollars to cyber charter and charter schools while the dollars spent on students who attend cyber charter and charter schools are not able to help or be recognized on the SPP score a school district receives.

## The Need to Improve and Invest in Education

In the early 1980s, *A Nation at Risk: The Imperative for Education Reform* brought to light areas of weakness in U.S. schools (NCEE, 1983). This was the beginning of a new era of accountability in the U.S. school system; student performance would now be identified and compared to other countries and then published for access by the U.S. population. Specifically, the report identified indicators of risk; although not all-inclusive, the report identified that student performance on standardized tests was declining, students entering college were in need of remedial classes in math, and students did not possess "higher order intellectual skills" (p. 17) now identified as 21st-century skills. The deficits noted resulted in businesses needing to remediate employees in basic academic skills. The report forecasted the need for a highly skilled workforce and the need for students to obtain those skills prior to entering the workforce (NCEE, 1983).

In 1991, the U.S. Department of Labor published *What Work Requires of Schools: A SCANS Report for America 2000* (SCANS report), identifying the skills needed for high school graduates to be successful and for the United States to maintain a competitive workforce. The SCANS report introduced the American public to the needs of the changing workforce. For example, the report highlighted that "new workers must be creative and responsible problem-solvers and have the skills and attitudes on which employers can build" (p. i). As a result of the report, educators and the public alike were left with a three-part blueprint to help improve the career skills of students prior to graduation. First, the report identified "basic skills," such as "reading, writing, arithmetic, listening, and speaking" (p. iii). Next, it identified "thinking skills," such as "creative

thinking, decision-making, problem solving, knowing how to learn, and reasoning" (p. iii). The final set of skills the report identified were "personal qualities," such as "responsibility, self-esteem, sociability, self-management, and integrity/honesty" (p. iii). In the end, the report identified areas of weakness and provided solutions for educators so that schools could begin to have students graduate career ready.

**Nonprofit Reports**

In addition to federal initiatives, many organizations provide national data on the need for career readiness skills in secondary education. For example, Jobs for the Future (JFF), a nonprofit organization, publishes information describing the skills needed for success in the workforce (Allen, Hogan, & Steinberg, 1998). In 1998, JFF released a report, *Knowing and Doing: Connecting Learning and Work,* that identified techniques schools should use to teach career skills to students (Allen et al., 1998). The report described the need for students to learn higher order thinking skills, problem-solving skills, and creativity, while noting that learning should be rigorous and applied. In 2014, JFF released an impact report demonstrating the need for "ensuring . . . workers have the skills and credentials needed to succeed in our economy" (p. 1).

The Harvard Graduate School of Education spearheads a network, Pathways to Prosperity (PTP), that provides information about the skills youth need when entering the workforce. In 2011, PTP released *Pathways to Prosperity: Meeting the Challenge of Preparing Young Americans for the 21st Century*, which discussed the changes in the workforce since the 1970s (Harvard Graduate School of Education, 2011). The report explained that since the 1970s, the number of employees in the workforce with a high school diploma or less shrunk from approximately 72 percent to 41percent. The shift in

the educational needs of the workforce demonstrates a "skills gap" (p. 4) between the education students receive and the skills needed in the workforce. The report called on educators to ensure that students know more than just academic skills; rather, they need to have marketable skills through which they can relate their academic learning to the real world. In the end, the report identified the skills needed in the workforce along with the strategies schools should use to ensure student success upon graduation.

The Career Readiness Partner Council was created in 2012 with the purpose of bringing "clarity and focus" (Career Readiness Council, 2012, p. 1) to the term *career ready*. The council is made up of 28 major organizations and businesses, including Ford Motor Company and the National Governors Association. The council provides guidance on what it means to be a career-ready person. Furthermore, the council speaks of academic and technical skill knowledge and employability skills, such as communication skills, critical thinking, and problem solving, needed in the workforce.

**Employer Perceptions of Workforce Preparedness**

School districts feel pressure to meet academic and career standards not only from legislation and departments of education but also from the employers who do the hiring. Over the last 30 years, reports from both presidential initiatives and nonprofit organizations have identified the career skills students need prior to graduating from high school. With the moderately high number of career resources available, high school graduates should be prepared with career skills enabling them to be successful upon graduation.

Even though resources have been in place to guide K-12 educators for 30 years, survey data from nonprofit organizations have shown that little has been accomplished to

prepare youth to enter the workforce. In short, high school graduates are not prepared to enter the workforce (Haile, 2014). The Conference Board, Partnership for 21st Century Skills, Corporate Voices for Working Families, and Society for Human Resource Management created a consortium that provides national reports on the need for secondary students to gain career readiness skills prior to graduation. In 2006, the consortium surveyed employers about the knowledge of their newly hired employees. Employers rated the perceived skills of their employees at three educational levels: high school graduates, two-year college graduates, and four-year college graduates (Casner-Lotto, Barrington, 2006). The survey showed that 42 percent of the employers rated high school graduates as deficient in their overall preparation; 80 percent of employers rated the written communication skills of high school graduates as deficient, while professionalism/work ethic received a 70 percent and critical-thinking/problem-solving skills were rated 69 percent deficient. The ratings of employees with postsecondary education, such as two- and four-year degrees, improved, signifying that employers felt the most prepared employees were the ones who had the most schooling. In the end, even employees with four-year degrees were still viewed as 28 percent deficient in written communication. This was an improvement over high school graduates, but it still indicates a mismatch of skills even at the postsecondary level.

The research questions of the present study focus on student performance and per student expenditures. The research questions are economic in nature in that a dollar amount is associated with providing an education to students. The economic focus on student education can be seen in past laws and initiatives, such as NCLB and RTT, which support the idea of providing more accountability for student learning and more

accountability for tax dollars being spent to educate students. In essence, the community and taxpayers of a school district do not have unlimited wealth or resources to allocate to the public educational system. For example, the Library of Economics and Liberty (2012) described scarcity as "limitations—limited goods or services, limited time, or limited abilities to achieve the desired end" (para. 1). Since tax dollars are scarce, schools and communities must find ways to educate students at federal, state, and locally accepted levels of competence. It is important to study and identify relationships that may or may not exist between educational spending and the score a school district receives on the SPP website.

## Production Function Theory

School districts throughout Pennsylvania and the United States include many factors that affect student achievement. For example, for learning to take place, students need access to teachers who have knowledge in the subject area being taught. In addition, the teacher needs to have access to resources so that he or she can create curriculum. The teacher needs access to professional development that provides instructional strategies proven to be effective with children in today's classrooms. Students have basic needs, such as the opportunity to eat breakfast and lunch while at school and have access to after-school programs, clubs, and competitive sports. All of the resources that students and teachers need are related to economic production theory.

*Production theory* is a system in which inputs are measured against resulting outputs, or outcomes. Put another way, "production function is a mathematical representation of the various technological recipes from which a firm can choose to configure its production process" (Besanko & Braeutigam, 2005, p. 185). Helmy (1981)

described production theory as "any entity using economic inputs such as land, labor, materials, capital and managerial ability to produce outputs of goods and services" (p. 13). Ryan (2012) described production function theory as an effort to find the most efficient way to produce goods. He also discussed how manipulation of inputs affects the output of products in the system.

When discussing production theory, it is helpful to understand additional terms and definitions. Besanko and Braeutigam (2005) provided concepts and terms associated with production function theories. The authors identified the mathematical equation for a simple production function as $Q = f(L, K)$, "where $Q$ is the quantity of the output, $L$ is the quantity of labor used, and $K$ is the quantity of capital used" (p. 185). The equation not only shows the effect of labor and capital on output but can also be manipulated to identify terms such as the labor requirements function, which can be represented as $L = g(Q)$. This equation can identify the relationship or amount of labor needed to provide a certain output.

As Besanko and Braeutigam (2005) explained production function, they moved the discussion from simple inputs and outputs to the topic of marginal returns. Given a set of inputs into a company, the result can be described as either increasing marginal returns, diminishing marginal returns, or even diminishing total returns. Increasing marginal returns are represented as an increase in the quantity of labor, which increases total output at an increasing rate. Simply put, there is a direct relationship showing the more labor capacity that is added to a company also provides an increase in the total output of the product for the company. The term *diminishing marginal returns* describes the scenario in which a company adds labor and experiences increased output but the

effect of the amount of labor grows weaker. Finally, *diminishing total returns* is the phrase used when a company has exceeded its ability to add additional of labor and see an increased amount of output. Simply put, the current configuration of the company will not allow additional inputs of labor to increase the overall output. This also means the additional labor resources can be connected to the company producing less of an overall output.

As their discussion about production function continued, Besanko and Braeutigam (2005) explained terms such as *average product of labor*, "which is the average amount of output per unit of labor" (p. 188), and *marginal product of labor*, or "the rate at which total output changes as the firm changes it quantity of labor" (p. 189). The equations for each follow:

$$\text{MPL} = \frac{change \text{ in quantity of output } Q}{change \text{ in quantity of labor } L} \mid K \text{ is held constant}$$

$$\text{MPK} = \frac{change \text{ in quantity of output } Q}{change \text{ in quantity of labor } K} \mid L \text{ is held constant}$$

Average product of labor and marginal product of labor are important concepts included in the discussion of production theory. An additional term for discussion is *marginal rate of technical substitution of labor and capital*, which is defined below:

> The rate at which the quantity of capital can be *decreased* for every one unit *increase* in the quantity of labor, holding the quantity of output constant, *or* The rate at which the quantity of capital must be *increased* for every one unit *decrease* in the quantity of labor, holding the quantity of output constant. (p. 198)

Production functions can be described several ways. For example, substituting one input with another and still having the same output is known as a *linear production function*. On the other hand, if a production function has a specific combination of inputs

to achieve a desired output, that is known as a *fixed production function*. Lastly, if the production function can have the capital and labor substituted for each other but the amount of each can change as one or the other increases, this is known as the *Cobb–Douglas production function*.

Over the past century, it has been common for business practices to be applied to the world of education. Duzer (2006) described the effect of factories and industrial production on the educational system around the turn of the twentieth century:

> At the turn of the last century, to facilitate the training of workers needed for the growth of mass production industries and to accommodate the popular demand for education, the nation's educational institutions were gradually transformed from the one room school house to a system built on a mass production model. The shift was an example of how business models are sometimes applied to education. Having proven the power of mass production models during the civil war and with the rapid growth of industry in the waning decades of the 19th century, the "factory model" of education seemed to promise similar efficiency and effectiveness in meeting the challenges of a growing nation. (p. 10, para. 2)

Throughout America, classrooms and teaching methods mirrored the industrial setting of mass production, and the costs associated with operating a school would soon become a national debate. During the twentieth century, economists and researchers attempted to determine how production function theory relates to the educational system. The first major attempt to look at inputs versus outputs of the educational system resulted from the Civil Rights Act of 1964. Approximately two years later, Congress asked James Coleman to conduct what became one of the most significant studies on the educational

system, *Equality of Educational Opportunity*, also known as the Coleman Report. The report was more than 700 pages in length and was broken down into nine sections. The report began with Section 1 as a summary report, which detailed the results of the report. Section 2 provided more than 175 pages of information describing school facilities, services, and curricula along with the characteristics of the staff and students who participated in the study. In addition, the data were broken down into metropolitan areas (North, South, East, and West) of the United States. Section 3 outlined pupil achievement and reviewed outcomes of schooling, school factors, and achievement, and, finally, integration and achievement of minority and majority students. Section 4 provided data on students who participated in course work that led to teaching careers. Students identified as future teachers of minority groups were studied. Section 4 of the study articulated that there was academic preparation among White students who wanted to become teachers but that such academic preparation for Black students did not exist. Section 5 reviewed data about minority students and higher education. The goal was to provide a description of the proportion of Black students of the student body of higher institutions, the proportion of Black students earning doctorates, and the distribution of Black students by type of institution. Section 6 reviewed the non-enrollment rates as measured by the 1960 census and primarily focused upon students aged 14-19 years. Section 7 reviewed case studies involving school integration, for example, racial balancing at the elementary and secondary levels along with performance levels of minority students. Section 8 reviewed special studies that focused on the disadvantages for non-native speakers of English; guidance counselors and vocational education were also discussed in addition to the work of teachers and administrators.

The Coleman Report identified educational disparities throughout the United States. First, the report found that schools were still segregated for both White and Black students. The report detailed the many characteristics (or inputs) of the schools at that time, including access to small classrooms, teachers with master's degrees, and principals who made more than $9,000 a year, to name a few of the many variables taken into consideration from surveys of both elementary and secondary students. In addition, the survey also asked questions about literature in the home, such as the presence of encyclopedias and the educational levels of the parents. The report acknowledged standardized testing for students in Grades 1, 3, 6, 9, and 12. Coleman (1966) also made mention of differences in the data among schools, but overall, he identified inputs and outputs that were similar across all schools. The Coleman Report brought the following issues and concerns to light:

1. The average white student's achievement seems to be less affected by the strength or weakness of his school's facilities, curriculums, and teachers than is the average minority pupil's. To put it another way, the achievement of minority pupils depends more on the schools they attend than does the achievement of majority pupils (p.22).
2. . . . Teacher quality seems more important to minority achievement than to that of the majority. . . . Among those measured in the survey, however, those that bear the highest relationship to pupil achievement are first, the teacher's score on the verbal skills test, and then his educational background both his own level of education and that of his parents. On both of these measures, the level of teachers of minority students, especially Negroes, is lower (p.22).

3. Finally, it appears that a pupil's achievement is strongly related to the educational backgrounds and aspirations of the other students in the school. . . . If a minority pupil from a home without much educational strength is put with schoolmates with strong educational back-grounds, his achievement is likely to increase. (p. 22)

After the Coleman Report was published, economists continued to study how resources and money correlate with educational attainment.

Although the idea of calculating a production function had been around for most of the twentieth century, the study of the educational production function has been around since the 1970s. For example, Samuel Bowles (1970) explained production function as "an educational production function is the relationship between school and student inputs and a measure of school output" (p. 12). He further clarified the definition as "the relationship between school inputs and conventional outputs, such as achievement scores" (p. 12). He also explained that there are differences in production functions for different racial and social groups His formula and definitions for educational production function are as follows:

$$A = f(X_1 \ldots, X_m, X_n \ldots, X_v, X_w \ldots, X_z)$$

where A is some measure of school output, for example, a score on a scholastic achievement battery, and $X_1 \ldots X_m$ are variables measuring school environment. The variables would typically include the amount and quality of teaching services, the physical properties of the school, and the length of time that the student is exposed to these inputs. $X_n \ldots X_v$ are variables representing environmental influences on learning outside the school, for example, the parents' educational attainment, and $X_w \ldots X_z$ are

variables representing the student's ability and the initial level of learning attained by the student prior to entry into the type of schooling in question.

Todd and Wolpin (2003) performed student educational production functions. Similar to Bowles (1970), Todd and Wolpin (2003) reviewed data and modeled equations that would help identify the value and importance of inputs and outputs of schools. For their conceptual framework, they created a framework defined as "a statistical model for cognitive achievement as measured by test performance at some particular age . . . the outcome of cumulative process of knowledge acquisition" (p. F15). The statistical model and definitions follow:

$$T_{ija} = T_a\{\mathbf{F}_{ij}(a), \mathbf{S}_{ij}(a), \mu_{ij0}, \Sigma_{ija}\}$$

The authors held that $T_{ija}$ was the measure of achievement for child $i$ residing in household $j$ at age $a$. They explained that they "conceive of knowledge acquisition as a production process in which current and past inputs are combined with an individual's genetic endowment of mental capacity . . . to produce a cognitive outcome. . . . We assume that inputs reflect choices made by parents and schools. . . . The vector of parent-supplied inputs at a given age as $F_{ija}$, school-supplied inputs as $S_{ija}$, and the vectors of their respective input histories up to age $a$ as $F_{ij}(a)$ and $S_{ij}(a)$ . . . a child's endowed mental capacity be denoted as $\mu_{ij0}$, . . . then, allowing for measurement error in test scores, denoted by $\Sigma_{ija}$"(p. 15).

Similar to Bowles (1970) and Todd and Wolpin (2003), Erik Hanushek has conducted studies on economics and education. In 1979, Hanushek authored a paper discussing the conceptual and empirical issues with the estimation of educational production functions. In his study, prior to providing an opinion, he acknowledged two

conceptual models that have been used to estimate an educational production function. The first model is as follows:

$$A_{it} = f(B_i^{(t)}, P_i^{(t)}, S_i^{(t)}, I_i)$$

"where $A_{it}$ = achievement at a time $t$; $B_i^{(t)}$ = vector of family background influences cumulative to time $t$; $P_i^{(t)}$ = vector of influences of peers cumulative to time $t$; $S_i^{(t)}$ = vector of schools inputs cumulative to time $t$; and $I_i$ = vector of innate abilities" (p. 363). Since this is a conceptual model, it only takes into account a snapshot of student achievement; another accepted conceptual model borrowed from the field of economics was allowed for the difference in vectors over a period of time or $t^* - t$:

$$A_{it} = f^*(B_i^{(t-t)}, P_i^{(t-t)}, S_i^{(t-t)} I_i, A_{it^*})$$

Production function models have been a part of the educational system for the last 40 years. During the same time period, there has been an ongoing debate over studies that apply an educational production function model. In the 1990s, Greenwald, Hedges, and Laine (1996) wrote a response in an article titled "Interpreting Research on School Resources and Student Achievement: A Rejoinder to Hanushek," which was published in *Review of Educational Research*. The goal of the article was to provide a response to Hanushek's writing over the previous 20 years. The rejoinder concerned the four areas on which the authors did not agree with Hanushek, which focused on the input of money into the educational system and whether using modeling techniques, such as the educational production function and regression statistics, yielded positive, neutral, or negative results. In response to the meta-analysis, Hanushek, Greenwald et al. contended that Hanushek did not interpret the data to show there were positive associations between school resources and school performance. The authors also highlighted the idea

throughout their meta-analysis that additional resources and funding did not show any negative outcomes associated with student outcomes. They went on to explain that Hanushek counted coefficient estimates rather than independent studies. If a study had five coefficients that did not show a relationship between funding and education, Hanushek was apt to count them each individually, instead of counting that independent study as one study, as Greenwald et al. would have. The end result was that because of the studies Hanushek included, he was able to overemphasize negative studies and, in turn, skew the data where funding did not look like much of a factor in the educational system. In the end, the rejoinder stated that

> our findings, which demonstrate that money, and the resources those dollars buy, do matter to the quality of a child's education. Thus policies must change to ensure that all children have sufficient resources and that incentives to spend those resources wisely are in place. (p. 415)

Hanushek's publications that suggest money does not have an overall effect on student performance and outcomes have not only been countered in the 1990s by Greenwald et al. (1996) but as recently as 2016 by Bruce Baker in *Does Money Matter in Education?*, which was published by the Albert Shanker Institute. Baker focused on several questions. The first question was, Does money matter? The report concluded that increased spending and funding related to per pupil costs is associated with higher student outcomes. The second question was, Do schooling resources that cost money matter? Again, the report found that strategies that cost money, such as smaller class sizes, additional supports, and competitive salaries for educators, are positively associated with higher student outcomes. The third question was, Do state school finance

reforms matter? The report also found that adequate funding and increased accountability are associated with improved student outcomes. When reviewing the data and providing a historical perspective, Baker went back to the Coleman Report and Hanushek's publications stating there did not appear to be a correlation between school funding and student achievement.

Throughout the paper, Baker (2016) referenced other studies. For example, he referenced Konstantopolous and Chun's (2009) reevaluation of the Tennessee STAR data, which studied the effects of smaller class sizes and suggested that there are positive student outcomes associated with the increased spending to support those smaller classes. In addition, Jackson, Johnson, and Persico (2016) found that selective and substantial infusions of money into public schools in the 1970s and 1980s reaped positive outcomes in regard to graduation rates and adult incomes. Baker (2016) discussed the production function and how, when viewed differently, it turns into a cost function. "Like production function research, cost function research seeks to identify the link between spending variation and outcome variation, cross-sectionally and longitudinally. The goal of the education cost function is to discern the levels of spending associated with efficiently producing specific outcome levels" (p. 12). Baker went on to provide several statistical models associated with cost function, below, but first the traditional educational production function is used:

$$\text{Outcomes} = f(\text{Spending, Students, Context})$$

For the cost function,

$$\text{Spending} = f(\text{Outcomes, Students, Context})$$

This statistical model is derived from the idea that "achieving higher educational outcomes, all else being equal, costs more than achieving lower educational outcomes" (p. 14).

## Economies of Scale

In addition to the production function, educational production function, and cost function theories, an additional theory is related to this study, because the purpose of this study is not only to review inputs, such as wealth and district expenditures, against outputs in the form of student achievement on high-stakes standardized test scores. This study will also review the cost per student versus the corresponding SPP website score. Economies of scale take into consideration that on a per student basis, a smaller school will be more expensive to operate than a larger school based solely on the quantity of students attending (Stringfellow, 2007). For example, if two schools with the same operating costs were to be compared, the school with the higher number of students would have the lower per student cost. This factor must be considered as this study reviews data from small, rural school districts compared to large, urban school districts.

## Previous Studies Between Student Performance and Per Pupil Expenditures

The study of student expenditures and the resulting student performance is not new. The Coleman Report (Coleman, 1966) reviewed various factors that can affect a student's education. Specifically, the Coleman Report provided an example of student performance data and student expenditures, highlighting that the two variables are related. In Coleman's example graph with fictitious data, the more student expenditures increased, the more student test scores rose. Many authors have reviewed student performance and student expenditures. For example, Childs and Shakeshaft (1987)

performed a meta-analysis quantitative study in the mid-1980s to review the impact of educational expenditures on student performance. Throughout the study, 45 previous studies were utilized to determine an *r* score through 417 correlational coefficients. The study was important because the authors could place a score on the impact of spending on student achievement. Overall, the authors identified 14 studies that found a relationship between educational expenditures and student performance. An additional 12 studies had relationships under certain circumstances.

Davis, Marcum, Mitchell, and Redlich (2007) performed a quantitative study to determine the impact of educational expenditures on student achievement. Data from 2001 to 2005 were utilized from 445 school districts in Missouri. The study found a positive correlation between educational spending and student achievement. Steelman (2008) found similar results in a quantitative study of fifth- and seventh-grade students taking mathematics and reading TAKS tests in Texas. The study looked at Chapter 41 (property wealth) and Chapter 42 (low to medium property wealth) districts. Instructional student expenditures were compared to student performance on the TAKS tests. The results of the study show that students in wealthier districts had a higher mean amount of spending compared to the medium to low schools' spending. The resulting student performance indicated a relationship between higher student expenditures and higher student scores on the mathematics TAKS test.

Lewis (2009) performed a quantitative study in Minnesota that compared eighth-grade mathematics and reading scores against student expenditures. The study included data from 2006, 2007, and 2008. The author performed a product-moment correlation calculation and found a relationship between eighth-grade mathematics and reading and

student expenditures. Arrington (2010) performed a study using data from Illinois public schools to determine if a relationship existed between instructional per pupil expenditures and student achievement. The author utilized five funding variables: (a) instructional expenditures per student, (b) noninstructional expenditures per student, (c) administrator salaries, (d) teacher salaries, and (e) schoolwide Title I funds. As evidenced by a Pearson moment correlational analysis, all variables but noninstructional expenditures had a positive significant correlation to student performance.

Terry (2011) conducted a quantitative study (Pearson product correlation) to determine which spending areas most affected student performance in the state of Texas. The author concluded that a weak to moderate correlation existed in regard to instructional spending and student performance on the TAKS and SAT assessments. Gao (2011) performed a quantitative study using descriptive statistics, including analysis of variance (ANOVA), to determine if a correlation existed between educational spending and student performance. The study reviewed student mathematics scores in Florida from 2002 to 2006 and found that a correlation existed between student expenditures and student achievement in math.

Ryan (2012) performed a quantitative study using statewide data about all Rhode Island schools. The author used descriptive and regressive statistics to arrive at a dollar amount to effect change in schools. For example, the author calculated the amount of change on NECAP scores in reading, writing, and mathematics. In the end, the author found a correlation between instructional expenditures and student performance on the NECAP assessment.

Davidson (2015) performed a quantitative study using six Pearson moment correlation calculations for students who receive special education in the state of Tennessee during 2010–2014. The study used a null hypothesis and found a positive correlation between educational spending and the performance of students who receive special education on state assessment exams.

## Relationships Between Student Performance and Wealth

The SPP website not only provides an overall criterion score along with student expenditure information but also provides information about the wealth within the district and the wealth within households, which is defined by the number of students who are economically disadvantaged. Not only have past studies contained student expenditures and student performance but numerous reports have focused on student performance and wealth of the district and/or income of the parents. For example, Malone (2000) conducted a quantitative study using data from 1997 to 1998 in the Texas educational system. The author reviewed the amount of money districts had in their general funds and fund balances. Those financial data were compared to student performance in the districts. As a result of the study, the author came to one of several conclusions: The districts with the higher percentage of fund balance as compared to their general fund had the highest student performance, and the higher the percentage of the general fund that was spent on instruction, the higher student achievement resulted.

Richmond (2007) conducted a quantitative study of middle school students in the state of Virginia. Using basic descriptive statistics and multiple regressions, the author found gaps in student performance between students who were economically advantaged and economically disadvantaged. Stringfellow (2007) reviewed data from schools in

Rhode Island and found that as the wealth of the district increased, so did the achievement of the students on the statewide New Standards Reference Examination.

Heier (2011) found in Texas during the school year 2008–2009 that a correlation existed between Title I schools and non–Title I schools. To receive Title I funds, a school must meet several criteria, one of which is 40 percent or more of the population of students must be considered economically disadvantaged (PDE, 2015c). Heier found that students who attended non–Title I schools scored higher on the mathematics and reading TAKS tests.

Baker (2015) performed a quantitative study and focused on local fiscal capacity and student performance in Virginia schools during the school year 2009-2010. The study found a relationship between student performance and household income (poverty). Sable (2015) performed a mixed-method study in Pennsylvania, reviewing both economic and noneconomic indicators of student success in all 500 public school districts. The data showed that the best predictor of student achievement was the socioeconomic disadvantage rate as determined by the MP/PI (student wealth). The lower the disadvantage, the higher the student performance.

### Relationships Between Student Performance and Other Factors

In addition to student expenditures, wealth of the district, and wealth of the students' families, research has found other factors to relate to student performance in school districts across the United States. Harter (1998) conducted a quantitative study to review relationships between spending via different function codes and student performance of fourth-grade students in 2,800 public elementary schools. Harter identified a correlation between merit pay for teachers and student performance and

building upkeep and student scores. Dalton (2010) conducted a quantitative study to evaluate whether there is a direct correlation for professional development for teachers and student achievement. The study had several null hypotheses. In the end, the study did find a correlation between student scores on the eighth- and eleventh-grade TAKS test and the money invested in teacher professional development.

Moore (2012) conducted a study to identify correlations between function codes and student performance in Grades K–8 in Oklahoma. The study found that schools that invested in facilities acquisition and construction had higher student performance on standardized tests. Similarly, Benson (2015) performed a mixed methods study in which capital outlay expenditures were compared to math SAT student performance scores in the state of Georgia for the years 2004-2008. The study found a weak correlation between capital outlay expenditures and student performance. The author followed up the calculations with open-ended surveys of superintendents, which correlated with the results of the data.

Gordon (2015) conducted a quantitative study in Colorado for the school years 2005-2009 to determine if school consolidation has an impact on student performance. Gordon used *t*-tests and regression and rejected the null hypothesis that consolidation does not have an impact on student learning. The study was limited, as it included in-depth study of only eight school districts. Finally, Ryan (2012) studied student achievement in the Rhode Island public school system. One of the main themes of his study was student performance on the state-administered test and percentage of students who received free and reduced-price lunch. His study found that the two were negatively

correlated. For example, as the percentage of students receiving free and reduced-price lunch increased, student performance decreased.

**Studies That did not Find Relationships Between Expenditures and Achievement**

Hanushek's (1986) article in the *Journal of Economic Literature* referenced the Coleman Report, and throughout his article, the author referenced the multiple studies that have attempted to link characteristics associated with increased costs or student expenditures with student performance. In the article, Hanushek found that there was not consistent evidence to support the idea that student performance in U.S. schools is tied to student expenditures. More recently, other authors have come to the same conclusion as a result of their individual studies. Goins (2015) conducted a quantitative study about student expenditures and student performance using ACT scores of eleventh- and twelfth-grade students in Tennessee from 1998 to 2009. Through linear regression and descriptive statistics, the author found that there was not a significant correlation between the two. Doyle (2015) performed a quantitative study to determine if any correlations existed between the funding of schools and student performance along with student performance and the unemployment rate in Ohio with data from 2005 through 2012. The author found that per pupil funding did not have a correlation to student performance.

Adcock (2015) performed a quantitative study in Colorado analyzing the third- and tenth-grade scores on standardized tests and funding for the school year 2012–2013. The author used a Pearson correlation and ANOVA to evaluate the data. In the end, the author did not find a significant correlation between student expenditures and student performance. Finally, Turley (2009) studied student achievement and educational spending in the Texas public school system. In her study, student achievement on the

Texas high-stakes test along with student achievement on the SAT test were the dependent variables. Through regression statistics and correlational analysis, Turley determined any relationships between the variables. The study revealed that there was not a significant correlation between spending from the general fund and student achievement on the Texas high-stakes test.

## Summary

Throughout the last 200 years, the government has played an increased role in providing primary and secondary education, including creating laws (e.g., the PSC, ESEA, and NCLB) and issuing reports (NCEE, 1983; U.S. Department of Labor, 1991). Nonprofit organizations and private companies have been providing input into the strengths and weaknesses of students who graduate from high school and their ability to adapt and provide value to the American workforce (Casner-Lotto, Barrington, 2006; Haile, 2014; Harvard Graduate School of Education, 2011; Jobs for the Future, 2014). As a result of NCLB, schools were required to increase student achievement across multiple subject areas and subgroups of students. From the time NCLB was passed in the early 2000s, school districts had until 2014 to have 100 percent of all students proficient in reading and mathematics. Schools faced the academic challenges of NCLB, but they experienced financial challenges with the passage of Act 1 of 2006. School directors no longer had the power to raise taxes without adhering to index limits. This law, coupled with the recession from 2007 to 2009, placed financial difficulties on all levels of government, including school districts.

In an attempt by legislators to hold school districts accountable for their spending, Act 82 of 2012 placed increased pressure on school districts, educators, and students. In

2013, PDE applied for a waiver to the federal government so that Pennsylvania would demonstrate transparency and accountability through multiple measures, one of which included the SPP website. Since school districts are governed by locally elected school board members, each district may experience different forms of school district goals and school district spending. The one aspect that links all Pennsylvania schools is the SPP website and rating. After reviewing other studies in which student performance and student expenditures were examined (Arrington, 2010; Childs & Shakeshaft, 1987; Davidson, 2015; Davis et al., 2007; Gao, 2011; Lewis, 2009; Ryan, 2012; Steelman, 2008; Terry, 2011), the researcher of the present study performed descriptive analysis on the SPP scores and per student expenditures to determine if relationships between the two exist. Specifically, if relationships do exist, the researcher attempted to determine if student performance increases to a certain point before leveling out (plateauing) in student performance or even declining (optimal). This study is significant as it will provide 499 school districts with information about student performance on the SPP website and per student expenditures. In the end, each school district will be able to compare its data against the numbers derived in this study.

# CHAPTER THREE

# METHODOLOGY

## Introduction

Throughout our nation's history, education has changed continually to meet the needs of students, parents, and businesses. Since the recession of 2009, funding and costs associated with public education have fueled an era of accountability in which school districts have had to make hard choices between fiscal responsibility and providing resources so students can achieve at adequate performance levels often mandated at the state and federal levels. As a result, funding for each school varies, and educational opportunities can be drastically different from one school to the next.

## Purpose of the Study

The purpose of this study is to analyze data across Pennsylvania schools and determine if the dollar amount spent in specific areas influences SPP scores. As a quantitative study, archival information will be retrieved, reviewed, and compared against other public schools in Pennsylvania. All data will be retrieved directly from the PDE financial AFR databases and the SPP website data files.

Similar studies have compared student achievement against the wealth of districts and/or parents. For example, Malone (2000) conducted a quantitative study using data from 1997 to 1998 in the Texas educational system. The author found that districts with the higher percentage of fund balance as compared to their general fund had the highest student performance, and the higher the percentage of the general fund that was spent on instruction, the higher the student achievement. Stringfellow (2007) reviewed data from schools in Rhode Island and found that as the wealth of the district increased, so did the

achievement of the students on the statewide New Standards Reference Examination. Heier (2011) found that students who attended non–Title I schools scored higher on the mathematics and reading TAKS tests. Baker (2015) performed a quantitative study and found a relationship between student performance and household income (poverty). Sable (2015) performed a mixed methods study in Pennsylvania, where he reviewed both economic and noneconomic indicators of student success in all of the 500 public school districts. The data showed that the best predictor of student achievement was the socioeconomic disadvantage rate as determined by the MP/PI (student wealth). The lower the disadvantage is, the higher the student performance.

Given the review of data files from the SPP website, which includes specific information about each school, and the approved annual financial reports (AFR) submitted to the PDE by each school district each fiscal year, relationships between variables can be studied. The data will be evaluated in such a way as to provide per pupil costs associated with benchmark SPP scores. Through modeling and correlational analysis, schools can begin to understand the overall relationships between school district spending and resulting SPP scores. In the end, this study will provide a blueprint with examples of how much money is enough to achieve a desired SPP score.

## Research Questions

The following questions are the focus of the study:

1. Is there a relationship between per pupil expenditures in instruction and SPP scores?
2. Is there a relationship between per pupil expenditures in support services and SPP scores?

3. Is there a relationship between total per pupil expenditures and SPP scores?
4. Is there a relationship between the amount of federal dollars a school district receives and SPP scores?
5. Do other factors that are not financial in nature influence SPP scores?
    a. Special Education Population
    b. Economically Disadvantaged Population
    c. English Language Learners

## Hypotheses

As a quantitative study, the following null hypotheses are designed to answer the guiding questions for any relationships:

Null Hypothesis 1: There is no relationship between per pupil expenditures in instruction and SPP scores.

Null Hypothesis 2: There is no relationship between per pupil expenditures in support services and SPP scores.

Null Hypothesis 3: There is no relationship between total per pupil expenditures and SPP scores.

Null Hypothesis 4: There is no relationship between per pupil expenditures and federal dollars received by the district and SPP scores.

Null Hypothesis 5: There is no relationship between an SPP score and other factors.

## Research Design

To complete this study, the researcher will correlate achievement and financial data, which will allow the researcher to compare per pupil expenditures to student

performance and determine if there is a significant statistical relationship between the two. Several considerations were reviewed prior to choosing the type of method to best anwer the research questions. In selecting a methodology, the researcher reviewed several options: quantitative, qualitative, and mix methods approaches.

Creswell's work (2014) provides guidance and helps researchers choose the best approach to answering a set of research questions. He has described characteristics of a quantitative study as "creating purpose statements, research questions, and hypotheses that are specific, narrow, measurable, and observable" or as "analyzing trends, comparing groups, or relating variables using statistical analysis, and interpreting results by comparing them with prior predictions and past research" (p. 13). Additionally, quantitative research designs tend to fall into several categories, such as experimental research, in which the researcher seeks to find a correlation between one variable and its effect on another. Furthermore, quantitative studies can fall into the correlational research category, in which the researcher studies the relationships or associations between multiple variables (Creswell, 2014). In correlational designs, the researcher studies variables for which the goal is to provide a measure of degree or association using a process known as *correlational analysis* (Creswell, 2014). In the end, this study uses historical data from the 2015-2016 school year and compares a dependent variable against the independent variables of instructional expenses, support service expenditures, total expenditures, federal expenditures and non-expenditure variables.

Other research designs were considered prior to selecting a quantitative design. For example, to consider a qualitative study, the research design has an in-depth focus on a specifice idea or phenomenom (Creswell, 2014). Furthermore, rather than choosing to

review large-scale data pools of information, qualitative studies have a tendency to focus on a small number of individuals or participants. Additionally, qualitative studies tend to focus on proven theories and are associated with describing the research to the reader (Creswell, 2014). Because this study is a review of statewide data, which have a significant number of variables, a qualitative study was rejected.

Cresswell (2014) provided explanations of mixed methods and action research in which the intent can be to utilize facets of both qualitative and quantitative research methods. "Using quantitative and qualitative data for individuals to study education problems that they face in their setting" and "combining quantitative and qualitative data to best understand a research problem" (p. 20) are strategies researchers can utilize to ensure they are fully understanding a problem in a particular setting. This researcher rejected the mixed methods and action research method due to the goal of analyzing data from all schools. This research will be used as a guide or template by school district stakeholders to compare their data. Owing to the large number of school districts within the state of Pennsylvania, a mixed research methods design was not possible.

After choosing a quantitative research method, other aspects of the research design can then be considered. For example, the SPP scores of school districts with student enrollment of fewer than 1,500 students, 1,500 through 4,999 students, and 5,000 and more students will be reviewed. In addition, the cost per student will be compared against the average SPP scores of schools that have an SPP score in the following ranges: 0–69, 70–79, and 80 and above, respectively. Furthermore, additional variables for each school will be analyzed and categorized. The additional variables will include each school's special education percentage, percentage of students who are considered to be

economically disadvanated and percentage of English language learners. The researcher is hopeful that a statistical correlation will be revealed that will provide an optimal cost per student.

## Population

The population for this study will be collected through reviewing the source data from the Pennsylvania SPP website and includes all 499 public school districts within Pennsylvania, excluding charter and private school districts. Owing to the availability of data on the SPP website, the population data can be separated into multiple groups. For example, school districts are able to be separated by performance data on standardized tests (student performance), special education populations (student with diverse needs), and economic disadvantage (individual wealth of a family). Financial information for each school district is available through the PDE website. Financial data, such as local, state, and federal revenue, along with MV/PI aid ratios (wealth of the district), are also available for retrieval.

## Data Source

Similar to Sable's (2015) study, data will be drawn from the finance section of the PDE website. The information retrieved will provide the instructional, support services, overall expenditures, federal dollars, and other data available related to each school district. The data gathered will be used from each of the school districts and are extensive in nature. Additionally, the data are reported in the same manner and format, made available through PIMS. Not only are general budgets provided to the PDE after being approved by the local boards prior to the end of June each year, but each year Pennsylvania schools are required to have a local audit completed. This local audit

certifies the revenues and expenses, at which point the AFR is required to be submitted to the PDE. The PDE has also placed this information on its public website for viewing and retrieval.

School performance on the SPP website will be retrieved from all forms of data available at this website. The data files include information about each school building within the districts and the corresponding variables, such as the individual SPP score, student enrollment, special education percentage, and socioeconomic percentage. In the end, the same data from each school will be available in the same manner for review.

## Research Procedures

The design of this study will be quantitative ex post facto in that it will measure school data for a specific point in time (2015-2016 school year) across all public school districts in Pennsylvania.

Overall, Research Questions 1 through 5 will utilize an *r* score through the Pearson moment correlation equation. As a correlational study, independent variables will be compared against the dependent variable. The researcher will look for relationships between educational spending in instruction, support costs, total budget, federal dollars and noneconomic indicators. The first calculation will be to determine if a linear relationship exists between the dependent and independent variables. The relationship will be designated by a number defining the degree of association. The correlational coefficient will be between −1.00 and 1.00. Correlational coefficients with a score between .20 and .35 are said to have a slight relationship. As the association increases to .36–.65, there is considered to be a stronger relationship, while .66–.85 and

.86 and above are said to indicate a strong statistical relationship among the means of the two variables (Creswell, 2014). Following is the formula to determine the relationship:

$$r = \frac{n\left(\sum xy\right) - \left(\sum x\right)\left(\sum y\right)}{\sqrt{\left[n\sum x^2 - \left(\sum x\right)^2\right]\left[n\sum y^2 - \left(\sum y\right)^2\right]}}$$

Prior to calculating an SPP score, a weighted SPP score will be created for each district. Each district score will be an average of the weighted scores. Each building's weight will be determined by the percentage of district enrollment represented by the building.

Once a weighted district SPP score is calculated, districts will be broken down into three categories chosen by the researcher. The first category will be school districts with student enrollment of 0-1,499 students. The second category will be defined as school districts with enrollment between 1,500 and 4,999 students. The last category will be school districts with student enrollment greater than 5,000 students.

After each calculation, the independent variables that do not have a relationship with the dependent variables will be removed. The remaining dependent and independent variables will be put through a correlational matrix in which multiple regressions will be completed to see which independent variable or groups of independent variables have the most effect on the dependent variable. A list of the independent variables that will be entered into a correlational matrix are listed below in step 3.

**Step 1**

Because data from the SPP website are provided for each individual building and not as a district, a district score will need to be calculated. Each district score will be an

average of the weighted scores. Each building's weight will be determined by the percentage of district enrollment represented by the building.

**Step 2**

Once a weighted district SPP score is calculated, districts will be placed into three categories. The first category will be school districts with student enrollment of 0-1,499 students and are designated as "small" school district. The second category will be defined as school districts with enrollment between 1,500 and 4,999 students and are designated as "medium" school districts. The last category will be school districts with student enrollment greater than 5,000 students and are designated as "large" school districts.

**Step 3**

The following data will be entered into the SPSS program as independent variables so that each variable can be compared against the others. Each independent variable will be designated on the left-hand column running down the sheet. Across the top of the worksheet will be the corresponding variable. Table 1 shows a template that will be used to perform Pearson Correlations on all variables including Weighted SPP Score and Weighted SPP Categories (Below, At, and Above the PDE expected SPP Score of 70) for all expenditures and then for schools designated as small, medium, and large. The Pearson Correlation will allow significant correlations to be identified between the independent variables of the study and Weighted SPP Scores and Weighted SPP Categories. In addition, correlation analysis with school districts which are grouped by student enrollment performance (small, medium, large) will be analyzed.

Table 1

*Pearson Correlations All Variables*

| Model | W. SPP | SPP CAT | 1100 | 1200 | 1300 | 2100 | 2200 | 2300 | Total | Federal | SPED | ECON | ELL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W. SPP | | | | | | | | | | | | | |
| SPP CAT | | | | | | | | | | | | | |
| 1100 | | | | | | | | | | | | | |
| 1200 | | | | | | | | | | | | | |
| 1300 | | | | | | | | | | | | | |
| 2100 | | | | | | | | | | | | | |
| 2200 | | | | | | | | | | | | | |
| 2300 | | | | | | | | | | | | | |
| Total | | | | | | | | | | | | | |
| Federal | | | | | | | | | | | | | |
| SPED | | | | | | | | | | | | | |
| ECON | | | | | | | | | | | | | |
| ELL | | | | | | | | | | | | | |

**. Correlation is significant at the 0.01 level (2-tailed).

**Step 4**

Once the data are entered into the SPSS program and Pearson correlation calculations are complete, stepwise multiple regression will be conducted. The end result will be variables that have the most statistical effect on Weighted SPP scores and Weighted SPP Categories. Table 2 describe the format of stepwise regression calculations for the independent variables. The Beta calculation will determine the weight or relationship of the predictor variables on the Weighted SPP Score and Weighted SPP Categories. In addition, the significance column will provide the confidence levels of .05, .01, and .001. Additionally, at the bottom of each table an adjusted $r^2$ is calculated for each model which will provide the predictive effect of the models on Weighted SPP Scores and Weighted SPP Categories. Stepwise regression analysis will be conducted with the independent variables and Weighted SPP Scores, and

then Weighted SPP Categories. The groupings within the stepwise regression will include analysis done with all schools and then separately analyzed at the small, medium, and large school district levels. Table 2 provides an example of the format of the regression table which will be used throughout the analysis.

Table 2

*Stepwise Multiple Regression Models for W.SPP Scores and Non-Expenditure Variables*

| Independent Variables | Model 1 Dependent Variable | | | Model 2 Dependent Variable | | | Model 3 Dependent Variable | | |
|---|---|---|---|---|---|---|---|---|---|
| | β | t | Sig | β | t | Sig | β | t | Sig |
| Model 1 | | | | | | | | | |
| Model 2 | | | | | | | | | |
| Model 3 | | | | | | | | | |
| $R^2$ | | | | | | | | | |
| $\Delta R$ in $R^2$ | | | | | | | | | |

*p < .05, **p < .01, ***p < .001

## Data Analysis

Creswell (2014) provided terms and definitions related to quantitative tests. This research study will consist of one dependent variable (SPP scores) and multiple independent variables: (a) per student cost in instruction, (b) per student cost in support services, (c) per student cost in overall expenditures, (d) per student cost in federal dollars, (e) weighted SPP, (f) student enrollment category 0–1,499 (small), 1,500–4,999 (medium), 5,000+ (large), (g) special education percentage, (h) free and reduced-price lunch percentage (personal wealth), and (i) English language learners.

The dependent variable will be considered continuous in that there is no set category for the SPP scores since the scores range from 0 to 100. The independent variables will be considered continuous since they are also on a scale of 0-100, using the

special education percentage, economically disadvantaged percentages and English language learner percentages as examples. After reviewing the components of this research and the examples Creswell (2014) provided, a multiple regression will arrive at the statistical significance between the dependent and independent variables.

## Summary

This quantitative study reviewing student expenditures and student performance on the SPP website for the 2015-2016 school year will provide information to school directors as to how their schools compare to those of other districts throughout Pennsylvania. Research Questions 1 through 4 begin the study with a review of district spending to determine whether there are relationships between instructional, support services, and overall spending. For example, from a global perspective, are there any relationships between instructional spending (teachers) and overall spending (new buildings, sports, etc.) that impact the SPP score of a district? Research Question 5 will allow the researcher to review data that may also have an impact on the SPP score. School directors have control over the instructional, support services, and overall spending but do not have control over the special education population, family wealth, and district wealth. The answers to the research questions will unveil relationships between spending and student performance that can provide individual school districts the opportunity to compare themselves against the rest of the districts in the state of Pennsylvania.

# CHAPTER FOUR

# DATA ANALYSIS AND RESULTS

## Introduction

This chapter will detail and analyze the 2015-2016 archival data used to answer the five research questions of this study. Further, School Performance Profile (SPP) data was downloaded from the PDE website along with financial Excel sheets from the subsidy division of the PDE website. In addition to each variable, the data in this chapter are also categorized and analyzed by student enrollment and SPP benchmark scores. For example, the student enrollment categories are broken down into three categories: small-sized schools representing the student population range of 0-1,499, medium-sized representing the student population range of 1,500-4,999, and large-sized schools representing the student population range of 5,000 students and higher. These categories allowed any correlations or themes associated with the population size of schools to be more easily identified. Finally, in addition to student enrollment, each variable was analyzed through SPP benchmark scores of 0-69, 70-79, and 80-100, which allowed any differences in variables and influence on SPP scores to be identified.

To begin, each variable with the descriptive statistics are provided with the n, mean, standard deviation, minimum, maximum, and range of variable. Next, Pearson correlations using a Pearson R Score for SPP scores and all other variables are provided. Lastly, multiple regression analysis is provided, identifying the strength and order of associations between variables and SPP scores.

## Descriptive Statistics

A description of the weighted SPP score calculation is needed prior to reviewing the descriptive statistics for each variable. First, each building in a school district received an SPP score. To arrive at one number, a Weighted SPP score was calculated for each district by assigning a weight to each building based on the percentage of students enrolled to that of the entire district. Next, each building SPP score was then multiplied by the enrollment percentage. Finally, all the scores in the district were added together to create one Weighted SPP score. Each Weighted SPP score is represented below in the descriptive statistics in the W. SPP Score row.

In Table 3, descriptive statistics are presented; the mean Weighted SPP score for all 499 schools was 72.39. The standard deviation from the mean score was 8.44 while the minimum Weighted SPP score was 41; the maximum score was 92. The minimum expected level of achievement from PDE was 70. On average, then, a little more than 50 percent of the schools met the expected level of 70.

Table 3

*Weighted SPP Scores*

| | N | Mean | Standard Deviation | Min | Max | Range |
|---|---|---|---|---|---|---|
| W. SPP Score | 499 | 72.39 | 8.44 | 41 | 92 | 51 |

## Enrollment Categories

Student enrollment across Pennsylvania districts varies; each school district received one of three possible enrollment designations. School districts with student populations from 0-1,499 students received a designation of "small." School districts

with student populations from 1,500-4,999 received a designation of "medium." School districts with student populations of 5,000 and higher received a designation of "large."

In Table 4, the enrollment category provides information about the enrollment category variable. Small schools, which numbered 170, comprised 34.1 percent of the 499 schools, while medium schools comprised 52.1 percent, or the majority of all schools. Lastly, only 69 large schools, 13.8 percent of the total number of school districts, had student enrollments higher than 4,999 students.

Table 4

*Enrollment Categories and Frequencies*

| | Frequency | Percent |
|---|---|---|
| Small | 170 | 34.1 |
| Medium | 260 | 52.1 |
| Large | 69 | 13.8 |
| Total | 499 | 100.0 |

Table 5 provides descriptive statistics for the PDE Performance Level including the n count, mean, and standard deviation for each of the Weighted SPP Ranges. The mean total number of students per school district is 3,170. One hundred sixty-seven districts had weighted SPP scores below the PDE target of 70, which comprised 33.5 percent of the school districts. In addition, 48.5 percent of the school districts, met the PDE target between 70 and 79. Finally, 90 school districts scored above the PDE target in the 80-100 range. Given the data, double the number of schools were below the PDE expected level of achievement (0-69) than were above the expected range of (80-100). The mean enrollment number for schools that met the PDE threshold of 70 had the lowest

enrollment number of the three groups. The next highest mean enrollment number was under-performing schools, followed by the high-achieving school districts. One could interpret that student enrollment is linked to the SPP score, as the lowest mean enrollment met the PDE target. In addition, one could interpret that, on average, after a school reaches a certain student enrollment size (4,274) it may have more resources available to reach and exceed the PDE target.

Table 5

*PDE Performance Level by W. SPP Range*

| | N (Districts) | % of Total N | Mean (Students) | Std. Deviation (Students) |
|---|---|---|---|---|
| Below PDE Target (0-69) | 167 | 33.5% | 3,622 | 10762.28 |
| At PDE Target (70-79) | 242 | 48.5% | 2,449 | 1751.26 |
| Above PDE Target (80-100) | 90 | 18.0% | 4,274 | 3075.26 |
| Total | 499 | 100.0% | 3,170 | 6505.75 |

**Per Pupil Instruction**

The Per Pupil Instruction variable below is the total amount of funding spent on instruction, which was reported on each school district's Annual Financial Report (AFR) submitted to the Pennsylvania Department of Education (PDE). This range of expenditures begins with an account code of Regular Programs 1100 expenditures and ends with Pre-K Pass Through Funds 1807.

Table 6 provides descriptive statistics for the variables Per Pupil 1100 (regular education expenditures), Per Pupil 1200 (special education expenditures), and Per Pupil 1300 (vocational education expenditures) including n count, mean, and standard

deviation. The table breaks down the descriptive statistics by Weighted SPP scores which were below, at, and above the PDE target scores. At the bottom of the table, statistics are given for all 499 school districts in order to provide a comparison.

**Per Pupil 1100**

This variable represents regular elementary and secondary K-12 program instructional costs, which can also include early intervening services (Pa Office of the Budget, 2018). In Table 6, the descriptive statistics identify the mean per pupil regular education (1100) expenditures for all schools as $6,975 with a standard deviation of $1,561. Schools that did not meet the PDE Target weighted SPP score (0-69) had a mean regular education (1100) expenditure of $7,107 and a standard deviation of $2,202. Schools that met the PDE Target Weighted SPP score (70-79) had a mean regular education (1100) expenditure of $6,826 and had a standard deviation of $1,046. The schools that scored above the PDE target (80-100) had a mean regular education (1100) expenditure of $7,133 and standard deviation of $1,228. In the per pupil 1100 regular education expenditures, the data reflects the enrollment numbers in Table 5, which show that the schools making the PDE target score (70-79) have lower expenditures. One could also interpret the data to observe that schools with scores above and below the expected score of 70-79 spent more per pupil in regular education (1100) instructional expenditures.

**Per Pupil 1200**

This variable represents special programs designed to support students with special needs, and includes life skills, sensory support, emotional support, gifted, and early intervention support costs (Pa Office of the Budget, 2018). In Table 6, the

descriptive statistics identify the mean per pupil (1200) expenditures as $2,327 with a standard deviation of $873. Schools that did not meet the PDE Target Weighted SPP score (0-69) had a mean special education (1200) expenditure of $2,623 and a standard deviation of $1,157. Schools that met the PDE Target Weighted SPP score (70-79) had a mean special education (1200) expenditure of $2145 and a standard deviation of $569. The schools that scored above the PDE target (80-100) had a mean special education (1200) expenditure of $2,267 and standard deviation of $797.

After analyzing the special education (1200) expenditure data, the schools with scores between 70-79 had the lowest per pupil cost. The next lowest cost per student was from the schools scoring 80-100, followed by the low performing schools, which are spending the most in the special education (1200) variable.

**Per Pupil 1300**

The per pupil 1300 variable represents only the vocational education programs instructional costs (Pa Office of the Budget, 2018). In Table 6, the descriptive statistics identify the mean per pupil vocational education (1300) expenditures for all 499 school districts as $470 with a standard deviation of $263. Schools that did not meet the PDE Target Weighed SPP score (0-69) had a mean vocational education (1300) expenditure of $492 and a standard deviation of $243. Schools that met the PDE Target Weighted SPP score (70-79) had a mean vocational education (1300) expenditure of $501 and a standard deviation of $272. The schools that scored above the PDE target (80-100) had a mean vocational education (1300) expenditure of $343 and standard deviation of $238. Schools that met the expected score of 70 spent the most money, while underperforming

schools spent nearly as much. In the end, schools that spent the least per student amount on vocational education (1300) expenditures had the highest Weighted SPP scores.

Schools that met the SPP threshold of 70 spent the least in regular education (1100) and special education (1200) expenditures while they spent the most in vocational education (1300) expenditures. Schools that scored below the threshold spent the most money in the special education (1200) expenditures, while the schools that exceeded the level of performance spent the least per pupil on vocational education (1300) expenditures.

Table 6

*Per Pupil 1100, 1200 and 1300 Expenditures by W. SPP Range*

| SPP Range | N | % of Total N | Mean ($) | Std. Deviation ($) | Mean ($) | Std. Deviation ($) | Mean ($) | Std. Deviation ($) |
|---|---|---|---|---|---|---|---|---|
| | | | **1100** | **1100** | **1200** | **1200** | **1300** | **1300** |
| Below PDE Target (0-69) | 167 | 33.5 | 7,107 | 2,202 | 2,623 | 1,157 | 492 | 243 |
| At PDE Target (70-79) | 242 | 48.5 | 6,826 | 1,046 | 2,145 | 569 | 501 | 272 |
| Above PDE Target (80-100) | 90 | 18.0 | 7133 | 1,228 | 2,267 | 797 | 343 | 238 |
| Total | 499 | 100.0 | 6,975 | 1,561 | 2,327 | 873 | 470 | 263 |

## Per Pupil Support Services

The Per Pupil Support Services variable below is the total amount of money spent on support services that was reported on each school district's Annual Financial Report (AFR) submitted to the Pennsylvania Department of Education (PDE). This range of

expenditures begins with Pupil Personnel 2100 and ends with other support services (2900).

Table 7 provides descriptive statistics for the per pupil variables 2100 (expenditures in student support services), 2200 (expenditures in staff support services), and 2300 (administration support services expenditures, including n count, mean, and standard deviation). The table breaks down the descriptive statistics by Weighted SPP scores, which were below, at, and above the PDE target scores. At the bottom of the table, statistics are given for all 499 school districts in order to provide a comparison.

**Per Pupil 2100**

This variable represents only the pupil personnel support costs that focus on the supervision of student services, guidance services, counseling, psychological services, speech services, social work services, and student accounting (Pa Office of the Budget, 2018). In Table 7, the descriptive statistics identify the mean per pupil student support services (2100) expenditures for all schools as $518 with a standard deviation of $193. Schools that did not meet the PDE Target Weighted SPP score (0-69) had a mean student support services (2100) expenditure of $495 and a standard deviation of $225. Schools that met the PDE Target Weighted SPP score (70-79) had a mean student support services (2100) expenditure of $512 and a standard deviation of $174. The schools that scored above the PDE target (80-100) had a mean student support services (2100) expenditure of $577 and standard deviation of $167. Schools that spent money in this variable seemed to have a positive effect on meeting the PDE expected level of performance. Also, the schools that spent the least amount of money in this variable scored below the PDE expected level of performance.

## Per Pupil 2200

This variable represents support services instructional staff, technology support services, computer instruction support services, school library services, instruction and curriculum development services, and instructional staff development services, which are designated under the staff support services (2200) line item in pupil personnel support costs (Pa Office of the Budget, 2018). In Table 7, the descriptive statistics identify the mean per pupil (2200) staff support expenditures for all schools as $480 with a standard deviation of $264. Schools that did not meet the PDE Target Weighted SPP score (0-69) had a mean staff support services (2200) expenditure of $450 and a standard deviation of $261. Schools that met the PDE Target Weighted SPP score (70-79) had a mean staff support services (2200) expenditure of $492 and a standard deviation of $264. The schools that scored above the PDE target (80-100) had a mean student support services (2100) expenditure of $505 and standard deviation of $270. The spending and performance results are similar to the student support services (2100) variable. The schools that spent the most in variable staff support services (2200) exceeded the PDE expected level of performance. The schools that spent the least in staff support services (2200) did not meet the PDE expected level of performance.

## Per Pupil 2300

This variable represents administration costs, board services, tax collection, legal and accounting services, office of the superintendent, community relations, and office of principal services as reported to PDE each year (Pa Office of the Budget, 2018). In Table 7, the descriptive statistics identify the mean per pupil administration support services (2300) expenditures for all schools as $1,033 with a standard deviation of $259. Schools

that did not meet the PDE Target Weighted SPP score (0-69) had a mean administration support services (2300) expenditure of $1,052 and a standard deviation of $266. Schools that met the PDE Target Weighted SPP score (70-79) had a mean administration support services (2300) expenditure of $1,032 and a standard deviation of $270. The schools that scored above the PDE target (80-100) had a mean administration support services (2300) expenditure of $1,000 and standard deviation of $208. Schools that did not meet the PDE expected level of performance spent the most in this category. The schools that spent the least amount per pupil in this category reached the highest performance level.

Table 7

*Per Pupil 2100, 2200 and 2300 Expenditures by W. SPP Range*

| SPP Range | N | % of Total N | Mean ($) | Std. Deviation ($) | Mean ($) | Std. Deviation ($) | Mean ($) | Std. Deviation ($) |
|---|---|---|---|---|---|---|---|---|
| | | | **2100** | **2100** | **2200** | **2200** | **2300** | **2300** |
| Below PDE Target (0-69) | 167 | 33.5 | 495 | 225 | 450 | 261 | 1,052 | 266 |
| At PDE Target (70-79) | 242 | 48.5 | 512 | 174 | 492 | 264 | 1,032 | 270 |
| Above PDE Target (80-100) | 90 | 18.0 | 577 | 167 | 505 | 270 | 1,000 | 208 |
| Total | 499 | 100.0 | 518 | 193 | 480 | 264 | 1,033 | 259 |

## Per Pupil Total Expenditures

The Per Pupil Total Expenditures variable below is the total amount of money spent, which was reported on each school district's Annual Financial Report (AFR) submitted to the Pennsylvania Department of Education (PDE). This range of

expenditures includes everything from instruction and support services to administration, maintenance, and debt service.

Table 8 provides descriptive statistics for the variable Per Pupil Total Expenditures including n count, mean, and standard deviation. The table breaks down the descriptive statistics by Weighted SPP scores which were below, at, and above the PDE target scores. At the bottom of the table, statistics are given for all 499 school districts in order to provide a comparison.

In Table 8, the descriptive statistics identify the mean per pupil Total Expenditures for all schools as $17,590 with a standard deviation of $4,244. Schools that did not meet the PDE Target Weighted SPP score (0-69) had a mean expenditure of $18,122 and a standard deviation of $5,461. Schools that met the PDE Target Weighted SPP score (70-79) had a mean expenditure of $17,306 and a standard deviation of $3,539. The schools that scored above the PDE target (80-100) had a mean expenditure of $17,370 and standard deviation of $4,244. In the end, the schools that met or exceeded the PDE target spent less overall on a per-student basis than the schools that spent the most per student. Schools that did not meet the expected level spent more in special education (1200) and vocational education (1300) while schools that exceeded the expected level of performance spent more in 2100 and 2200 variables.

Table 8

*Per Pupil Total Expenditures by W. SPP Range*

| | N (Districts) | Mean ($) | Std. Deviation ($) |
|---|---|---|---|
| Below PDE Target (0-69) | 167 | 18,122 | 5,461 |
| At PDE Target (70-79) | 242 | 17,306 | 3,539 |
| Above PDE Target (80-100) | 90 | 17,370 | 3,233 |
| Total | 499 | 17,590 | 4,244 |

**Per Pupil Federal Funding**

The Per Pupil Federal Funding variable below is the total amount of federal money received and acknowledged on each school district's Annual Financial Report (AFR) submitted to the Pennsylvania Department of Education (PDE). This expenditure is derived from Federally Funded Regular Programs number 1190 line item.

Table 9 provides descriptive statistics for the variable Per Pupil Federal Funding including n count, mean, and standard deviation. The table breaks down the descriptive statistics by Weighted SPP scores which were below, at, and above the PDE target scores. At the bottom of the table, statistics are given for all 499 school districts in order to provide a comparison.

In Table 9, the descriptive statistics identify the mean per pupil Federal Funding expenditures for all schools as $196 with a standard deviation of $241. Schools that did not meet the PDE Target Weighted SPP score (0-69) had a mean expenditure of $281 and a standard deviation of $321. Schools that met the PDE Target Weighted SPP score (70-79) had a mean expenditure of $177 and a standard deviation of $191. The schools that scored above the PDE target (80-100) had a mean expenditure of $89 and standard

deviation of $91. School districts that receive more federal funding are not meeting the PDE expected levels of performance. The opposite is also true: The schools that receive the least federal funding perform above the PDE expected level of performance on the Weighted SPP score.

Table 9

*Per Pupil Federal Funding by W. SPP Range*

| | N (Districts) | Mean ($) | Std. Deviation ($) |
|---|---|---|---|
| Below PDE Target (0-69) | 167 | 281 | 321 |
| At PDE Target (70-79) | 242 | 177 | 191 |
| Above PDE Target (80-100) | 90 | 89 | 91 |
| Total | 499 | 196 | 241 |

## Special Education Decimal

The SPED Decimal variable represents the percentage of students receiving special education services in each school district. Each district reports its special education percentage to PDE every year.

In Table 10, the descriptive statistics identify the mean Special Education decimal as .1552, or 15.52 percent of all 499 school districts. School districts with a Weighted SPP score below the PDE Target (0-69) had a mean Special Education percentage of .1705. School districts that met the PDE target score (70-79) had a lower mean special education percentage of .1514, or 15.145 percent. School districts that had a Weighted SPP score above the PDE Target (80-100) had the lowest average special education population at .1372, or 13.72 percent. Table 10 shows an inverse relationship between the Weighted SPP Score and the special education percentage within school districts. As

the special education population increases, the Weighted SPP score falls below the PDE expected level of performance. In the end, lower percentages of special education students led to higher SPP Scores.

Table 10

*SPED Decimal by W. SPP Range*

| | N (Districts) | Mean (%) | Std. Deviation (%) |
|---|---|---|---|
| Below PDE Target (0-69) | 167 | .1705 | .02749 |
| At PDE Target (70-79) | 242 | .1514 | .03039 |
| Above PDE Target (80-100) | 90 | .1372 | .02893 |
| Total | 499 | .1552 | .03150 |

**Economically Disadvantaged Decimal**

The Economically Disadvantaged Decimal variable represents the percentage of students who qualify as economically disadvantaged in each school district. The economically disadvantaged rate is reported to PDE by each school district each year.

In Table 11, the descriptive statistics identify the mean Economically Disadvantaged Decimal as .4253, or 42.53 percent for all 499 school districts. School districts that had a Weighted SPP score below the PDE Target (0-69) had a mean special education percentage of .5563, or 55.64 percent. School districts that met the PDE target score (70-79) had a lower mean special education percentage of .4014, or 40.14 percent. School districts that had a Weighted SPP score above the PDE Target (80-100) had the lowest average economically disadvantaged population at .2465, or 24.65 percent. In Table 11, there is an inverse relationship between the Weighted SPP score and the economically disadvantaged percentage within school districts. As the economically

disadvantaged percentage increases, the Weighted SPP Score decreases. Lower percentages of economically disadvantaged students led to higher Weighted SPP Scores.

Table 11

*Econ Dis Decimal by W. SPP Range*

| | N (Districts) | Mean (%) | Std. Deviation (%) |
|---|---|---|---|
| Below PDE Target (0-69) | 167 | .5563 | .15734 |
| At PDE Target (70-79) | 242 | .4014 | .12169 |
| Above PDE Target (80-100) | 90 | .2465 | .13319 |
| Total | 499 | .4253 | .17435 |

**English Language Learner Decimal**

The English Language Learner (ELL) Decimal variable is the percentage of students in each school district that are identified as English Language Learners. The ELL rate is reported to PDE by each school district each year.

In Table 12, the descriptive statistics identify the mean English as a Learned Language decimal as .0129, or 1.29 percent for all 499 school districts. School districts that had a Weighted SPP score below the PDE Target (0-69) had a mean English as a Learned Language percentage of .0190, or 1.9 percent. School districts that met the PDE target score (70-79) had the lowest mean English as a Learned Language percentage of .0087, or .09 percent. School districts that had a Weighted SPP score above the PDE Target (80-100) had a higher average English as a Learned Language population of .0129, or 1.3 percent. The school districts with the lowest performance also had the highest percentage (.0190) of ELL students as part of their student body.

Table 12

*ELL Decimal by W. SPP Range*

| | N (Districts) | Mean (%) | Std. Deviation (%) |
|---|---|---|---|
| Below PDE Target (0-69) | 167 | .0190 | .03597 |
| At PDE Target (70-79) | 242 | .0087 | .01386 |
| Above PDE Target (80-100) | 90 | .0129 | .01770 |
| Total | 499 | .0129 | .02452 |

## Pearson Coefficients and Regression Analysis

After reviewing the descriptive statistics for the variables, a bivariate correlation was calculated between each dependent variable (Weighted SPP Score) and all other independent variables. The calculations were completed by using a two-tailed test that tests for both positive and negative correlations. Results of the bivariate calculations were considered significant at the .05 level or smaller. Each calculation was completed with a Pearson correlation score (listed below). Calculations that are considered significant are designated with an asterisk and accompanied by a notation providing further clarification if there is significant correlation at the .05, .01 or .001 level.

## Research Question #1

Is there a relationship between per pupil expenditures in instruction and SPP scores? To answer this question, instructional expenditures in the areas of 1100, 1200, and 1300 were reviewed. In Table 13, instructional expenditures were correlated to Weighted SPP Scores and also Weighted SPP Categories, providing insight into the school districts that scored below, at, or above the expected levels of PDE performance.

Pearson Correlations were calculated for all schools. In Table 13, the correlations were negative but showed a higher negative correlation with the Weighted SPP Score. There were three significant negative correlations associated with the Weighted SPP Score. The regular education (1100) instructional expenditures (Per Pupil 1100, r = -.125**), special education (1200) instructional expenditures (Per Pupil 1200, r = -.330**), and vocational education (Per Pupil 1300, r = -.100*) all demonstrated significant negative correlations to the Weighted SPP Score.

In addition, there were two negative correlations with the Weighted SPP Category. The special education (1200) instructional expenditures (Per Pupil 1200, r = -.179**) and vocational education (Per Pupil 1300, r = -.165**) demonstrated significant negative correlations to the Weighted SPP Category.

Table 13

*Pearson Correlations Between Instructional Variables*

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Per Pupil 1100 | 1.000 | | | | |
| Per Pupil 1200 | .691** | 1 | | | |
| Per Pupil 1300 | -.134** | -.038 | 1 | | |
| W. SPP Score | -.125** | -.330** | -.100* | 1 | |
| W. SPP Category | -.014 | -.179** | -.165** | .857** | 1 |

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).

In Table 14, a stepwise regression model is presented for the instructional expenditures associated with question 1. In Model 1, the special education (1200)

instructional expenditures ( $\beta$ = -.330 ) predicted 10.7 percent of the variance for Weighted. SPP scores.

Model 2 includes the variable regular education (1100) instructional expenditures ( $\beta$ = .196), which increases the predictive variance in SPP score to 12.5 percent. By adding regular education (1100) instructional expenditures to the model, the Beta value for special education (1200) instructional expenditures on the SPP score increased to -.465.

Model 3 then adds the variable vocational education (1300) expenditures ($\beta$ =-.094) to the regression model. This variable increases the predictability of the Weighted SPP Score to 13.2 percent. Model 3 defines all three variables, Per Pupil 1200 ( $\beta$ = -.455 ), Per Pupil 1100 ( $\beta$ = .176 ), and Per Pupil 1300 ( $\beta$ = -.094 ) with negative and positive Beta values, indicating that schools that spend more money in the special education (1200) and vocational education (1300) variables will have lower Weighted SPP Scores.

Table 14

*Stepwise Multiple Regression Models for W.SPP Scores and Instructional 1100, 1200, 1300 Expenditures*

| Independent Variables | Model 1 Per Pupil 1200 | | | Model 2 Per Pupil 1200, 1100 | | | Model 3 Per Pupil 1200, 1100, 1300 | | |
|---|---|---|---|---|---|---|---|---|---|
| | β | t | Sig | β | t | Sig | β | t | Sig |
| Model 1 | | | | | | | | | |
| Per Pupil 1200 | -.330 | -7.781 | .000*** | -.465 | -8.019 | .000*** | -.455 | -7.858 | .000*** |
| Model 2 | | | | | | | | | |
| Per Pupil 1200 | | | | | | | | | |
| Per Pupil 1100 | | | | .196 | 3.379 | .001** | .176 | -3.021 | .003** |
| Model 3 | | | | | | | | | |
| Per Pupil 1200 | | | | | | | | | |
| Per Pupil 1100 | | | | | | | -.094 | -2.228 | .026* |
| Per Pupil 1300 | | | | | | | | | |
| $R^2$ | .107 | | | .125 | | | .132 | | |
| $\Delta R$ in $R^2$ | | | | .018 | | | .007 | | |

*p < .05, **p < .01, ***p < .001

a. Predictors: (Constant), Per Pupil 1200

b. Predictors: (Constant), Per Pupil 1200, Per Pupil 1100

c. Predictors: (Constant), Per Pupil 1200, Per Pupil 1100, Per Pupil 1300

d. Dependent Variable: W. SPP Score

In Table 15, a stepwise regression model is presented for the instructional expenditures associated with question 1. In Model 1, the special education (1200) expenditures ( $\beta$ = -.179 ) predicted 3.0 percent of the variance Weighted SPP Categories.

Model 2 includes the variable vocational education (1300) expenditures ( $\beta$ = -.172 ), which increases the predictive variance in Weighted SPP Categories to 5.8 percent. By adding vocational education (1300) instructional expenditures to the model, the Beta value for special education (1200) instructional expenditures on the Weighted SPP Category increased to -.186.

Model 3 then adds the variable regular education (1100) expenditures ($\beta$ = .178) to the regression model. This variable increases the predictability of the Weighted SPP Category to 7.2 percent. Model 3 defines all three variables -- Per Pupil 1200 ( $\beta$ = -.308 ), Per Pupil 1300 ( $\beta$ = -.153 ), and Per Pupil 1100 ( $\beta$ = .178 ) -- with two of the three variables having negative Beta values, indicating that schools that spend more money in the special education (1200) and vocational education (1300) variables will be identified as schools having a lower Weighted SPP Category.

Table 15

*Stepwise Multiple Regression Models for W.SPP Categories and Instructional 1100, 1200, 1300 Expenditures*

| Independent Variables | Model 1 Per Pupil 1200 | | | Model 2 Per Pupil 1200, 1300 | | | Model 3 Per Pupil 1200, 1300, 1100 | | |
|---|---|---|---|---|---|---|---|---|---|
| | β | t | Sig | β | t | Sig | β | t | Sig |
| Model 1 | | | | | | | | | |
| Per Pupil 1200 | -.179 | -4.066 | .000*** | -.186 | -4.273 | .000*** | -.308 | -5.146 | .000*** |
| Model 2 | | | | | | | | | |
| Per Pupil 1200 | | | | | | | | | |
| Per Pupil 1300 | | | | -.172 | -3.956 | .000*** | -.153 | -3.501 | .001** |
| Model 3 | | | | | | | | | |
| Per Pupil 1200 | | | | | | | | | |
| Per Pupil 1300 | | | | | | | .178 | 2.945 | .003** |
| Per Pupil 1100 | | | | | | | | | |
| $R^2$ | .030 | | | .058 | | | .072 | | |
| $\Delta R$ in $R^2$ | | | | .028 | | | .014 | | |

*p < .05, **p < .01, ***p < .001

a. Predictors: (Constant), Per Pupil 1200

b. Predictors: (Constant), Per Pupil 1200, Per Pupil 1300

c. Predictors: (Constant), Per Pupil 1200, Per Pupil 1300, Per Pupil 1100

d. Dependent Variable: W. SPP CAT

**Correlations and Regressions by Small, Medium, and Large Sized Schools**

In addition to calculating correlations and regressions for all school districts in Pennsylvania, the same dependent variables of Weighted SPP Scores, Weighted SPP Categories, and independent variables of regular education (1100), special education (1200), and vocational (1300) expenditures were tested at three different enrollment sizes (small, medium, and large) of schools.

Pearson Correlations were calculated for "small" schools. In Table 16, the correlations were negative but had a higher negative correlation with the Weighted SPP Score. There were two significant negative correlations associated with the Weighted SPP Score. The regular education (1100) expenditures (Per Pupil 1100, r = -.305**) and special education (1200) expenditures (Per Pupil 1200, r = -.481**) both demonstrated significant negative correlations to the Weighted SPP Score.

In addition, there were two negative correlations with the Weighted SPP Category. The regular education (1100) expenditures (Per Pupil 1100, r = -.159) and special education (1200) expenditures (Per Pupil 1200, r = -.301**) both demonstrated significant negative correlations to the Weighted SPP Category.

Special education (1200) expenditures showed the highest correlation with Weighted SPP Scores (r = -.482**) in small schools. The correlations are reduced when tested against the Weighted SPP Categories. Small schools that spend more in regular education (1100) and special education (1200) had higher significant negative correlations.

Table 16

*Pearson Correlations Between Variables (Small Schools)*

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Per Pupil 1100 | 1 | | | | |
| Per Pupil 1200 | .719** | 1 | | | |
| Per Pupil 1300 | -.175* | -.088 | 1 | | |
| W. SPP Score | -.305** | -.481** | .135 | 1 | |
| W. SPP Category | -.159* | -.301** | .064 | .785** | 1 |

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).
a. Size of School=Small

In Table 17, a stepwise regression model is presented for the instructional expenditures in small schools associated with question 1. In Model 1, the special education (1200) expenditures ( $\beta$ = -.489 ) predicted 22.7 percent of the variance for Weighted. SPP scores. Since there is only one significant model with a negative Beta, it would indicate that spending more money in special education (1200) is associated with lower SPP Scores in small schools.

Table 17

*Stepwise Multiple Regression Models for W.SPP Scores and Instructional 1100, 1200, 1300 Expenditures (Small Schools)*

| Independent Variables | Model 1 Per Pupil 1200 | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Per Pupil 1200 | -481 | -7.106 | .000*** |
| $R^2$ | .227 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Small
b. Predictors: (Constant), Per Pupil 1200
c. Dependent Variable: W. SPP Score

In Table 18, a stepwise regression model is presented for the instructional expenditures in small schools associated with question 1. In Model 1, the special education (1200) expenditures ( $\beta$ = -.301 ) predicted 8.5 percent of the variance for Weighted SPP Categories. Since there is only one significant model with a negative Beta, it would indicate that spending more money in special education (1200) is associated with low-performing schools.

Table 18

*Stepwise Multiple Regression Models for W.SPP Categories and Instructional 1100, 1200, 1300 Expenditures (Small Schools)*

| Independent Variables | Model 1 Per Pupil 1200 | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Per Pupil 1200 | -301 | -4.088 | .000*** |
| $R^2$ | .085 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Small
b. Predictors: (Constant), Per Pupil 1200
c. Dependent Variable: W. SPP CAT

Pearson Correlations were calculated for "medium" schools. In Table 19, the correlations were significant, but correlations were higher in two out of the three variables with the Weighted SPP Score. There were two significant negative correlations associated with the Weighted SPP Score. The special education (1200) (Per Pupil 1200, r = -.293**) and vocational education (Per Pupil 1300, r = -.133*) expenditures all demonstrated significant negative correlations to the Weighted SPP Score. Even though it was not a significant number, it is worth noting that the regular education (1100) expenditures did have a positive correlation to Weighted SPP scores.

In addition, there was one positive correlation and two negative correlations with the Weighted SPP Category. The regular education (1100) expenditures (Per Pupil 1100, r = .146*), special education (1200) expenditures (Per Pupil 1200, r = -.161**), and vocational education expenditures (Per Pupil 1300, r = -.192**) demonstrated significant correlations to the Weighted SPP Category. The regular education (1100) expenditures

do not have a significant correlation to how students from medium school districts perform.

Table 19

*Pearson Correlations Between Variables (Medium Schools)*

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Per Pupil 1100 | 1 | | | | |
| Per Pupil 1200 | .693** | 1 | | | |
| Per Pupil 1300 | -.175** | -.049 | 1 | | |
| W. SPP Score | .074 | -.293** | -.133* | 1 | |
| W. SPP Category | .146* | -.161** | -.192** | .872** | 1 |

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).
a. Size of School=Medium

In Table 20, a stepwise regression model is presented for the instructional expenditures in medium schools associated with question 1. In Model 1, the special education (1200) expenditures ( $\beta$ = -.293 ) predicted 8.2 percent of the variance for the Weighted SPP score.

Model 2 includes the variable regular education (1100) expenditures ( $\beta$ = .534) in the regression model. This variable increases the predictability of the Weighted SPP Score to 22.8 percent and provides a positive association between regular education (1100) expenditures and Weighted SPP Scores. Model 2 defines both variables, Per Pupil 1200 ( $\beta$ = -.663 ) and Per Pupil 1100 ( $\beta$ = .534 ), with positive and negative Beta values; the data indicates that medium schools that spend more money in special education (1200) will have lower Weighted SPP Scores.

Table 20

Stepwise Multiple Regression Models for W.SPP Scores and Instructional 1100, 1200, 1300 Expenditures (Medium Schools)

| Independent Variables | Model 1 Per Pupil 1200 | | | Model 2 Per Pupil 1200, 1100 | | |
|---|---|---|---|---|---|---|
| | β | t | Sig | β | t | Sig |
| Model 1 | | | | | | |
| Per Pupil 1200 | -.293 | -4.916 | .000*** | -.663 | -8.750 | .000*** |
| Model 2 | | | | | | |
| Per Pupil 1200 | | | | | | |
| Per Pupil 1100 | | | | .534 | 7.050 | .000*** |
| $R^2$ | .082 | | | .228 | | |
| $\Delta R$ in $R^2$ | | | | .146 | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Medium
b. Predictors: (Constant), Per Pupil 1200
c. Predictors: (Constant), Per Pupil 1200, Per Pupil 1100
d. Dependent Variable: W. SPP Score

In Table 21, a stepwise regression model is presented for the instructional expenditures associated with question 1. In Model 1, the vocational education (1300) expenditures ( $\beta$ = -.192 ) predicted 3.3 percent of the variance in medium Weighted SPP Categories.

Model 2 includes the variable special education (1200) expenditures ( $\beta$ = -.171), which increases the predictive variance in Weighted SPP Categories to 5.9 percent. By adding special education (1200) expenditures to the model, the Beta value for vocational education (1300) expenditures on the SPP score increased to -.201.

Model 3 then adds the variable regular education (1100) expenditures ($\beta$ = .460) to the regression model. This variable increases the predictability of the Weighted SPP Score to 16.2 percent and provides a positive association between regular education

(1100) expenditures and Weighted SPP Categories. Model 3 defines all three variables – Per Pupil 1300 ($\beta$ = -.135), Per Pupil 1200 ( $\beta$ = -.487 ), and Per Pupil 1100 ( $\beta$ = .460 ) – with both negative and positive Beta values, indicating that medium schools that spend more money in vocational education (1300) and special education (1200) variables will have lower Weighted SPP Categories.

Table 21

*Stepwise Multiple Regression Models for W.SPP Categories and Instructional 1100, 1200, 1300 Expenditures (Medium Schools)*

| Independent Variables | Model 1 Per Pupil 1300 | | | Model 2 Per Pupil 1300, 1200 | | | Model 3 Per Pupil 1300, 1200, 1100 | | |
|---|---|---|---|---|---|---|---|---|---|
| | β | t | Sig | β | t | Sig | β | t | Sig |
| Model 1 | | | | | | | | | |
| Per Pupil 1300 | -.192 | -3.144 | .002** | -.201 | -3.322 | .001** | -.135 | -2.330 | .021* |
| Model 2 | | | | | | | | | |
| Per Pupil 1300 | | | | | | | | | |
| Per Pupil 1200 | | | | -.171 | -2.835 | .005** | -.487 | -6.130 | .000*** |
| Model 3 | | | | | | | | | |
| Per Pupil 1300 | | | | | | | | | |
| Per Pupil 1200 | | | | | | | .460 | 5.707 | .000*** |
| Per Pupil 1100 | | | | | | | | | |
| $R^2$ | .033 | | | .059 | | | .162 | | |
| $\Delta R$ in $R^2$ | | | | .026 | | | .103 | | |

*p < .05, **p < .01, ***p < .001

a. Size of School = Medium

b. Predictors: (Constant), Per Pupil 1300

b. Predictors: (Constant), Per Pupil 1300, Per Pupil 1200

c. Predictors: (Constant), Per Pupil 1300, Per Pupil 1200, Per Pupil 1100

d. Dependent Variable: W. SPP CAT

Pearson Correlations were calculated for "large" schools. In Table 22, the correlations were negative but showed a higher negative correlation with the Weighted SPP Score. There were two significant negative correlations associated with the Weighted SPP Score. The regular education (1200) expenditures (Per Pupil 1200, r = -.265*) and vocational education expenditures (Per Pupil 1300, r = -.271*) demonstrated significant negative correlations to the Weighted SPP Score.

In addition, there was one significant negative correlation with the Weighted SPP Category. Vocational education (Per Pupil 1300, r = -.261*) demonstrated a significant negative correlation to the Weighted SPP Category.

Table 22

Pearson Correlations Between Variables (Large Schools)

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Per Pupil 1100 | 1 | | | | |
| Per Pupil 1200 | .727** | 1 | | | |
| Per Pupil 1300 | .090 | .319** | 1 | | |
| W. SPP Score | -.111 | -.265* | -.271* | 1 | |
| W. SPP Category | -.026 | -.184 | -.261* | .893** | 1 |

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).
a. Size of School=Large

In Table 23, a stepwise regression model is presented for the instructional expenditures in large schools associated with question 1. In Model 1, the vocational education (1300) expenditures ( $\beta$ = -.271 ) predicted 5.9 percent of the variance for Weighted SPP scores. Since there is only one significant model with a negative Beta, it

would indicate that spending more money in the vocational education (1300) variable is associated with lower SPP Scores in large schools.

Table 23

*Stepwise Multiple Regression Models for W.SPP Scores and Instructional 1100, 1200, 1300 Expenditures (Large Schools)*

| Independent Variables | Model 1<br>Per Pupil 1300 | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Per Pupil 1300 | -271 | -2.300 | .025* |
| $R^2$ | .059 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Large
b. Predictors: (Constant), Per Pupil 1300
c. Dependent Variable: W. SPP Score

In Table 24, a stepwise regression model is presented for the instructional expenditures in small schools associated with question 1. In Model 1, the vocational education (1300) expenditures ( $\beta$ = -.261 ) predicted 5.4 percent of the variance for Weighted SPP Categories. Since there is only one significant model with a negative Beta, it would indicate that spending more money in the vocational education (1300) variable is associated with lower Weighted SPP Categories in large schools.

Table 24

*Stepwise Multiple Regression Models for W.SPP Categories and Instructional 1100, 1200, 1300 Expenditures (Large Schools)*

| Independent Variables | Model 1 Per Pupil 1300 | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Per Pupil 1300 | -261 | -2.209 | .031* |
| $R^2$ | .054 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Large
b. Predictors: (Constant), Per Pupil 1300
c. Dependent Variable: W. SPP CAT

**Research Question #2**

Is there a relationship between per pupil expenditures in support services and SPP scores? To answer this question, support service expenditures in the areas of student support services (2100), staff support services (2200), and administration support services (2300) were reviewed. Pearson Correlations were calculated for all schools. In Table 25, the correlations were both positive and negative but showed a higher positive correlation with the Weighted SPP Category. There was one significant positive and negative correlation associated with the Weighted SPP Score. The student support services (2100) expenditures (Per Pupil 2100, r = .109*) and administration support services (2300) expenditures (Per Pupil 2300, r = -.096*) demonstrated significant correlations to the Weighted SPP Score.

In addition, there was one positive correlation with the Weighted SPP Category. The 2100 student support service expenditures (Per Pupil 2100, r = .136**) demonstrated a significant positive correlation with the Weighted SPP Category.

Positive correlations are associated between supervision of student services, guidance services, counseling, psychological services, speech services, social work services, and student accounting and both Weighted SPP Scores and Weighted SPP Categories. Schools that spend money in these areas tend to have higher student performance.

Table 25

*Pearson Correlations Between Support Services Variables*

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Per Pupil 2100 | 1 | | | | |
| Per Pupil 2200 | .343** | 1 | | | . |
| Per Pupil 2300 | .207** | .264** | 1 | | |
| W. SPP Score | .109* | .079 | -.096* | 1 | |
| W. SPP Category | .136** | .078 | -.069 | .857** | 1 |

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).

In Table 26, a stepwise regression model is presented for the Support Service Expenditures in schools associated with question 2. In Model 1, the 2100 student support service expenditures ( $\beta$ = .109 ) predicted 1.0 percent of the variance for the Weighted SPP score.

Model 2 adds the variable 2300 administration support services ( $\beta$ = -.123) to the regression model. This variable increases the predictability of the Weighted SPP Score to 2.3 percent. Model 2 defines both variables, Per Pupil 2100 ( $\beta$ = .134 ) and Per Pupil 2300 ( $\beta$ = -.123 ), with positive and negative Beta values; the data indicate that schools

that spend more money in student support services (2100) will have higher Weighted SPP Scores.

Table 26

*Stepwise Multiple Regression Models for W.SPP Scores and Support Services 2100, 2200, 2300 Expenditures*

| Independent Variables | Model 1 Per Pupil 2100 | | | Model 2 Per Pupil 2100, 2300 | | |
|---|---|---|---|---|---|---|
| | β | t | Sig | β | t | Sig |
| Model 1 | | | | | | |
| Per Pupil 2100 | .109 | 2.434 | .015* | .134 | 2.962 | .003** |
| Model 2 | | | | | | |
| Per Pupil 2100 | | | | | | |
| Per Pupil 2300 | | | | -.123 | -.2.737 | .006** |
| $R^2$ | .010 | | | .023 | | |
| $\Delta R$ in $R^2$ | | | | .013 | | |

*p < .05, **p < .01, ***p < .001
a. Predictors: (Constant), Per Pupil 2100
c. Predictors: (Constant), Per Pupil 2100, Per Pupil 2300
d. Dependent Variable: W. SPP Score

In Table 27, a stepwise regression model is presented for the Support Service Expenditures in schools associated with question 2. In Model 1, the 2100 student support service expenditures ( $\beta$ = .136 ) predicted 1.7 percent of the variance in the Weighted SPP Category.

Model 2 adds the variable 2300 administration support services ( $\beta$ = -.101) to the regression model. This variable increases the predictability of the Weighted SPP Score to 2.4 percent. Model 2 defines both variables, Per Pupil 2100 ( $\beta$ = .157 ) and Per Pupil 2300 ( $\beta$ = -.101 ), with positive and negative Beta values. The data indicate that schools that spend more money in student support services (2100) will have higher Weighted SPP Categories.

Table 27

*Stepwise Multiple Regression Models for W.SPP Categories and Support Services 2100, 2200, 2300 Expenditures*

| Independent Variables | Model 1 Per Pupil 2100 | | | Model 2 Per Pupil 2100, 2300 | | |
|---|---|---|---|---|---|---|
| | β | t | Sig | β | t | Sig |
| Model 1 | | | | | | |
| Per Pupil 2100 | .136 | 3.068 | .002** | .157 | 3.477 | .001** |
| Model 2 | | | | | | |
| Per Pupil 2100 | | | | | | |
| Per Pupil 2300 | | | | -.101 | -2.238 | .026* |
| $R^2$ | .017 | | | .024 | | |
| $\Delta R$ in $R^2$ | | | | .007 | | |

*p < .05, **p < .01, ***p < .001
a. Predictors: (Constant), Per Pupil 2100
c. Predictors: (Constant), Per Pupil 2100, Per Pupil 2300
d. Dependent Variable: W. SPP CAT

**Correlations and Regressions by Small, Medium, and Large Sized Schools**

Pearson calculations were calculated for small, medium, and large school districts. Only medium-sized school districts returned significant correlations.

Pearson Correlations were calculated for "medium" schools. In Table 28, the correlations were positive but showed the highest positive correlation with the Weighted SPP Score. There were three significant positive correlations associated with the Weighted SPP Score. The 2100 student support service expenditures (Per Pupil 2100, r = .274**), 2200 staff support service expenditures (Per Pupil 2200, r = .161**), and 2300 administration support service expenditures (Per Pupil 2300, r = .135*) all demonstrated significant positive correlations to the Weighted SPP Score.

In addition, there were two positive correlations with the Weighted SPP Category. The 2200 staff support service expenditures (Per Pupil 2200, r = .231**) and 2300

administration support service expenditures (Per Pupil 2300, r = .157*) demonstrated significant positive correlations to the Weighted SPP Category.

Table 28

*Pearson Correlations Between Variables (Medium Schools)*

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Per Pupil 2100 | 1 | | | | |
| Per Pupil 2200 | .386** | 1 | | | |
| Per Pupil 2300 | .473** | .330** | 1 | | |
| W. SPP Score | .274** | .161** | .135* | 1 | |
| W. SPP Category | .231** | .115 | .157* | .872** | 1 |

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).
a. Size of School=Medium

In Table 29, a stepwise regression model is presented for the support service expenditures in medium schools associated with question 2. In Model 1, the 2100 student support services ( $\beta = .274$ ) predicted 7.2 percent of the variance Weighted SPP scores. Since there is only one significant model with a positive Beta, it would indicate that spending more money in the student support services (2100) variable is associated with higher SPP Scores in medium schools.

Table 29

*Stepwise Multiple Regression Models for W.SPP Scores and Support Services 2100, 2200, 2300 Expenditures (Medium Schools)*

| Independent Variables | Model 1 Per Pupil 2100 | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Per Pupil 2100 | .274 | 4.582 | .000*** |
| $R^2$ | .072 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Medium
b. Predictors: (Constant), Per Pupil 2100
c. Dependent Variable: W. SPP Score

In Table 30, a stepwise regression model is presented for the support service expenditures in medium schools associated with question 2. In Model 1, the 2100 student support services ( $\beta = .231$ ) predicted 5.0 percent of the variance for Weighted SPP Categories. Since there is only one significant model with a positive Beta, it would indicate that spending more money in the student support services (2100) variable is associated with higher student performance in medium schools.

Table 30

*Stepwise Multiple Regression Models for W.SPP Categories and Support Services 2100, 2200, 2300 Expenditures (Medium Schools)*

| Independent Variables | Model 1 Per Pupil 2100 | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Per Pupil 2100 | .231 | 3.816 | .000*** |
| $R^2$ | .050 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Medium
b. Predictors: (Constant), Per Pupil 2100
c. Dependent Variable: W. SPP CAT

**Research Question #3**

Is there a relationship between total per pupil expenditures and SPP scores? To answer this question, total per pupil expenditures were reviewed. In Table 31, total expenditures were correlated to Weighted SPP Scores as well as Weighted SPP Categories, which provided insight into the school districts that have scored below, at, or above the expected levels of PDE performance. There was a significant negative correlation (Per Pupil Total Expenditures, r = -.143**) associated with total expenditures and Weighted SPP Scores. A significant correlation did not exist between Per Pupil Total Expenditures and the Weighted SPP Category.

Table 31

*Pearson Correlations Between Total Expenditure Variables*

| | 1 | 2 | 3 |
|---|---|---|---|
| Per Pupil Total Expenditures | 1 | | |
| W. SPP Score | -.143** | 1 | |
| W. SPP Category | -.073 | .857** | 1 |

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).

In Table 32, a stepwise regression model is presented for the total expenditures in schools associated with question 3. In Model 1, the per pupil total expenditures ( $\beta$ = -.143 ) predicted 1.8 percent of the variance in Weighted SPP scores. Since there is only one significant model with a negative Beta, it would indicate that spending more money in the per pupil total expenditure variable is associated with lower SPP Scores.

Table 32

*Stepwise Multiple Regression Models for W.SPP Scores and Total Expenditures*

| Independent Variables | Model 1<br>Per Pupil Total Expenditures | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Per Pupil Total Expenditures | -.143 | -3.220 | .001** |
| $R^2$ | .018 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Predictors: (Constant), Per Pupil Total Expenditures
b. Dependent Variable: W. SPP Score

A stepwise regression model was performed to review the predictive effect that Per Pupil Total Expenditures have on the Weighted SPP Categories. The regression model did not show any significant relationships.

**Correlations and Regressions by Small, Medium, and Large Schools**

Pearson Correlations were calculated for "small" schools. In Table 33, the correlations were negative for both the Weighted SPP Score and Weighted SPP Category variables. There was a significant negative correlation associated with the Weighted SPP Score. The Weighted SPP Score and total spending (Per Pupil Total Funding, r = -.270**) demonstrated a negative correlation. The weighted SPP Score had a significant negative correlation of -.270**. The Weighted SPP Category and total expenditures (Per Pupil Total Funding, r = -.190*) also demonstrated a significant correlation in small schools. For small districts, spending in certain areas correlates with lower student performance.

Table 33

*Pearson Correlations Between Total Per Pupil Funding Variables (Small Schools)*

| | 1 | 2 | 3 |
|---|---|---|---|
| Per Pupil Total Funding | 1 | | |
| W. SPP Score | -.270** | 1 | |
| W. SPP Category | -.190* | .785** | 1 |

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).
a. Size of School = Small

In Table 34, a stepwise regression model is presented for the total expenditures in schools associated with question 3. In Model 1, the per pupil total expenditures ( $\beta$ = -

.270 ) predicted 6.8 percent of the variance in Weighted SPP scores. Since there is only one significant model with a negative Beta, it would indicate that spending more money in the per pupil total expenditure variable is associated with lower SPP Scores in small schools.

Table 34

*Stepwise Multiple Regression Models for W.SPP Scores and Per Pupil Total Expenditures (Small Schools)*

| Independent Variables | Model 1<br>Per Pupil Total Expenditures | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Per Pupil Total Expenditures | -.270 | -3.641 | .000*** |
| $R^2$ | .068 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Predictors: (Constant), Per Pupil Total Expenditures
b. Dependent Variable: W. SPP Score

In Table 35, a stepwise regression model is presented for the total expenditures in schools associated with question 3. In Model 1, the per pupil total expenditures ( $\beta$ = -.190 ) predicted 3.0 percent of the variance in Weighted SPP Categories. Since there is only one significant model with a negative Beta, it would indicate that spending more money in the per pupil total expenditure variable is associated with lower SPP Categories in small schools.

Table 35

*Stepwise Multiple Regression Models for W.SPP Categories and Per Pupil Total Expenditures (Small Schools)*

| Independent Variables | Model 1<br>Per Pupil Total Expenditures | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Per Pupil Total Expenditures | -.190 | -2.513 | .010* |
| $R^2$ | .030 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Predictors: (Constant), Per Pupil Total Expenditures
b. Dependent Variable: W. SPP CAT

A stepwise regression model was performed to review the predictive effect total expenditures have on the Weighted SPP Scores in medium and large school districts. Significant correlations did not exist at the medium and large school districts.

**Research Question #4**

Is there a relationship between per pupil federal expenditures and SPP scores? To answer this fourth question, federal expenditures were reviewed. In Table 36, federal expenditures were correlated to Weighted SPP Scores as well as Weighted SPP Categories, which provided insight into the school districts that have scored below, at, or above the expected levels of PDE performance. There was a significant negative correlation associated with the Weighted SPP Score. The Weighted SPP Score and Federal Funding (Per Pupil Federal Funding, r = -.428**) demonstrated a negative correlation. The weighted SPP Category and Federal Funding (Per Pupil Federal Funding, r = -.283**) also demonstrated a significant correlation in all schools. Schools

that receive higher per student amounts of federal funding are correlated with lower student performance.

Table 36

*Pearson Correlations Between Federal Funding Variables*

| | 1 | 2 | 3 |
|---|---|---|---|
| Per Pupil Federal Funding | 1 | | |
| W. SPP Score | -.428** | 1 | |
| W. SPP Category | -.283** | .857** | 1 |

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).

In Table 37, a stepwise regression model is presented for federal funding expenditures in schools associated with question 4. In Model 1, the Per Pupil Federal Funding ( $\beta$ = -.428 ) predicted 18.1 percent of the variance in Weighted SPP Scores. Since there is only one significant model with a negative Beta, it would indicate that receiving higher per pupil amounts of money in federal funding is associated with lower SPP Scores.

Table 37

*Stepwise Multiple Regression Models for W.SPP Scores and Federal Funding Expenditures*

| Independent Variables | Model 1<br>Per Pupil Federal Funding | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Per Pupil Federal Funding | -.428 | -10.551 | .000*** |
| $R^2$ | .181 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Predictors: (Constant), Per Pupil Federal Funding
b. Dependent Variable: W. SPP Score

In Table 38, a stepwise regression model is presented for federal funding expenditures in schools associated with question 4. In Model 1, the Per Pupil Federal Funding ( $\beta$ = -.283 ) predicted 7.8 percent of the variance in Weighted SPP Categories. Since there is only one significant model with a negative Beta, it would indicate that receiving higher per-pupil amounts of federal funding is associated with lower student performance.

Table 38

*Stepwise Multiple Regression Models for W.SPP Categories and Federal Funding Expenditures*

| Independent Variables | Model 1 Per Pupil Federal Funding | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Per Pupil Federal Funding | -.283 | -6.572 | .000*** |
| $R^2$ | .078 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Predictors: (Constant), Per Pupil Federal Funding
b. Dependent Variable: W. SPP CAT

**Correlations and Regressions by Small, Medium, and Large Schools**

In Table 39, federal expenditures were correlated to Weighted SPP Scores and also Weighted SPP Categories, which provided insight into the school districts that have scored below, at, or above the expected levels of PDE performance in small schools. There was a significant negative correlation associated with the Weighted SPP Score. The Weighted SPP Score and Federal Funding (Per Pupil Federal Funding, r = -.423**) demonstrated a negative correlation. The weighted SPP category and federal funding (Per Pupil Federal Funding, r = -.186*) also demonstrated a significant correlation in small schools.

Table 39

*Pearson Correlations Between Federal Funding Variables (Small Schools)*

| | 1 | 2 | 3 |
|---|---|---|---|
| Per Pupil Federal Funding | 1 | | |
| W. SPP Score | -.423** | 1 | |
| W. SPP Category | -.186* | .785** | 1 |

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).
a. Size of School = Small

In Table 40, a stepwise regression model is presented for federal funding expenditures in small schools associated with question 4. In Model 1, the Per Pupil Federal Funding ( $\beta$ = -.423 ) predicted 17.4 percent of the variance in Weighted SPP Scores. Since there is only one significant model with a negative Beta, it would indicate that receiving higher per pupil amounts of money in federal funding is associated with lower Weighted SPP Scores in small schools.

Table 40

*Stepwise Multiple Regression Models for W.SPP Scores and Federal Funding Expenditures (Small Schools)*

| Independent Variables | Model 1 Per Pupil Federal Funding | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Per Pupil Federal Funding | -.423 | -6.047 | .000*** |
| $R^2$ | .174 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Predictors: (Constant), Per Pupil Federal Funding
b. Dependent Variable: W. SPP Scores

In Table 41, a stepwise regression model is presented for federal funding expenditures in schools associated with question 4. In Model 1, the Per Pupil Federal Funding ( $\beta$ = -.186 ) predicted 2.9 percent of the variance in Weighted SPP Categories. Since there is only one significant model with a negative Beta, it would indicate that receiving higher per pupil amounts of money in federal funding is associated with lower Weighted SPP Categories. Out of the three sizes of schools, per student federal funding has the least effect on small schools.

Table 41

*Stepwise Multiple Regression Models for W.SPP Categories and Federal Funding Expenditures (Small Schools)*

| Independent Variables | Model 1<br>Per Pupil Federal Funding | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Per Pupil Federal Funding | -.186 | -2.449 | .015* |
| $R^2$ | .029 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Small
b. Predictors: (Constant), Per Pupil Federal Funding
c. Dependent Variable: W. SPP CAT

In Table 42, federal expenditures were correlated to Weighted SPP Scores and also Weighted SPP Categories, which provided insight into the school districts that have scored below, at, or above the expected levels of PDE performance in medium schools. There was a significant negative correlation associated with the Weighted SPP Score. The Weighted SPP Score and Federal Funding (Per Pupil Federal Funding, r = -.375**) demonstrated a negative correlation. The weighted SPP Category and Federal Funding

(Per Pupil Federal Funding, r = -.295**) also demonstrated a significant correlation in medium schools.

Table 42

*Pearson Correlations Between Federal Funding Variables (Medium Schools)*

| | 1 | 2 | 3 |
|---|---|---|---|
| Per Pupil Federal Funding | 1 | | |
| W. SPP Score | -.375** | 1 | |
| W. SPP Category | -.295** | .872** | 1 |

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).
a. Size of School = Medium

In Table 43, a stepwise regression model is presented for federal funding expenditures in medium schools associated with question 4. In Model 1, the Per Pupil Federal Funding ( $\beta$ = -.375 ) predicted 13.8 percent of the variance in Weighted SPP Scores. Since there is only one significant model with a negative Beta, it would indicate that receiving higher per-pupil amounts of money in federal funding is associated with lower Weighted SPP Scores in medium-sized schools.

Table 43

*Stepwise Multiple Regression Models for W.SPP Scores and Federal Funding Expenditures (Medium Schools)*

| Independent Variables | Model 1 Per Pupil Federal Funding | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Per Pupil Federal Funding | -.375 | -6.504 | .000*** |
| $R^2$ | .138 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Medium.
b. Predictors: (Constant), Per Pupil Federal Funding
c. Dependent Variable: W. SPP Scores

In Table 44, a stepwise regression model is presented for federal funding expenditures in schools associated with question 4. In Model 1, the Per Pupil Federal Funding ( $\beta$ = -.295 ) predicted 8.3 percent of the variance in Weighted SPP Categories. Since there is only one significant model with a negative Beta, it would indicate that receiving higher per pupil amounts of money in federal funding is associated with lower Weighted SPP Categories in medium-sized schools.

Table 44

*Stepwise Multiple Regression Models for W.SPP Categories and Federal Funding Expenditures (Medium Schools)*

| Independent Variables | Model 1 Per Pupil Federal Funding | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Per Pupil Federal Funding | -.295 | -4.956 | .000*** |
| $R^2$ | .083 | | |
| Δ*R* in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Medium
b. Predictors: (Constant), Per Pupil Federal Funding
c. Dependent Variable: W. SPP CAT

In Table 45, federal expenditures were correlated to Weighted SPP Scores and also Weighted SPP Categories, which provided insight into the school districts that have scored below, at, or above the expected levels of PDE performance in large schools. There was a significant negative correlation associated with the Weighted SPP Score. The Weighted SPP Score and Federal Funding (Per Pupil Federal Funding, r = -.661**) demonstrated a negative correlation. The weighted SPP Category and Federal Funding (Per Pupil Federal Funding, r = -.499**) also demonstrated a significant correlation in medium schools. Out of the three school sizes, per-student federal funding has the most effect on large schools.

Table 45

*Pearson Correlations Between Federal Funding Variables (Large Schools)*

| | 1 | 2 | 3 |
|---|---|---|---|
| Per Pupil Federal Funding | 1 | | |
| W. SPP Score | -.661** | 1 | |
| W. SPP Category | -.499** | .893** | 1 |

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).
a. Size of School = Large

In Table 46, a stepwise regression model is presented for federal funding expenditures in large schools associated with question 4. In Model 1, the Per Pupil Federal Funding ( $\beta$ = -.661 ) predicted 42.8 percent of the variance in Weighted SPP Scores. Since there is only one significant model with a negative Beta, it would indicate that receiving higher per pupil amounts of money in federal funding is associated with lower Weighted SPP Scores in large schools.

Table 46

*Stepwise Multiple Regression Models for W.SPP Scores and Federal Funding Expenditures (Large Schools)*

| Independent Variables | Model 1 Per Pupil Federal Funding | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Per Pupil Federal Funding | -.661 | -7.201 | .000*** |
| $R^2$ | .428 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Large
b. Predictors: (Constant), Per Pupil Federal Funding
c. Dependent Variable: W. SPP Scores

In Table 47, a stepwise regression model is presented for federal funding expenditures in schools associated with question 4. In Model 1, the Per Pupil Federal Funding ( $\beta$ = -.499 ) predicted 23.8 percent of the variance in Weighted SPP Categories. Since there is only one significant model with a negative Beta, it would indicate that receiving higher per pupil amounts of money in federal funding is associated with lower Weighted SPP Categories in large schools.

Table 47

*Stepwise Multiple Regression Models for W.SPP Categories and Federal Funding Expenditures (Large Schools)*

| Independent Variables | Model 1<br>Per Pupil Federal Funding | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Per Pupil Federal Funding | -.499 | -4.716 | .000*** |
| $R^2$ | .238 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Large
b. Predictors: (Constant), Per Pupil Federal Funding
c. Dependent Variable: W. SPP CAT

**Research Question #5**

Do other factors that are not financial in nature influence SPP scores?

a. Special Education Population

b. Economically Disadvantaged Population

c. English Language Learner Population

To answer this question, student population subgroups of Special Education, Economically Disadvantaged, and English Language Learner were reviewed. In Table 48, student subgroup percentages were correlated to Weighted SPP Scores and also

Weighted SPP Categories, which provided insight into the school districts that have scored below, at, or above the expected levels of PDE performance.

Pearson correlations were done for all schools. In Table 48, the correlations were negative but showed a higher negative correlation with the Weighted SPP Score. There were three significant negative correlations associated with the Weighted SPP Score. The percentage of Special Education Students (SPED Decimal, r = -.427**), Economically Disadvantaged Students (Econ Dis Decimal, r = -.763**), and English Language Learners (ELL, r = -.232**) all demonstrated significant negative correlations to the Weighted SPP Score.

In addition, there were three negative correlations with the Weighted SPP Category. The percentage of Special Education Students (SPED Decimal, r = -.378**), Economically Disadvantaged Students (Econ Dis Decimal, r = -.623**), and English Language Learners (ELL Decimal, r = -.119**) all demonstrated negative correlations with the Weighted SPP Category. The correlations for question 5 are some of the highest correlations among all of the research questions, and they are negatively correlated to the Weighted SPP Scores and Categories.

Table 48

*Pearson Correlations Between Non-Expenditure Variables*

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| SPED Decimal | 1 | | | | |
| Econ Dis Decimal | .452** | 1 | | | |
| ELL Decimal | .001 | .241** | 1 | | |
| W. SPP Score | -.427** | -.763** | -.232** | 1 | |
| W.SPPCat | -.378** | -.623** | -.119** | .857** | 1 |

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).

In Table 49, a stepwise regression model is presented for the non-expenditures variables associated with question 5. In Model 1, the Economically Disadvantaged Decimal ( $\beta$ = -.763 ) predicted 58.1 percent of the variance of Weighted SPP scores.

Model 2 includes the variable the SPED Decimal ( $\beta$ = -.104), which increases the predictive variance in SPP score to 58.9 percent. By adding the SPED Decimal to the model, the Beta value for the Economically Disadvantaged Decimal on the Weighted SPP score decreased to -.716.

Model 3 then adds the variable ELL Decimal ($\beta$ =-.064) to the regression model. This variable increases the predictability of the Weighted SPP Score to 59.2 percent. Model 3 defines all three variables, Economically Disadvantaged Decimal ( $\beta$ = -.697 ), SPED Decimal ( $\beta$ = -.113 ), and ELL Decimal ( $\beta$ = -.064 ), indicating that schools with higher decimals of Economically Disadvantaged, Special Education, and English as a Learned Language students will have significantly lower Weighted SPP Scores.

Table 49

*Stepwise Multiple Regression Models for W.SPP Scores and Non-Expenditure Variables*

| Independent Variables | Model 1<br>Econ Dis Decimal | | | Model 2<br>Econ Dis Decimal<br>SPED Decimal | | | Model 3<br>Econ Dis Decimal<br>SPED Decimal<br>ELL Decimal | | |
|---|---|---|---|---|---|---|---|---|---|
| | β | t | Sig | β | t | Sig | β | t | Sig |
| Model 1 | | | | | | | | | |
| Econ Dis Decimal | -.763 | -26.306 | .000*** | -.716 | -22.232 | .000*** | -.697 | -20.909 | .000*** |
| Model 2 | | | | | | | | | |
| Econ Dis Decimal | | | | | | | | | |
| SPED Decimal | | | | -.104 | -3.236 | .001** | -.113 | -3.489 | .001** |
| Model 3 | | | | | | | | | |
| Econ Dis Decimal | | | | | | | | | |
| SPED Decimal | | | | | | | -.064 | -2.139 | .033* |
| ELL Decimal | | | | | | | | | |
| $R^2$ | .581 | | | .589 | | | .592 | | |
| $\Delta R$ in $R^2$ | | | | .008 | | | .003 | | |

*p < .05, **p < .01, ***p < .001

a. Predictors: (Constant), Econ Dis Decimal

b. Predictors: (Constant), Econ Dis Decimal, SPED Decimal

c. Predictors: (Constant), Econ Dis Decimal, SPED Decimal, ELL Decimal

d. Dependent Variable: W. SPP Score

In Table 50, a stepwise regression model is presented for the non-expenditure variables associated with question 5. In Model 1, the Economically Disadvantaged Decimal ( $\beta$ = -.623 ) predicted 38.7 percent of the variance of Weighted SPP Categories.

Model 2 includes the variable the SPED Decimal ( $\beta$ = -.122), which increases the predictive variance in SPP score to 40.0 percent. Model 2 defines both variables, Economically Disadvantaged Decimal ( $\beta$ = -.568 ) and SPED Decimal ( $\beta$ = -.122 ), with negative Beta values, indicating that schools that have higher decimals of Economically Disadvantaged and Special Education students will have significantly lower Weighted SPP Categories.

Table 50

*Stepwise Multiple Regression Models for W.SPP Categories and Non-Expenditure Variables*

| Independent Variables | Model 1 Econ Dis Decimal | | | Model 2 Econ Dis Decimal SPED Decimal | | |
|---|---|---|---|---|---|---|
| | β | t | Sig | β | t | Sig |
| Model 1 | | | | | | |
| Econ Dis Decimal | -.623 | -17.769 | .000*** | -.568 | -14.583 | .000*** |
| Model 2 | | | | | | |
| Econ Dis Decimal | | | | | | |
| SPED Decimal | | | | -.122 | -3.123 | .002** |
| $R^2$ | .387 | | | .400 | | |
| $\Delta R$ in $R^2$ | | | | .013 | | |

*p < .05, **p < .01, ***p < .001
a. Predictors: (Constant), Econ Dis Decimal
b. Predictors: (Constant), Econ Dis Decimal, SPED Decimal
c. Dependent Variable: W. SPP CAT

**Correlations and Regressions by Small, Medium, and Large Sized Schools**

In addition to performing correlations and regressions for all school districts in Pennsylvania, the same dependent variables of Weighted SPP Score and Weighted SPP Categories, and independent variables of Econ Dis Decimal, SPED Decimal, and ELL Decimal were tested at three different enrollment sizes of schools.

Pearson correlations were calculated for small schools. In Table 51, the correlations were negative but showed a higher negative correlation with the Weighted SPP Score. There were three significant negative correlations associated with the Weighted SPP Score. The percentage of Special Education Students (SPED Decimal, r = -.294**), Economically Disadvantaged Students (Econ Dis Decimal, r = -.636**), and English Language Learners (ELL, r = -.217**) all demonstrated significant negative correlations to the Weighted SPP Score.

In addition, there were three negative correlations with the Weighted SPP Category. The percentage of Special Education Students (SPED Decimal, r = -.255**), Economically Disadvantaged Students (Econ Dis Decimal, r = -.386**), and English Language Learners (ELL Decimal, r = -.160*) all demonstrated negative correlations with the Weighted SPP Category.

Table 51

*Pearson Correlations Between Variables (Small Schools)*

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| SPED Decimal | 1 | | | | |
| Econ Dis Decimal | .339** | 1 | | | |
| ELL Decimal | .034 | .109 | 1 | | |
| W. SPP Score | -.294** | -.636** | -.217** | 1 | |
| W. SPP Category | -.255** | -.386** | -.160* | .785** | 1 |

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).
a. Size of School=Small

In Table 52, a stepwise regression model is presented for the non-expenditure variables associated with question 5 in small schools. In Model 1, the Economically Disadvantaged Decimal ( $\beta$ = -.636 ) predicted 40.2 percent of the variance of Weighted SPP scores.

Model 2 includes the variable the SPED Decimal ( $\beta$ = -.149), which increases the predictive variance in SPP score to 42.0 percent. Model 2 defines both variables, Economically Disadvantaged Decimal ( $\beta$ = -.620 ) and ELL Decimal ( $\beta$ = -.149 ), with negative Beta values, indicating that schools that have higher decimals of Economically Disadvantaged and English as a Learned Language students will have significantly lower Weighted SPP Scores in small schools.

Table 52

*Stepwise Multiple Regression Models for W.SPP Scores and Non-Expenditure Variables (Small Schools)*

| Independent Variables | Model 1 Econ Dis Decimal | | | Model 2 Econ Dis Decimal ELL Decimal | | |
|---|---|---|---|---|---|---|
| | β | t | Sig | β | t | Sig |
| Model 1 | | | | | | |
| Econ Dis Decimal | -.636 | -10.696 | .000*** | -.620 | -10.527 | .000*** |
| Model 2 | | | | | | |
| Econ Dis Decimal | | | | | | |
| ELL Decimal | | | | -.149 | -2.533 | .012* |
| $R^2$ | .402 | | | .420 | | |
| $\Delta R$ in $R^2$ | | | | .018 | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Small
b. Predictors: (Constant), Econ Dis Decimal
c. Predictors: (Constant), Econ Dis Decimal, ELL Decimal
d. Dependent Variable: W. SPP Score

In Table 53, a stepwise regression model is presented for the non-expenditure variables associated with question 5 in small schools. In Model 1, the Economically Disadvantaged Decimal ( $\beta$ = -.386 ) predicted 14.4 percent of the variance of Weighted SPP Categories. Since there is only one model and it has a negative Beta value, it indicates that schools that have higher decimals of Economically Disadvantaged will have significantly lower Weighted SPP Categories in small schools.

Table 53

*Stepwise Multiple Regression Models for W.SPP Categories and Non-Expenditure Variables (Small Schools)*

| Independent Variables | Model 1<br>Econ Dis Decimal | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Econ Dis Decimal | -.386 | -5.421 | .000*** |
| $R^2$ | .144 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Small
b. Predictors: (Constant), Econ Dis Decimal
c. Dependent Variable: W. SPP CAT

Pearson correlations were calculated for medium schools. In Table 54, the correlations were negative but showed a higher negative correlation with the Weighted SPP Score. There were two significant negative correlations associated with the Weighted SPP Score. The percentage of Special Education Students (SPED Decimal, r = -.497**) and Economically Disadvantaged Students (Econ Dis Decimal, r = -.731**) both demonstrated significant negative correlations to the Weighted SPP Score.

In addition, there were two negative correlations with the Weighted SPP Category. The percentage of Special Education Students (SPED Decimal, r = -.423**) and Economically Disadvantaged Students (Econ Dis Decimal, r = -.599**) both demonstrated negative correlations with the Weighted SPP Category.

Table 54

*Pearson Correlations Between Variables (Medium Schools)*

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| SPED Decimal | 1 | | | | |
| Econ Dis Decimal | .494** | 1 | | | |
| ELL Decimal | -.040 | .039 | 1 | | |
| W. SPP Score | -.497** | -.731** | -.004 | 1 | |
| W. SPP Category | -.423** | -.599** | -.013 | .872** | 1 |

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).
a. Size of School=Medium

In Table 55, a stepwise regression model is presented for the non-expenditure variables associated with question 5 in medium schools. In Model 1, the Economically Disadvantaged Decimal ( $\beta$ = -.731 ) predicted 53.3 percent of the variance of Weighted SPP Scores.

Model 2 includes the variable the SPED Decimal ( $\beta$ = -.180), which increases the predictive variance in SPP score to 55.6 percent. Model 2 defines both variables, Economically Disadvantaged Decimal ( $\beta$ = -.642 ) and SPED Decimal ( $\beta$ = -.180 ), with negative Beta values, indicating that schools that have higher decimals of Economically Disadvantaged and Special Education students will have significantly lower Weighted SPP Scores in medium-sized schools.

Table 55

*Stepwise Multiple Regression Models for W.SPP Scores and Non-Expenditure Variables (Medium Schools)*

| Independent Variables | Model 1 Econ Dis Decimal | | | Model 2 Econ Dis Decimal SPED Decimal | | |
|---|---|---|---|---|---|---|
| | β | t | Sig | β | t | Sig |
| Model 1 | | | | | | |
| Econ Dis Decimal | -.731 | -17.217 | .000*** | -.642 | -13.485 | .000*** |
| Model 2 | | | | | | |
| Econ Dis Decimal | | | | | | |
| SPED Decimal | | | | -.180 | -3.775 | .000*** |
| $R^2$ | .533 | | | .556 | | |
| $\Delta R$ in $R^2$ | | | | .023 | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Medium
b. Predictors: (Constant), Econ Dis Decimal
c. Predictors: (Constant), Econ Dis Decimal, SPED Decimal
d. Dependent Variable: W. SPP Score

In Table 56, a stepwise regression model is presented for the non-expenditure variables associated with question 5 in medium schools. In Model 1, the Economically Disadvantaged Decimal ( $\beta$ = -.599 ) predicted 35.6 percent of the variance of Weighted SPP Categories.

Model 2 includes the variable the SPED Decimal ( $\beta$ = -.168), which increases the predictive variance in SPP score to 37.5 percent. Model 2 defines both variables, Economically Disadvantaged Decimal ( $\beta$ = -.516 ) and SPED Decimal ( $\beta$ = -.168 ), with negative Beta values, indicating that schools that have higher decimals of Economically Disadvantaged and Special Education students will have significantly lower Weighted SPP Categories in medium-sized schools.

Table 56

*Stepwise Multiple Regression Models for W.SPP Categories and Non-Expenditure Variables (Medium Schools)*

| Independent Variables | Model 1 Econ Dis Decimal | | | Model 2 Econ Dis Decimal SPED Decimal | | |
|---|---|---|---|---|---|---|
| | β | t | Sig | β | t | Sig |
| Model 1 | | | | | | |
| Econ Dis Decimal | -.599 | -12.012 | .000*** | -.516 | -9.136 | .000*** |
| Model 2 | | | | | | |
| Econ Dis Decimal | | | | | | |
| SPED Decimal | | | | -.168 | -2.966 | .003** |
| $R^2$ | .356 | | | .375 | | |
| $\Delta R$ in $R^2$ | | | | .019 | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Medium
b. Predictors: (Constant), Econ Dis Decimal
c. Predictors: (Constant), Econ Dis Decimal, SPED Decimal
d. Dependent Variable: W. SPP CAT

Pearson correlations were calculated for large schools. In Table 57, the correlations were negative but showed a higher negative correlation with the Weighted SPP Score. There were three significant negative correlations associated with the Weighted SPP Score. The percentage of Special Education Students (SPED Decimal, r = -.355**), Economically Disadvantaged Students (Econ Dis Decimal, r = -.905**), and English Language Learners (ELL, r = -.726**) all demonstrated significant negative correlations to the Weighted SPP Score.

In addition, there were three negative correlations with the Weighted SPP Category. The percentage of Special Education Students (SPED Decimal, r = -.316**), Economically Disadvantaged Students (Econ Dis Decimal, r = -.805**), and English

Language Learners (ELL Decimal, r = -.533**) all demonstrated negative correlations with the Weighted SPP Category.

Table 57

*Pearson Correlations Between Variables (Large Schools)*

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| SPED Decimal | 1 | | | | |
| Econ Dis Decimal | .420** | 1 | | | |
| ELL Decimal | .211 | .762** | 1 | | |
| W. SPP Score | -.355** | -.905** | -.726** | 1 | |
| W. SPP Category | -.316** | -.805** | -.533** | .893** | 1 |

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).
a. Size of School=Large

In Table 58, a stepwise regression model is presented for the non-expenditure variables associated with question 5 in large schools. In Model 1, the Economically Disadvantaged Decimal ( $\beta$ = -.905 ) predicted 81.6 percent of the variance of Weighted SPP Scores. Since there is only one model and it has a negative Beta value, it indicates that schools with higher decimals of Economically Disadvantaged students will have significantly lower Weighted SPP Scores in large schools.

Table 58

*Stepwise Multiple Regression Models for W.SPP Scores and Non-Expenditure Variables (Large Schools)*

| Independent Variables | Model 1<br>Econ Dis Decimal | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Econ Dis Decimal | -.905 | -17.395 | .000*** |
| $R^2$ | .816 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Large
b. Predictors: (Constant), Econ Dis Decimal
c. Dependent Variable: W. SPP Score

In Table 59, a stepwise regression model is presented for the non-expenditure variables associated with question 5 in large schools. In Model 1, the Economically Disadvantaged Decimal ( $\beta$ = -.805 ) predicted 64.3 percent of the variance of Weighted SPP Categories. Since there is only one model and it has a negative Beta value, it indicates that schools that have higher decimals of Economically Disadvantaged students will have significantly lower Weighted SPP Categories in large schools.

Table 59

*Stepwise Multiple Regression Models for W.SPP Categories and Non-Expenditure Variables (Large Schools)*

| Independent Variables | Model 1<br>Econ Dis Decimal | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Econ Dis Decimal | -.805 | -11.117 | .000*** |
| $R^2$ | .643 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Large
b. Predictors: (Constant), Econ Dis Decimal
c. Dependent Variable: W. SPP CAT

**All Variables**

Research questions 1-5 were reviewed and data were analyzed to determine and identify any relationships that existed individually between the variables. In Table 60, all variables are assembled into one chart. Significant correlations exist, and themes are presented throughout the table.

Slight negative correlations exist for the instructional expenditures (1100, 1200, and 1300) and Weighted SPP Scores and Weighted SPP Categories. Significant negative correlations range from -.100* for vocational education (1300) expenditures to -.330** for special education (1200) instructional expenditures. Next, correlations were identified for student support services (2100), staff support services (2200), and administration support services (2300) variables and Weighted SPP Scores and Weighted SPP Categories. The student support services (2100) variables were slightly positive and ranged from .109* to .136*, while administration support services (2300) was negatively correlated (-.096) to the Weighted SPP Score. Significant correlations for Total

Expenditures increased in the negative direction. Correlations ranged from -.428 with Weighted SPP Scores to -.283 for Weighted SPP Categories. The Federal Expenditure variable had a significant negative correlation to Weighted SPP Score of -.143* while a significant correlation was not identified with Weighted SPP Categories. The most significant correlations occurred with the non-expenditure variables of Special Education, Economically Disadvantaged, and English Language Learners. Significant negative correlations ranged from -.119** for the ELL Decimal and Weighted SPP Categories to a significant high correlation of -.763** for Economically Disadvantaged students and Weighted SPP Scores.

Table 60

*Pearson Correlations All Variables*

| Model | W. SPP | SPP CAT | 1100 | 1200 | 1300 | 2100 | 2200 | 2300 | Total | Federal | SPED | ECON | ELL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W. SPP | 1 | | | | | | | | | | | | |
| SPP CAT | .857** | 1 | | | | | | | | | | | |
| 1100 | -.125** | -.014 | 1 | | | | | | | | | | |
| 1200 | -.330** | -.179** | .691** | 1 | | | | | | | | | |
| 1300 | -.100* | -.165** | -.134** | -.038 | 1 | | | | | | | | |
| 2100 | .109* | .136** | .588** | .467** | -.110* | 1 | | | | . | | | |
| 2200 | .079 | .078 | .369** | .230** | .052 | .343** | 1 | | | | | | |
| 2300 | -.096* | -.069 | .427** | .247** | .097* | .207** | .264** | 1 | | | | | |
| Total | -.428** | -.283** | .352** | .269** | .089* | .162** | .129** | .147** | 1 | | | | |
| Federal | -.143** | -.073 | .749** | .649** | .047 | .473** | .333** | .493** | .252** | 1 | | | |
| SPED | -.427** | -.378** | .168** | .365** | .192** | .105* | .094* | .213** | .225** | .275** | 1 | | |
| ECON | -.763** | -.623** | .052 | .202** | .174** | -.147** | -.104* | .117** | .488** | .097* | .452** | 1 | |
| ELL | -.232** | -.119** | .091* | .251** | -.089* | .171** | .014 | -.060 | .056 | .072 | .001 | .241** | 1 |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

In Table 61, a stepwise regression model is presented for all variables associated with questions 1-5. In Model 1, the Economically Disadvantaged Decimal ( $\beta$ = -.763 ) predicted 58.2 percent of the variance of Weighted SPP scores.

Model 2 includes the special education (1200) expenditures ( $\beta$ = -.183), which increases the predictive variance in SPP score to 61.4 percent. By adding the special education (1200) expenditures to the model, the Beta value for Economically Disadvantaged Decimal on the Weighted SPP score decreased to -.726.

Model 3 then adds the variable 2100 student support services ($\beta$ = .212) to the regression model. This variable increases the predictability of the Weighted SPP Score to 62.5 percent. Model 3 defines all three variables, Economically Disadvantaged Decimal ( $\beta$ = -.695 ), special education (1200) instructional expenses ( $\beta$ = -.246 ), and 2100 student support services ( $\beta$ = 121 ) with two of the three having negative Beta values. Schools that have higher decimals of Economically Disadvantaged and higher costs of special education (1200) expenses will have significantly lower Weighted SPP Scores.

Table 61

*Stepwise Multiple Regression Models for W.SPP Scores and all variables*

| Independent Variables | Model 1 Econ Dis Decimal | | | Model 2 Econ Dis Decimal Per Pupil 1200 | | | Model 3 Econ Dis Decimal Per Pupil 1200 Per Pupil 2100 | | |
|---|---|---|---|---|---|---|---|---|---|
| | β | t | Sig | β | t | Sig | β | t | Sig |
| Model 1 | | | | | | | | | |
| Econ Dis Decimal | -.763 | -26.306 | .000*** | -.726 | -25.487 | .000*** | -.695 | -23.756 | .000*** |
| Model 2 | | | | | | | | | |
| Econ Dis Decimal | | | | | | | | | |
| Per Pupil 1200 | | | | -.183 | -6.417 | .000*** | -.246 | -7.500 | .000*** |
| Model 3 | | | | | | | | | |
| Econ Dis Decimal | | | | | | | | | |
| Per Pupil 1200 | | | | | | | .121 | 3.742 | .000*** |
| Per Pupil 2100 | | | | | | | | | |
| $R^2$ | .582 | | | .614 | | | .625 | | |
| $\Delta R$ in $R^2$ | | | | .008 | | | .003 | | |

*p < .05, **p < .01, ***p < .001

a. Predictors: (Constant), Econ Dis Decimal

b. Predictors: (Constant), Econ Dis Decimal, Per Pupil 1200

c. Predictors: (Constant), Econ Dis Decimal, Per Pupil 1200, Per Pupil 2100

Research questions 1-5 were reviewed and data were analyzed in small school districts to determine and identify any relationships that existed individually between the variables. In Table 62, all variables are assembled into one chart for small schools. Similar to Table 60, significant correlations exist and themes are present throughout the table.

The effect of regular education (1100) and special education (1200) expenditures on Weighted SPP Scores and Weighted SPP Categories negatively increased for small schools when compared to Table 61 (all variables). The significant negative correlations range from -.159* for 1100 expenditures to -.481** for special education (1200) expenditures. Next, correlations did not exist for Support Services variables and Weighted SPP Scores and Weighted SPP Categories. Significant correlations for Total Expenditures were negative and similar to those seen in Table 60. Correlations ranged from -.423** with Weighted SPP Scores to -.186* for Weighted SPP Categories. The effect of the Federal Expenditure variable continued to show a negative correlation to Weighted SPP Score of -.270** and, unlike Table 60, shows a negative correlation with Weighted SPP Category of -.186*. The most significant correlations occurred with the non-expenditure variables of Special Education, Economically Disadvantaged, and English Language Learners. The SPED correlation decreased from Table 60 to that of small schools. Significant negative correlations ranged from -.294** (Weighted SPP Score) and -.255** (Weighted SPP Category). Finally, the effect of the ELL Decimal has a significant negative correlation on the Weighted SPP Score (-.217**) and Weighted SPP Category (-.260*).

Table 62

*Pearson Correlations All Variables (Small Schools)*

| Model | W. SPP | SPP CAT | 1100 | 1200 | 1300 | 2100 | 2200 | 2300 | Total | Federal | SPED | ECON | ELL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W. SPP | 1 | | | | | | | | | | | | |
| SPP CAT | .785** | 1 | | | | | | | | | | | |
| 1100 | -.305** | -.159* | 1 | | | | | | | | | | |
| 1200 | -.481** | -.301** | .719** | 1 | | | | | | | | | |
| 1300 | .135 | .064 | -.175* | -.088 | 1 | | | | | | | | |
| 2100 | -.096 | -.048 | .628** | .534** | -.126 | 1 | | | | | | | |
| 2200 | -.036 | .039 | .417** | .148 | .031 | .322** | 1 | | | | | | |
| 2300 | -.104 | -.067 | .373** | .197* | .070 | .111 | .262** | 1 | | | | | |
| Total | -.423** | -.186* | .616** | .528** | -.075 | .419** | .299** | .148 | 1 | | | | |
| Federal | -.270** | -.190* | .720** | .641** | .009 | .439** | .300** | .395** | .424** | 1 | | | |
| SPED | -.294** | -.255** | .258** | .365** | .150 | .194* | .212** | .241** | .162* | .362** | 1 | | |
| ECON | -.636** | -.386** | .299** | .407** | -.114 | .036 | .002 | .185* | .457** | .294** | .339** | 1 | |
| ELL | -.217** | -.160* | .020 | .326** | -.134 | .167* | -.107 | -.072 | .112 | .102 | .034 | .109 | 1 |

**. Correlation is significant at the 0.01 level (2-tailed)., *. Correlation is significant at the 0.05 level (2-tailed).
a. Size of School = Small

In Table 63, a stepwise regression model is presented for all variables associated with questions 1- 5 in small schools. In Model 1, the Economically Disadvantaged Decimal ( $\beta$ = -.636 ) predicted 40.2 percent of the variance of Weighted SPP Scores.

Model 2 includes the variable Per Pupil 2100 student support services expenditures ( $\beta$ = -.266), which increases the predictive variance in the Weighted SPP score to 45.8 percent. Model 2 defines both variables, Economically Disadvantaged Decimal ( $\beta$ = -.636 ) and Per Pupil 2100 student support services expenditures ( $\beta$ = -.266 ), with negative Beta values, indicating that schools that have higher decimals of Economically Disadvantaged and higher Per Pupil 2100 student support services expenditures will have significantly lower Weighted SPP Scores in small schools.

Table 63

*Stepwise Multiple Regression Models for W.SPP Scores and all variables (Small Schools)*

| Independent Variables | Model 1 Econ Dis Decimal | | | Model 2 Econ Dis Decimal Per Pupil 1200 | | |
|---|---|---|---|---|---|---|
| | β | t | Sig | β | t | Sig |
| Model 1 | | | | | | |
| Econ Dis Decimal | -.636 | -10.696 | .000*** | -.528 | -8.519 | .000*** |
| Model 2 | | | | | | |
| Econ Dis Decimal | | | | | | |
| Per Pupil 1200 | | | | -.266 | -4.286 | .000*** |
| $R^2$ | .402 | | | .458 | | |
| $\Delta R$ in $R^2$ | | | | .056 | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Small
b. Predictors: (Constant), Econ Dis Decimal
c. Predictors: (Constant), Econ Dis Decimal, Per Pupil 1200
d. Dependent Variable: W. SPP Score

In Table 64, a stepwise regression model is presented for all variables associated with questions 1- 5 in small schools. In Model 1, the Economically Disadvantaged Decimal ( $\beta$ = -.386) predicted 14.4 percent of the variance of Weighted SPP Categories.

Model 2 includes the variable Per Pupil 2100 student support service expenditures ( $\beta$ = -.172), which increases the predictive variance in the Weighted SPP Categories to 16.4 percent. Model 2 defines both variables, Economically Disadvantaged Decimal ($\beta$ = -.316 ) and Per Pupil 2100 student support services expenditures ( $\beta$ = -.172), with negative Beta values, indicating that schools that have higher decimals of Economically Disadvantaged and higher Per Pupil 2100 student support services expenditures will have significantly lower Weighted SPP Categories in small schools.

Table 64

*Stepwise Multiple Regression Models for W.SPP Categories and all variables (Small Schools)*

| Independent Variables | Model 1 Econ Dis Decimal | | | Model 2 Econ Dis Decimal Per Pupil 1200 | | |
|---|---|---|---|---|---|---|
| | β | t | Sig | β | t | Sig |
| Model 1 | | | | | | |
| Econ Dis Decimal | -.386 | -5.421 | .000*** | -.316 | -4.100 | .000*** |
| Model 2 | | | | | | |
| Econ Dis Decimal | | | | | | |
| Per Pupil 1200 | | | | -.172 | -2.238 | .000*** |
| $R^2$ | .144 | | | .164 | | |
| $\Delta R$ in $R^2$ | | | | .020 | | |

*p < .05, **p < .01, ***p < .001
a. Size of School = Small
b. Predictors: (Constant), Econ Dis Decimal
c. Predictors: (Constant), Econ Dis Decimal, Per Pupil 1200
d. Dependent Variable: W. SPP CAT

Research questions 1-5 were reviewed and data were analyzed to determine and identify any relationships that existed individually between the variables in medium school districts. Similar to Table 60, all variables were assembled into one chart and significant correlations exist.

Unlike Table 60, slight negative and positive correlations exist for the instructional expenditures (1100, 1200, and 1300) and Weighted SPP Scores and Weighted SPP Categories. A slight significant positive correlation was identified for regular education (1100) expenditures and Weighted SPP Categories. The special education (1200) expenditures continued to have a negative correlation and range from .161** (Weighted SPP Category) to -.293** (Weighted SPP Score). The vocational education (1300) expenditures negatively increased from to -.133* (Weighted SPP Score) and - .192** (Weighted SPP Category).

Next, correlations were identified for student support services (2100), staff support services (2200), and administration support services (2300) variables and Weighted SPP Scores and Weighted SPP Categories. The student support services (2100) variables positively increased from Table 60 and ranged from .231** (Weighted SPP Score) to .274** (Weighted SPP Category). The staff support services (2200) expenditures are positively correlated .161** for Weighted SPP Scores. The administration of support services (2300) expenditures are positively correlated at .135 (Weighted SPP Score) and .157 (Weighted SPP Category) for medium-sized school districts.

Correlations for total expenditures remained relatively similar from Table 60 and ranged from -.375** (Weighted SPP Scores) to -.295** (Weighted SPP Categories). Table 66 did not show any correlations between Federal Expenditures and medium-sized schools. The most significant correlations occurred with the non-expenditure variables of Special Education and Economically Disadvantaged. Significant negative correlations were similar to Table 60 for the SPED Decimal. Correlations ranged from -.497** (Weighted SPP Score) to -.423** (Weighted SPP Category). The most significant negative correlation of Table 66 was between the Economically Disadvantaged decimal (-.731**) and Weighted SPP Score. The second most negatively correlated number (-.599**) was between the Economically Disadvantaged decimal and Weighted SPP Categories. In the end, the ELL decimal did not have significant correlations in the Weighted SPP Score and Weighted SPP Category in medium-sized school districts.

Table 65

*Pearson Correlations All Variables (Medium Schools)*

| Model | W. SPP | SPP CAT | 1100 | 1200 | 1300 | 2100 | 2200 | 2300 | Total | Federal | SPED | ECON | ELL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W. SPP | 1 | | | | | | | | | | | | |
| SPP CAT | .872** | 1 | . | | | . | | | | | | | |
| 1100 | .074 | .146* | 1 | | | | | | | | | | |
| 1200 | -.293** | -.161** | .693** | 1 | | | | | | | | | |
| 1300 | -.133* | -.192** | -.175** | -.049 | 1 | | | | | | | | |
| 2100 | .274** | .231** | .554** | .380** | -.076 | 1 | | | | | | | |
| 2200 | .161** | .115 | .327** | .284** | .067 | .386** | 1 | | | | | | |
| 2300 | .135* | .157* | .508** | .362** | -.042 | .473** | .330** | 1 | | | | | |
| Total | -.375** | -.295** | -.066 | .056 | .215** | -.158* | -.042 | -.064 | 1 | | | . | |
| Federal | .035 | .084 | .780** | .687** | -.015 | .541** | .382** | .607** | -.064 | 1 | | | |
| SPED | -.497** | -.423** | .006 | .374** | .115 | .033 | -.005 | .031 | .249** | .122 | 1 | | |
| ECON | -.731** | -.599** | -.190** | .151* | .238** | -.275** | -.172** | -.203** | .503** | -.110 | .494** | 1 | |
| ELL | -.004 | -.013 | .185** | .247** | -.056 | .194** | .166** | .114 | -.138* | .181** | -.040 | .039 | 1 |

**. Correlation is significant at the 0.01 level (2-tailed)., *. Correlation is significant at the 0.05 level (2-tailed).
a. Size of School = Medium

In Table 66, a stepwise regression model is presented for all variables associated with questions 1-5 in medium schools. In Model 1, the Economically Disadvantaged Decimal ( $\beta$ = -.731 ) predicted 53.5 percent of the variance of Weighted SPP scores.

Model 2 includes the 1200 instructional expenditures ( $\beta$ = -.187), which increases the predictive variance in the Weighted SPP score to 56.9 percent. By adding the 1200 instructional expenditures to the model, the Beta value for the Economically Disadvantaged Decimal on the Weighted SPP score decreased to -.703.

Model 3 includes the 2100 support services ( $\beta$ = .205), which increases the predictive variance in the Weighted SPP score to 60.00 percent. By adding the 2100 support services expenditures to the model, the Beta value for the Economically Disadvantaged Decimal decreased to -.634 and the 1200 instructional expenditures to -.275 on the Weighted SPP Score.

Model 4 then adds the SPED Decimal variable ($\beta$ = -.133) to the regression model. This variable increases the predictability of the Weighted SPP Score to 61.2 percent. Model 4 defines all four variables, Economically Disadvantaged Decimal ( $\beta$ = -.572 ), 1200 Instructional Expenses ( $\beta$ = -.237 ), 2300 Support Services ( $\beta$ = .212), and SPED Decimal ( $\beta$ =-.133) with positive and negative Beta values. Model 4 indicates that schools with higher percentages of Economically Disadvantaged students, higher costs of 1200 Instructional Expenses, and higher percentages of Special Education students will have significantly lower Weighted SPP Scores in medium-sized schools.

Table 66

*Stepwise Multiple Regression Models for W.SPP Scores and all variables (Medium Schools)*

| Independent Variables | Model 1 Econ Dis Decimal | | | Model 2 Econ Dis Decimal Per Pupil 1200 | | | Model 3 Econ Dis Decimal Per Pupil 1200 Per Pupil 2100 | | | Model 4 Econ Dis Decimal Per Pupil 1200 Per Pupil 2100 SPED Decimal | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | t | Sig | β | t | Sig | β | t | Sig | β | t | Sig |
| Model 1 | | | | | | | | | | | | |
| Econ Dis Decimal | -.731 | -17.217 | .000*** | -.703 | -16.966 | .000*** | -.634 | -14.759 | .000*** | -.572 | -11.932 | 000*** |
| Model 2 | | | | | | | | | | | | |
| Econ Dis Decimal | | | | -.187 | -4.503 | .000*** | -.275 | -6.160 | .000*** | -.237 | -5.144 | .000*** |
| Per Pupil 1200 | | | | | | | | | | | | |
| Model 3 | | | | | | | | | | | | |
| Econ Dis Decimal | | | | | | | | | | | | |
| Per Pupil 1200 | | | | | | | | | | | | |
| Per Pupil 2100 | | | | | | | .205 | 4.461 | .000*** | .212 | 4.667 | .000*** |

(continued)

(continued)

| Independent Variables | Model 1 Econ Dis Decimal | Model 2 Econ Dis Decimal Per Pupil 1200 | Model 3 Econ Dis Decimal Per Pupil 1200 Per Pupil 2100 | Model 4 Econ Dis Decimal Per Pupil 1200 Per Pupil 2100 SPED Decimal | | |
|---|---|---|---|---|---|---|
| Model 4 | | | | | | |
| Econ Dis Decimal Per Pupil 1200 Per Pupil 2100 SPED Decimal | | | | -.133 | -2.775 | .006** |
| $R^2$ | .533 | .569 | .600 | .612 | | |
| $\Delta R$ in $R^2$ | | .056 | .031 | .012 | | |

*p < .05, **p < .01, ***p < .001

a. Size of School = Small

b. Predictors: (Constant), Econ Dis Decimal

c. Predictors: (Constant), Econ Dis Decimal, Per Pupil 1200

d. Predictors: (Constant), Econ Dis Decimal, Per Pupil 1200, Per Pupil 2100

e. Predictors: (Constant), Econ Dis Decimal, Per Pupil 1200, Per Pupil 2100, SPED Decimal

d. Dependent Variable: W. SPP Score

In Table 67, a stepwise regression model is presented for all variables associated with questions 1-5 in medium-sized schools. In Model 1, the Economically Disadvantaged Decimal ( $\beta$ = -.599 ) predicted 35.9 percent of the variance of Weighted SPP Categories.

Model 2 includes the SPED Decimal1200 ( $\beta$ = -.168), which increases the predictive variance in SPP score to 37.5 percent. By adding the SPED Decimal to the model, the Beta value for the Economically Disadvantaged Decimal on the Weighted SPP score decreased to -.516.

Model 3 then adds the variable student support services (2100) ($\beta$ = .107) to the regression model. This variable increases the predictability of the Weighted SPP Category to 39.0 percent. Model 3 defines all three variables, Economically Disadvantaged Decimal ( $\beta$ = -.475 ), 1200 SPED Decimal ( $\beta$ = -.191 ), and 2100 student support services ( $\beta$ = .107 ) with two out of the three variables having negative Beta values, indicating that schools that have higher decimals of Economically Disadvantaged and higher SPED Decimals will have significantly lower Weighted SPP Categories in medium-sized schools.

Table 67

*Stepwise Multiple Regression Models for W.SPP Categories and all variables (Medium Schools)*

| Independent Variables | Model 1<br>Econ Dis Decimal | | | Model 2<br>Econ Dis Decimal<br>SPED Decimal | | | Model 3<br>Econ Dis Decimal<br>SPED Decimal<br>Per Pupil 2100 | | |
|---|---|---|---|---|---|---|---|---|---|
| | β | t | Sig | β | t | Sig | β | t | Sig |
| Model 1 | | | | | | | | | |
| Econ Dis Decimal | -.599 | -12.012 | .000*** | -.516 | -9.136 | .000*** | -.475 | -7.973 | .000*** |
| Model 2 | | | | | | | | | |
| Econ Dis Decimal | | | | | | | | | |
| SPED Decimal | | | | -.168 | -2.966 | .003** | -.191 | -3.339 | .001** |
| Model 3 | | | | | | | | | |
| Econ Dis Decimal | | | | | | | | | |
| SPED Decimal | | | | | | | .107 | 2.062 | .040* |
| Per Pupil 2100 | | | | | | | | | |
| $R^2$ | .359 | | | .380 | | | .390 | | |
| $\Delta R$ in $R^2$ | | | | .021 | | | .010 | | |

*p < .05, **p < .01, ***p < .001

a. Size of School: Medium

b. Predictors: (Constant), Econ Dis Decimal

c. Predictors: (Constant), Econ Dis Decimal, SPED Decimal

d. Predictors: (Constant), Econ Dis Decimal, SPED Decimal, Per Pupil 2100

e. Dependent Variable: W. SPP CAT

Research questions 1-5 were reviewed and data were analyzed to determine and identify any relationships that existed individually between all variables in large school districts. In Table 68, all variables were assembled into one chart. Significant correlations exist and themes are present throughout the table.

Slight negative correlations exist for the instructional expenditures (1200 and 1300) and Weighted SPP Scores and Weighted SPP Categories. Significant negative correlations range from -.261* for special education (1200) expenditures to -.271** for vocational education (1300) instructional expenditures. Next, the support services variables did not yield any significant correlations in large schools. Significant correlations for Total Expenditures increased in the negative direction. Correlations ranged from -.661 (Weighted SPP Scores) to -.499 for (Weighted SPP Categories). The Federal Expenditure variable did not yield significant correlations. The most significant correlations occurred with the non-expenditure variables of Special Education, Economically Disadvantaged, and English Language Learners. Significant negative correlations ranged from -.316** for the SPED Decimal and SPP Categories to a significantly high correlation of -.905** for Economically Disadvantaged students and Weighted SPP Scores.

Table 68

*Pearson Correlations All Variables (Large Schools)*

| Model | W. SPP | SPP CAT | 1100 | 1200 | 1300 | 2100 | 2200 | 2300 | Total | Federal | SPED | ECON | ELL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W. SPP | 1 | | | | | | | | | | | | |
| SPP CAT | .893** | 1 | | | | | | | | | | | |
| 1100 | -.111 | -.026 | 1 | | | | | | | | | | |
| 1200 | -.265* | -.184 | .727** | 1 | | | | | | | | | |
| 1300 | -.271* | -.261* | .090 | .319** | 1 | | | | | | | | |
| 2100 | .120 | .185 | .557** | .484** | .042 | 1 | | | | | | | |
| 2200 | .094 | .069 | .400** | .360** | .045 | .366** | 1 | | | | | | |
| 2300 | -.235 | -.115 | .636** | .586** | .120 | .502** | .241* | 1 | | | | | |
| Total | -.661** | -.499** | -.023 | .125 | .133 | -.077 | -.130 | .284* | 1 | | | | |
| Federal | -.137 | -.067 | .794** | .802** | .315** | .607** | .419** | .675** | -.021 | 1 | | | |
| SPED | -.355** | -.316** | .297* | .486** | .438** | .230 | .136 | .241* | .272* | .316** | 1 | | |
| ECON | -.905** | -.805** | .018 | .183 | .232 | -.137 | -.162 | .182 | .709** | .003 | .420** | 1 | |
| ELL | -.726** | -.533** | .071 | .191 | .102 | .043 | -.098 | .199 | .576** | .047 | .211 | .762** | 1 |

**. Correlation is significant at the 0.01 level (2-tailed)., *. Correlation is significant at the 0.05 level (2-tailed).
a. Size of School = Large

In Table 69, a stepwise regression model is presented for all variables associated with questions 1-5 in large schools. In Model 1, the Economically Disadvantaged Decimal ( $\beta$ = -.905 ) predicted 81.6 percent of the variance of Weighted SPP Scores.

Model 2 includes the Per Pupil Total Expenditures variable ( $\beta$ = -.135), which increases the predictive variance in the Weighted SPP Score to 83.2 percent. By adding the Per Pupil Total Expenditures to the model, the Beta value for the Economically Disadvantaged Decimal on the Weighted SPP score decreased only slightly to -.904.

Model 3 then adds the 2100 student support services variable ($\beta$ = .126) to the regression model. This variable increases the predictability of the Weighted SPP Category to 84.7 percent. Model 3 defines all three variables, Economically Disadvantaged Decimal ( $\beta$ = -.887 ), Per Pupil Total Expenditures ( $\beta$ = -.211 ), and 2100 student support services ( $\beta$ = .126 ) with two of the three variables having significant negative Beta values, indicating that schools that have higher decimals of Economically Disadvantaged Students and higher Per Pupil Total expenditures will have significantly lower Weighted SPP Categories in large schools.

Table 69

*Stepwise Multiple Regression Models for W.SPP Scores and All Variables (Large Schools)*

| Independent Variables | Model 1 Econ Dis Decimal | | | Model 2 Econ Dis Decimal Per Pupil Total Expenditures | | | Model 3 Econ Dis Decimal Per Pupil Total Expenditures Per Pupil 2100 | | |
|---|---|---|---|---|---|---|---|---|---|
| | β | t | Sig | β | t | Sig | β | t | Sig |
| Model 1 | | | | | | | | | |
| Econ Dis Decimal | -.905 | -17.395 | .000*** | -.904 | -18.192 | .000*** | -.887 | -17.978 | .000*** |
| Model 2 | | | | | | | | | |
| Econ Dis Decimal Per Pupil Total Expenditures | | | | -.135 | -2.711 | .009** | -.211 | -3.438 | .001** |
| Model 3 | | | | | | | | | |
| Econ Dis Decimal Per Pupil Total Expenditures Per Pupil 2100 | | | | | | | .126 | 2.033 | .046* |
| $R^2$ | .816 | | | .832 | | | .847 | | |
| $\Delta R$ in $R^2$ | | | | .016 | | | .015 | | |

*p < .05, **p < .01, ***p < .001

(continued)

(continued)

a. Size of School: Large
b. Predictors: (Constant), Econ Dis Decimal
c. Predictors: (Constant), Econ Dis Decimal, Per Pupil Total Expenditures
d. Predictors: (Constant), Econ Dis Decimal, Per Pupil Total Expenditures, Per Pupil 2100
e. Dependent Variable: W. SPP Scores

In Table 70, a stepwise regression model is presented for all variables associated with questions 1-5 in large schools. In Model 1, the Economically Disadvantaged Decimal ( $\beta$ = -.805 ) predicted 64.8 percent of the variance of Weighted SPP Categories. Since there is only one model and it has a negative Beta value, it indicates that schools that have higher decimals of Economically Disadvantaged students will have significantly lower Weighted SPP Categories in large schools.

Table 70

*Stepwise Multiple Regression Models for W.SPP Categories and All Variables (Large Schools)*

| Independent Variables | Model 1<br>Econ Dis Decimal | | |
|---|---|---|---|
| | β | t | Sig |
| Model 1 | | | |
| Econ Dis Decimal | -.805 | -11.117 | .000*** |
| $R^2$ | .648 | | |
| $\Delta R$ in $R^2$ | | | |

*p < .05, **p < .01, ***p < .001
a. Size of School: Large
b. Predictors: (Constant), Econ Dis Decimal
c. Dependent Variable: W. SPP CAT

Chapter four consisted of identifying and calculating descriptive statistics, Pearson correlations, and multiple regression correlations including $R^2$ and $\Delta R$ in $R^2$ for five research questions. In addition, the data was categorized by each school district's enrollment size and also by the category in which the school district's score was identified (Below, At, and Above PDE expectation).

Question 1 identified significant positive predictive impacts in regular instruction (1100) for all and medium sized schools. In addition, variables with significant negative predictive impacts were identified. Special education expenditures (1200) in all, small,

and medium sized schools had negative predictive impacts on SPP scores, while Vocational education (1300) calculated a negative predictive impact on large sized schools.

Question 2 identified significant positive predictive impacts in student support services (2100) for all and medium sized schools. In addition, variables with significant negative predictive impacts were identified. Administrative support services expenditures (2300) had a negative predictive impact on SPP scores in all sized schools.

Question 3 did not identify a significant positive predictive impact in per pupil total expenditures. A significant negative predictive impact was identified for total expenditures in all and small sized schools.

Question 4 did not identify a significant positive predictive impact in per pupil federal expenditures. A significant negative predictive impact was identified for federal expenditures in all, small, medium, and large sized schools.

Question 5 did not identify significant positive predictive impacts in non-expenditure variables (percentage of students who participate in special education programs, who are considered to be economically disadvantaged, and English learners). Variables with significant negative predictive impacts were identified. The percentage of students who participate in special programs had a negative predictive impact in all and medium sized schools. Next, the percentage of students who are considered to be economically disadvantaged had the largest effect out of all the variables and had a negative predictive impact in all, small, medium, and large sized schools. Finally, the percentage of students who are considered to be English language learners had a negative predictive impact in all and small sized schools.

# CHAPTER FIVE

# SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

## Introduction

This chapter will detail and analyze findings from this study on Pennsylvania school districts and correlations between district spending and student performance. This study reviewed key budgetary expenses to determine if relationships or patterns existed between School Performance Profile (SPP) scores and school district expenditures. This study was organized by five research questions, the first four focusing on school district expenditures, and the fifth on non-expenditure variables that described the student population.

It is important for stakeholders to understand SPP scores and the relationships with economic and non-expenditure indicators. SPP scores reflect schools and communities, as school districts are comprised of people from the 499 geographical districts in Pennsylvania. As teachers, administrators, and school directors work to improve the student performance results (as required by legislative academic mandates), information about key correlations to SPP scores becomes crucial in making decisions that could impact student achievement.

The theoretical framework for this study was production theory. In production theory, inputs are measured against outputs to see if relationships exist. The inputs for this study were the independent variables, which were categorized and measured against the Weighted SPP Scores. The variables for this study included instructional, support service, federal, total expenditure, and non-expenditure variables and were correlated and analyzed through stepwise regression models.

## Summary of Research Findings

The average Weighted SPP Score for all 499 school districts was 72.39, with a low score of 41 and a high score of 92. The data were analyzed in several ways. First, the schools were categorized by enrollment so that school districts could be compared against similarly sized schools. School districts with enrollment between 0 and 1,499 students were categorized as "small." Thirty-four percent, or 170 schools, were assigned to this category. Next, school districts with student enrollment between 1,500 and 4,999 were categorized as "medium" sized schools. This group had the highest N count at 260, or 52.1 percent, of all the school districts that were part of the study. Lastly, school districts with student enrollment high than 5,000 students were categorized as "large" school districts. This group had the lowest N count at 69, or 13.8 percent of the total population of school districts.

School districts were not only categorized by student enrollment but also by the Weighted SPP Score each school had earned. School districts that scored below the PDE target of 70 comprised 33.5 percent of all schools and had an N count of 167. School districts that met the PDE target of 70 but did not reach a Weighted SPP score of 80 comprised 242 schools, or 48.5 percent of the total population. Lastly, the school districts that scored a Weighted SPP Score of 80 or above comprised 18 percent of the total population, or 90 school districts.

This study sought to find relationships and effects each variable had on small, medium, large and all schools. Table 71 represents a summary of the effects each variable has on Weighted SPP scores as a result of the Beta calculations through regression analysis. The variables that will likely increase Weighted SPP scores for all

schools are regular education and student support services expenditures. The remaining nine variables had a negative Beta score associated between them, which indicates that the higher the expenditure or higher the student population in those variables, the more likely lower Weighted SPP scores will result. The effects of the variables differed, as the schools were categorized by student enrollment size. For example, small schools did not calculate significant Beta coefficients for all variables. Rather, the special education, total, and federal expenditures were negative. Further, as the percentage of economically disadvantaged and English language learners increase, the more likely that small schools will have lower Weighted SPP scores. Medium-sized schools have a positive Beta coefficient for regular education and student support services, which, as a result, will likely see increased Weighted SPP scores. Further, negative Beta scores were calculated for medium schools in special education expenditures, federal expenditures, and the percentages of economically disadvantaged and English language learner students, indicating that a higher percentages in these variables will likely result in lower SPP scores. The range of variables that indicated a significant Beta score narrowed for large schools. Vocational education and federal expenditures, along with the percentage of economically disadvantaged students, are negatively associated with Weighted SPP scores, which indicates the higher the expenditure or higher the student population, the more likely lower SPP scores will result.

Table 71

*All Variables and All School Sizes*

| School Predictive Impact | Instructional Expenditures | Support Service Expenditures | Total Expenditures | Federal Expenditures | Non-Financial |
|---|---|---|---|---|---|
| **All Schools** Higher SPP | Regular Ed. | Student Sup. Services | | | |
| **All Schools** Lower SPP | Special Ed. Voc. Ed. | Admin. Sup. Serv. | Total Exp. | Federal Exp. | Econ Dis. SPED ELL |
| **Small** Higher SPP | | | | | |
| **Small** Lower SPP | Special Ed. | | Total Exp. | Federal Exp. | Econ Dis. ELL |
| **Medium** Higher SPP | Regular Ed. | Student Sup. Services | | | |
| **Medium** Lower SPP | Special Ed. | | | Federal Exp. | Econ Dis. SPED |
| **Large** Higher SPP | | | | | |
| **Large** Lower SPP | Voc. Ed. | | | Federal Exp. | Econ Dis. |

**Research Question #1**

Is there a relationship between per pupil Expenditures in instruction and SPP scores? The first research question reviewed the per student regular education (1100), special education (1200), and vocational education (1300) instructional expenditures. The regular education (1100) expenditures represent regular elementary and secondary K-12 program instructional costs, which can also include early intervening services. The special education (1200) expenditures represent special programs designed to support students with special needs, life skills, sensory support, emotional support, gifted, and

early intervention support costs. The vocational education (1300) expenditures represent only the vocational education program instructional costs.

**All Schools**

In Table 13, negative correlations were identified between Weighted SPP scores and all three instructional expenditures, with special education (1200) expenditures having the highest (r = -.330).

In Table 14, a stepwise regression model was performed for the instructional expenditures associated with question 1. In Model 1, the 1200 instructional expenditures ( $\beta$ = -.330 ) predicted 10.7 percent of the variance for Weighted SPP scores. Model 2 includes the variable 1100 instructional expenditures ( $\beta$ = .196), which, as a positive Beta, increases the predictive variance in SPP score to 12.5 percent. By adding 1100 instructional expenditures to the model, the Beta value for 1200 instructional expenditures on the SPP score increased to -.465. Model 3 then adds the variable 1300 instructional expenditures ($\beta$ =-.094) to the regression model. This variable increases the predictability of the Weighted SPP Score to 13.2 percent. Model 3 defines all three variables -- Per Pupil 1200 ( $\beta$ = -.455 ), Per Pupil 1100 ( $\beta$ = .176 ), and Per Pupil 1300 ( $\beta$ = -.094 ) – with negative and positive Beta values, indicating that schools that spend more money in the 1100 will more likely have positive Weighted SPP Scores, while schools with higher 1200 and 1300 variables are more likely to have lower Weighted SPP Scores.

In the end, regular education (1100), special education (1200), and vocational education (1300) expenditures predict 13.2 percent of the variance, while special education (1200) and vocational education (1300) had negative Betas, regular education

(1100) had a positive Beta associated with a Weighted SPP score earned by each school district.

**Small Schools**

In Table 16, the same data were calculated for small schools. This time, the correlations were negative for regular education (1100) and special education (1200) expenditures. The negative correlation for special education (1200) expenditures grew from -.330 for all schools to -.481 for small schools.

In Table 17, a stepwise regression model was performed for the instructional expenditures in small schools associated with question 1. In Model 1, the special education (1200) instructional expenditures ( $\beta$ = -.489 ) predicted 22.7 percent of the variance for Weighted. SPP scores.

The predictability of special education (1200) expenditures doubled for small schools, increasing from 10.7 percent in all schools to 22.7 percent of the variance in small schools. Due to the negative Beta ( $\beta$ = -.489 ), small schools that spend more money in special education (1200) expenditures are more likely to have lower weighted SPP scores.

**Medium Schools**

In Table 19, special education (1200) (r = -.293) and vocational education (1300) (r = -.133) expenditures have negative correlations with Weighted SPP scores. The instructional regression models for medium schools comprised two models. The vocational education (1300) expenditures that had a negative correlation (r = -.133) did not make the regression calculations and affect the predictability of the Weighted SPP score.

In Table 20, a stepwise regression model was performed for the instructional expenditures in medium schools associated with question 1. In Model 1, the special education (1200) instructional expenditures ( $\beta$ = -.293 ) predicted 8.2 percent of the variance of the Weighted SPP score. Model 2 includes the variable regular programs (1100) instructional expenditures ( $\beta$ = .534) in the regression model.

The regular education (1100) variable increases the predictability of the Weighted SPP Score to 22.8 percent and provides a positive association between 1100 expenditures and Weighted SPP Scores. Since the regular education (1100) expenditures had a positive Beta, medium-sized schools that spend more in regular education (1100) expenditures are more likely to have higher Weighted SPP scores. The predictability of the variance in this model is less for medium schools than for small schools. The predictability of 8.2 percent for special education (1200) expenditures more closely aligns to the predictability of all schools (3.0 percent) than that of small schools (22.7 percent). In the end, since the Beta is negative ( $\beta$ = -.663 ) for special programs (1200) expenditures, medium schools that spend more money in this variable are more likely to have lower SPP scores, while medium schools that spend more money in regular education (1100) ($\beta$ = .534) will more likely have higher SPP scores.

**Large Schools**

The theme thus far through question one is how much influence and predictability special education (1200) has on the Weighted SPP score. In large schools, the predictive impact of the variables changes. In Table 22, special education (1200) still has a negative correlation ( r = -.265), but vocational education (1300) expenditures show a higher negative correlation (r = -.271).

In Table 23, a stepwise regression model was performed for the instructional expenditures in large schools associated with question 1. In Model 1, the vocational education (1300) instructional expenditures ( $\beta$ = -.271 ) predicted 5.9 percent of the variance for Weighted SPP scores. Even though special education (1200) expenditures have a negative correlation, the expenditures do constitute a predictive role in the Weighted SPP scores in large schools. Due to the negative Beta ( $\beta$ = -.271 ), large schools that spend more in vocational education (1300) expenditures are more likely to have lower SPP scores.

**Summary of Findings for Research Question #1**

Now that the influence and predictability of the regular education (1100), special education (1200), and vocational education (1300) expenditures are known, the results must be compared to other studies that focused on student expenditures and student performance. Childs and Shakeshaft (1987) performed a meta data analysis reviewing 45 previous studies. The studies reviewed relationships between spending and student performance. Childs and Shakeshaft found that the outcomes were positive but minimal between spending and student achievement. The instructional costs in 12 of the 45 studies provided the largest predictive impact or variance on student performance, ranging from 6 to 9 percent.

Question #1 of this study reviewed three instructional expenditures. Regular instruction costs had a positive predictive impact on the W. SPP score similar to Childs and Shakeshaft. The instructional expenditures of regular education (1100), lead to higher student performance while special education (1200), and vocational education

(1300) did not lead to higher student performance as measured by the Weighted SPP score.

Ryan's (2012) study in Rhode Island schools demonstrated higher performance in reading, mathematics, and writing when additional per pupil expenses were made. The author had 10 independent variables, and direct instruction was the only one to have a positive effect on student performance. Even though some of the independent variables are similar, such as instructional costs, teacher support costs, and therapeutic costs, the outcomes are different from this study in Pennsylvania focusing on Weighted SPP scores. Terry (2011) found a weak relationship between the instructional expenditures and test scores in Texas public schools. Even though the study identified the relationships between student performance and instructional expenditures, it also clarified the definition of instructional expenses. Overall, the only data aligned to the Ryan (2012) study were the data results for medium-sized schools where regular instruction (1100) expenditures had a positive Beta of .534 in model 2 of Table 19. When reviewing the differences between this study and those of Childs and Shakeshaft (1987), Ryan (2012), and Terry (2011), one might question how closely related the assessments are. Does student achievement look the same in all the studies? Another factor to consider is the charter school structure in Pennsylvania, which requires school districts to pay for their students to attend those charter schools. The money spent on charter school tuition is not reflected in school districts' Weighted SPP scores. The charter school movement and its effect on Weighted SPP scores is outside the scope of the present study and is an area for future research.

The null hypothesis for question #1, There is no relationship between per pupil expenditures in instruction and SPP scores, is rejected. Given the data and research conducted on instructional expenditures in regular education (1100), special education (1200), and vocational education (1300), significant relationships were identified. Small and medium school districts that spend more money on special education (1200) are more likely to have lower SPP scores. Medium school districts that spend more money in regular education (1100) are more likely to have higher SPP scores. Lastly, large school districts that spend more money on vocational education (1300) expenditures are more likely to have lower Weighted SPP scores.

**Research Question #2**

Is there a relationship between per pupil expenditures in support services and SPP scores? The student support services (2100) expenditures represent the pupil personnel support costs that focus on the supervision of student services, guidance services, counseling, psychological services, speech services, social work services, and student accounting. The staff support services (2200) expenditures represent support services instructional staff, technology support services, computer instruction support services, school library services, instruction and curriculum development services, and instructional staff development services. The administration support services (2300) expenditures represent administration costs, board services, tax collection, legal and accounting services, office of the superintendent, community relations, and office of principal services for a school district as reported to PDE each year.

**All Schools**

In Table 25, a positive correlation (r = .109) was identified with student support services (2100) expenditures while a negative correlation (r = -.096) was identified for administration support services (2300) expenditures for all schools grouped together.

In Table 27, a stepwise regression model was performed for the Support Service Expenditures in schools associated with question 2. In Model 1, the student support services (2100) expenditures ( $\beta$ = .136 ) predicted 1.7 percent of the variance in the Weighted SPP Category. Model 2 adds the variable administration support services (2300) ( $\beta$ = -.101) to the regression model. This variable increases the predictability of the Weighted SPP Score to 2.4 percent. Model 2 defines both variables, student support services (2100) ( $\beta$ = .157 ) and administration support services (2300) ( $\beta$ = -.101 ), with positive and negative Beta values. In the end, student support services (2100) and administration support services (2300) expenditures predict 2.3 percent of the variance of the Weighted SPP score. According to the data, student support services (2100) expenditures are more likely to improve Weighted SPP scores, while administration support services (2300) expenditures are more likely to lower Weighted SPP scores.

**Medium Schools**

Calculations were performed for student support service (2100), staff support service (2200), and administration support services (2300) expenditures and small and large schools. Small and large schools did not have any significant correlations to the support services variables.

In Table 28, positive correlations were identified between medium schools and all three variables. Student support services (2100) had the highest correlation of r = .274.

Staff support services (2200) expenditures followed with an r = .161, while administration support services had a positive correlation of r = .135. In the regression calculations for Weighted SPP Score, the student support services (2100) expenditures was the only variable to be identified. In Table 29, a stepwise regression model was performed for the support service expenditures in medium schools associated with question 2. In Model 1, the student support services (2100) ( $\beta$ = .274 ) predicted 7.2 percent of the variance in Weighted SPP scores. The predictability of the student support services (2100) expenditures significantly increased in medium schools. The same variable for all schools was 1.0 percent. Since there is only one significant model with a positive Beta, it would indicate that medium schools that spend more money in the student support services (2100) variable are more likely to have higher SPP Scores.

**Summary of Findings for Research Question #2**

After reviewing the data associated with research question #2, it is clear that student support services (2100) expenditures have a positive predictability on Weighted SPP scores. Similar to the results in research question #1, the results of research question #2 must be compared to other studies. Ryan (2012) had similar results in question #1, as the only independent variable out of 10 to have a positive predictability was instructional expenses. This study yielded a similar result as the only two variables to have a positive predictability on Weighted SPP scores was the regular instruction (1100) and student support services (2100) expenditures. Ryan (2012) found that both teacher support and therapeutic support variables had a negative Beta or predictability for student achievement. Terry (2011) found a weak relationship between instructional expenditures and test scores in Texas public schools. Even though the study identified the relationships

between student performance and instructional expenditures, it also clarified the definition of instructional expenses. Terry (2011) included not only instructional expenses but also instructional aides and librarians, which would be considered support services in Pennsylvania. In the end, similar to this study, Terry (2011) found positive associations between expenditures and student performance.

Null Hypothesis 2, There is no relationship between per pupil expenditures in support services and SPP scores, is rejected. Given the data and research conducted on student support services (2100) and administration of support services (2300), the per student expenditures had significant correlations and predictability on weighted SPP scores. Medium-sized schools that spend more money in student support services (2100) are more likely to have higher SPP scores.

## Research Question #3

Is there a relationship between total per pupil expenditures and SPP scores? The third research question reviewed the per pupil total expenditures. The per pupil total expenditures variable represents the total amount of money a school district spends, divided by the number of students. This amount includes dollars that would be spent on instruction, support services, administration, transportation, sports, and building and grounds.

### All Schools

In Table 31, a negative correlation was identified between Weighted SPP scores and per pupil total expenditures (r = -.143). In Table 32, a stepwise regression model was performed for the total expenditures in schools associated with question 3. In Model 1, the per pupil total expenditures ( $\beta$ = -.143 ) predicted 1.8 percent of the variance in

Weighted SPP scores. Since there is only one significant model with a negative Beta, it would indicate that schools that spend more money in the per pupil total expenditure variable are more likely to have lower SPP scores. Given the research on production theory, this outcome was not expected and further research is required to better understand the outcome.

**Small Schools**

In Table 33, the same data that were calculated for all schools was only calculated for small schools. A negative correlation (r = -.270) was identified between Weighted SPP scores and per pupil total expenditures.

In Table 34, a stepwise regression model was performed for the total expenditures in schools associated with question 3. In Model 1, the per pupil total expenditures ( $\beta$ = -.270 ) predicted 6.8 percent of the variance in Weighted SPP scores. Since there is only one significant model with a negative Beta, it would indicate that small schools that spend more money in the per pupil total expenditure variable are more likely to have lower SPP Scores.

In comparison, small schools are affected at a higher rate by per pupil total expenditures than all schools combined. When the regression calculations were performed, per pupil total expenditures predicted 1.8 percent of the variance in the Weighted SPP score, while in small schools the predictive number increases to 6.8 percent of the variance. Per pupil total expenditures affect small schools at an increased rate when compared to all other schools combined. Finally, in reviewing the data for medium and large schools, the correlational analysis and regression models did not find significant relationships.

## Summary of Findings for Research Question #3

The results of the data for Question #3 align with the research done by Eric Hanushek, who argued for decades that increased funding in education does not automatically lead to higher student achievement. Bruce Baker (2016) responded to some of Hanushek's work and premises and argued that money *is* associated with higher student outcomes, and strategies such as additional supports and competitive salaries are associated with higher student outcomes. In the end, the findings of this study more closely align to those of Eric Hanushek except for regular education (1100) expenditures in medium-sized schools and student support services (2100) expenditures.

Null Hypothesis 3, There is no relationship between total per pupil expenditures and SPP scores, is rejected. Given the data and research conducted on per pupil total expenditures, significant relationships were found. Small schools that have higher per pupil total expenditures are more likely to have lower SPP scores.

## Research Question #4

Is there a relationship between the amount of federal dollars a school district receives and SPP scores? The fourth research question reviewed per pupil federal expenditures. The per pupil federal expenditures variable represents the amount of federal funding dollars a school district receives divided by the number of students.

### All Schools

In Table 36, a negative correlation (r = -.428) was identified between Weighted SPP scores and per pupil federal expenditures. In Table 37, a stepwise regression model is performed for federal funding expenditures in schools associated with question 4. In Model 1, Per Pupil Federal Expenditures ( $\beta$ = -.428 ) predicted 18.1 percent of the

variance in Weighted SPP Scores. Since there is only one significant model with a negative Beta, it would indicate that receiving higher per pupil amounts of money in federal funding is associated with lower SPP Scores. Schools that qualify for federal dollars are related to the non-expenditure variables (economically disadvantaged students) in research question #5. The outcomes in both research questions show negative associations to the Weighted SPP score. In the end, schools that have higher federal expenditures will likely have lower Weighted SPP scores.

**Small Schools**

In Table 39, a negative correlation (r = -.423) was identified between Weighted SPP scores and per pupil federal expenditures in small schools. In Table 40, a stepwise regression model is performed for federal funding expenditures in small schools. In Model 1, the Per Pupil Federal Funding ( $\beta$ = -.423 ) predicted 17.4 percent of the variance in Weighted SPP Scores. Since there is only one significant model with a negative Beta, it would indicate that small schools that receive higher per pupil amounts of money in federal funding are more likely to have lower SPP Scores. The variable of per pupil federal expenditures is similar to all schools when reviewing correlations and Beta values.

**Medium Schools**

In Table 42, a negative correlation (r = -.375) was identified between Weighted SPP scores and per pupil federal expenditures in medium schools. In Table 43, a stepwise regression model is performed for federal funding expenditures in medium schools. In Model 1, the Per Pupil Federal Funding ( $\beta$ = -.375 ) predicted 13.8 percent of the variance in Weighted SPP Scores. Since there is only one significant model with a

negative Beta, it would indicate that medium schools that receive higher per pupil amounts of money in federal funding are more likely to have lower SPP Scores. Per pupil federal expenditures have less of an effect on medium-size schools than smaller schools. The negative correlations and Beta values are less for medium schools when compared to small schools.

**Large Schools**

In Table 45, a negative correlation (r = -.661) was identified between Weighted SPP scores and per pupil federal expenditures in large schools. In Table 46, a stepwise regression model is performed for federal funding expenditures in large schools. In Model 1, the Per Pupil Federal Funding ( $\beta$ = -.661 ) predicted 42.8 percent of the variance in Weighted SPP Scores. Since there is only one significant model with a negative Beta, it would indicate that receiving higher per pupil amounts of money in federal funding is associated with lower SPP Scores in large schools. Per pupil federal expenditures nearly triple the effect on large schools. The negative correlations and Beta values significantly increase for large schools when compared to small, medium, and all schools reviewed as a group.

**Summary of Findings for Research Question #4**

The federal dollars a school district receives comes to schools via various title programs (i.e., Title I for special education). Therefore, schools (usually elementary schools) are often differentiated between title and non-title schools. If a school receives federal dollars, it is considered a title school (Heier, 2011). Heier (2011) found that students who attended non-title schools in Texas had higher student outcomes than did students who attended title schools. Similar to Heier (2011), Arrington (2010) conducted

a study in Illinois and compared several independent variables to student performance. She found a negative association between title schools, or those that receive federal funding, and non-title school that do not receive federal funding. This research would align with the premise that there are negative correlations associated between Weighted SPP Scores and Per Pupil Federal Expenditures, which was the result of this study with SPP scores in Pennsylvania.

Null Hypothesis 4, There is no relationship between per pupil expenditures and federal dollars received by the district and SPP scores, is rejected. Given the data and research on per pupil federal expenditures, significant relationships were found. Overall, schools that spend more on per pupil federal expenditures are more likely to have lower SPP Scores.

**Research Question #5**

Do other factors that are not financial in nature influence SPP scores? The variables that had the most influence on Weighted SPP scores in this study were the non-expenditure percentages of certain populations of students. Compared to the previous research questions, the predictability within the regression analysis increased dramatically for research question 5. In Table 48, negative correlations were identified between the Weighted SPP score and the percentage of special education students ($r = -.427$), the percentage of economically disadvantaged students ( $r = -.763$), and the percentage of English language learners ( $r = -.232$).

In Table 49, a stepwise regression model is performed for the non-expenditure variables associated with question 5. In Model 1, the Economically Disadvantaged Decimal ( $\beta = -.763$ ) predicted 58.1 percent of the variance of Weighted SPP scores.

Model 2 includes the variable the SPED Decimal ( $\beta$ = -.104), which increases the predictive variance in SPP score to 58.9 percent. By adding the SPED Decimal to the model, the Beta value for the Economically Disadvantaged Decimal on the Weighted SPP score decreased to -.716. Model 3 then adds the variable ELL Decimal ($\beta$ =-.064) to the regression model. This variable increases the predictability of the variance in Weighted SPP Score to 59.2 percent. Model 3 defines all three variables, Economically Disadvantaged Decimal ( $\beta$ = -.697 ), SPED Decimal ( $\beta$ = -.113 ), and ELL Decimal ( $\beta$ = -.064 ) with negative Beta values, indicating that schools with higher percentages of Economically Disadvantaged, Special Education, and English as a Learned Language students are more likely to have significantly lower Weighted SPP Scores.

**Small Schools**

When reviewing all three sizes of schools, the negative effect of the non-expenditure variables is the least in small schools. In Table 51, negative correlations were identified between the Weighted SPP score and the percentage of special education students (r = -.294), the percentage of economically disadvantaged students ( r = -.636), and the percentage of English language learners ( r = -.217).

In Table 52, a stepwise regression model is performed for the non-expenditure variables associated with question 5 in small schools. In Model 1, the Economically Disadvantaged Decimal ( $\beta$ = -.636 ) predicted 40.2 percent of the variance of Weighted SPP scores. Model 2 includes the variable the SPED Decimal ( $\beta$ = -.149), which increases the predictive variance in the SPP score to 42.0 percent. Model 2 defines both variables, Economically Disadvantaged Decimal ( $\beta$ = -.620 ) and ELL Decimal ( $\beta$ = -.149 ), with negative Beta values, indicating that small schools that have higher decimals

of Economically Disadvantaged and English as a Learned Language students are more likely to have significantly lower Weighted SPP scores.

**Medium Schools**

In Table 54, negative correlations were identified between the Weighted SPP score and the percentages of special education students (r = -.497) and economically disadvantaged students ( r = -.731). In Table 55, a stepwise regression model is performed for the non-expenditure variables associated with question 5 in medium schools. In Model 1, the Economically Disadvantaged Decimal ( $\beta$ = -.731 ) predicted 53.3 percent of the variance of Weighted SPP Scores. Model 2 includes the variable of the SPED Decimal ( $\beta$ = -.180), which increases the predictive variance in the SPP score to 55.6 percent. Model 2 defines both variables, Economically Disadvantaged Decimal ( $\beta$ = -.642 ) and SPED Decimal ( $\beta$ = -.180 ), with negative Beta values, indicating that medium schools that have higher percentages of Economically Disadvantaged and special education students are more likely to have significantly lower Weighted SPP scores.

**Large Schools**

When reviewing all three sizes of schools, the negative effect of the non-expenditure variables is the highest in large schools. In Table 57, negative correlations were identified between the Weighted SPP score and the percentage of special education students (r = -.355), the percentage of economically disadvantaged students ( r = -.905), and the percentage of English language learners ( r = -.726).

In Table 58, a stepwise regression model is performed for the non-expenditure variables associated with question 5 in large schools. In Model 1, the Economically Disadvantaged Decimal ( $\beta$ = -.905 ) predicted 81.6 percent of the variance of Weighted

SPP Scores. Since there is only one model, and it has a negative Beta value, it indicates that large schools with higher percentages of economically disadvantaged students are more likely to have significantly lower Weighted SPP Scores.

**Summary of Findings for Research Question #5**

The percentage of economically disadvantaged students has the most predictive impact on the Weighted SPP Scores. The outcomes of this study align with previous studies. For example, Baker (2015) performed a study in 2009-2010 in Virginia and found a significant relationship between student performance and students who are considered to be economically disadvantaged. Similar to this study, Baker calculated a Beta of -.690 in her simple regression with students who are considered to be economically disadvantaged. The result of this study shows a higher association with the percentage of students considered to be economically disadvantaged and the Weighted SPP score in Pennsylvania. Also, a more closely aligned study conducted in Pennsylvania by Sable (2015) found, through a mixed methods study, that the best predictor of student achievement was the socioeconomic disadvantage rate. The lower the disadvantage, the higher the student performance.

Null Hypothesis 5, There is no relationship between an SPP score and other factors, is rejected. Given the data and research conducted on the percentage of special education students, the percentage of students considered to be economically disadvantaged, and the percentage of English Language Learners, significant correlations were found.

## Implications of the Results

The purpose of the SPP website was to enhance accountability measures set forth through Act 82. For the first time, individual buildings in school districts were given summative ratings that could be directly compared to other buildings throughout the state. This study began to peel back the layers that add up to a final SPP score to see how spending affected SPP scores. In doing so, relationships to SPP scores were identified.

School districts that met the expected level of performance and earned a Weighted SPP score of 70-79 spent, on average, $17,306 per student. School districts that did not meet the expected SPP score spent $18,122 per student; however, student performance was lower. The implications of this research are that spending in a specific area does not guarantee increases to the Weighted SPP Scores. Stakeholders need to be prudent in their budgeting decisions if the goal is to have students perform well and achieve a 70 or higher on the Weighted SPP Score.

The four most important variables that were identified in this study include the percentage of students considered to be economically disadvantaged, special education (1200) expenditures, student support service (2100) expenditures, and regular instructional (1100) expenditures in medium schools.

Schools that have significant populations of students who are economically disadvantaged are more likely to have lower SPP scores. Out of all of the variables that were analyzed, the economically disadvantaged decimal alone accounted for 58.2 percent of the SPP score when all variables were grouped together. This relationship held true when analyzing data from small and medium schools. The most influence was identified in large schools, where the percentage of students who are economically disadvantaged

accounted for 81.6 percent of the Weighted SPP score. Finally, schools that receive federal funding often have high numbers of students who are economically disadvantaged and show similar relationships between student performance and students considered to be economically disadvantaged.

Special education expenditures are directly related to SPP scores. The more per pupil that is spent on the special education (1200) line item in a school district, the more likely it will result in lower SPP scores. This relationship was identified when the data for all schools were reviewed. The same theme was prevalent when reviewing data for the small and medium schools. The data for the special education percentage in question 5 provided a contrast to the special education expenditures. In the end, limiting the fiscal responsibilities in the special education (1200) expenditures in small schools will have an increased predictive impact on 34 percent, or 170 school districts in this group.

The third important variable identified as a result of the study was student support services (2100). Schools that spend more money in this area have a positive influence on SPP scores compared to schools that do not. The influence of student support services is weak in relation to the first two variables but does provide for a positive influence on SPP scores.

The fourth and final variable is regular education (1100) expenditures in medium-sized schools. Increasing spending in this variable will likely increase Weighted SPP scores. To that end, it is important to note that medium-sized schools comprised the largest group out of the three designations by accounting for 52.1 percent of all schools.

If school leaders want to improve SPP scores, they need to analyze their own data in these three areas. In doing so, they may begin to find strategies for limiting the

negative effect of students considered to be economically disadvantaged and expenditures for students with special needs while furthering the positive effects of the regular education and student support services variables.

In the end, this research calls into question the outcomes of the Weighted SPP scores. The SPP score is an accountability measure from the PDE and defines how other people view a school district. As a result, the SPP score is more closely aligned to the poverty level (percentage of economically disadvantaged students) within the school district than any other variable analyzed throughout this study. Further research is needed to identify strategies schools can use to measure student success while limiting the negative effects of students considered to be economically disadvantaged in Pennsylvania.

## Recommendations

### For Practice

Stakeholders need to begin to analyze the areas in which they spend or allocate dollars if they are not already doing so. Schools should review the expenditures that are being allocated for students with special needs. To simply allocate more funding in the special education (1200) line item will more than likely have a negative effect on the SPP score. Schools also have the opportunity to compare how much they spend per pupil in special education to similarly sized schools.

The student support services (2100) expenditures have positive correlations with student performance and are expenditures that are directly realized by the students. Children's personal needs are addressed through student support services (2100) expenditures. Whether a student is in need of counseling, psychological services, or

social worker services, they can have their needs addressed; this study shows a positive correlation to Weighted SPP Scores. When comparing the 1000 instructional expenditures to the 2000 support services, the support services can be sometimes overlooked and/or removed when budgets are limited. This study shows that not only are those services important for educating and meeting the needs of the whole child, but doing so results in a positive correlation to student performance. Some of the resources that are identified under student support services are resources that students with special needs often use. Schools should be looking at how they deliver special education services. If the focus is on more support outside the classroom, it may pay dividends to see if investing in resources that provide guidance, counseling, and psychological services, along with social workers, would pay off. These services usually address the whole child and provide support to the student and the family. These services would also provide help to students who are economically disadvantaged by providing resources outside of the classroom to the student and his/her family.

Stakeholders in small school districts need to understand how the following variables significantly affect a Weighted SPP score in schools of their size. Significant correlations and regressions were identified for special education (1200) expenditures, total expenditures, federal funding expenditures, the percentage of economically disadvantaged, and the percentage of English language learners.

Additionally, stakeholders from medium-sized schools need to be cognizant of how the following variables affect Weighted SPP scores for schools their size. Significant correlations and regressions were identified in special education (1200) expenditures, regular education (1100) expenditures, student support services (2100)

expenditures, federal expenditures, the percentage of students considered to be economically disadvantaged, and the percentage of students who are identified as part of special education.

In the end, stakeholders from large schools need to understand how the following variables affect Weighted SPP scores. Significant correlations and regressions exist for vocational education (1300) expenditures, federal expenditures, and the percentage of students who are economically disadvantaged.

**For Future Research**

This study should be expanded to determine if other economic variables not used in this study may yield significant relationships to student performance. This study needs to be completed again with additional years of data to determine if the same correlations exist or if new correlations are found. Future research should focus upon the non-expenditure indicators and student performance in Pennsylvania and/or analyzing school districts that have high performance among student who are considered to be economically disadvantaged while also determining the important indicators that allow for success. Additional research is needed to understand why regular education (1100) expenditures were only positive for medium schools. In addition, vocational (1300) expenditures had the most effect on medium-sized schools and as much on small and large schools. Student support services (2100) expenditures only had a significant Beta with medium schools, while a significant relationship was not found for small and large schools. Additional research is needed to shed light on this finding. Additional research is needed to understand the effect of charter schools on SPP scores of the school districts. Currently, school districts are required to pay the charter school tuition payments for

students who reside within the school district attendance area but choose to attend a charter school. The tuition payment for charter schools is accounted for in the regular instruction (1100) accounting code. Future research is needed to better understand the effects of regular education expenditures (1100) if charter school payments were removed from the calculations.

Since the following variables were limitations and were not part of the study, additional research is recommended to determine if class size, teacher certification status including tenure and degree status effect an SPP score. In addition, it is recommended that the family structure (two parent, single parent, grandparent, guardian) from which the student resides be studied to determine if relationships exist in regard to a school's SPP score.

The School Performance Profile will continue in Pennsylvania; however, a new report card called the Pennsylvania Future Ready Index will be introduced in the fall of 2018. This new report card will provide data and, likely, indicate a need for a similar study. Future studies analyzing the data within the PA Future Ready Index will be needed to see if student poverty has the same level of influence upon the index.

## Limitations

This study was a snapshot of one year's worth of data for all 499 Pennsylvania schools and focused upon only one data set. Since the study was quantitative rather than qualitative and reviewed archival data, there was no opportunity to examine questions and focus on schools that were excelling in student performance. Further, the study did not consider variables such as class size, teacher certification, teacher tenure and degree status. The family structure in which the students reside was not part of this study. For

example, did the students live in a two parent, single parent, grandparent, or guardian household.

The variables that were analyzed were important but not all-encompassing. The data were grouped together instead of being divided by individual line items. Additionally, many other accounting codes could be reviewed to determine if relationships exist.

## Conclusion

This study analyzed four statements that revolved around student performance and expenditures, along with one statement that focused on student performance and non-expenditure variables. Significant relationships were found, which provides important information for key stakeholders to consider. School board directors and superintendents need to identify how much money is enough to adequately educate students today while also being fiscally responsible. School directors and superintendents now know that regular education (1100) and student support services (2100) expenditures have significant positive returns on student performance. In addition, the special education (1200) expenditures influence SPP scores, especially in small school districts. The percentage of economically disadvantaged students was the most predictive variable for an SPP score out of all the variables.

The production function theory which measures inputs (capital and labor) against outputs (product) in attempt to find an efficient output was used to review per student costs and the resulting SPP scores. As reviewed in Chapter two of this study, in the past, education has tried to find opportunities to implement a business model in education. This study has shown that a one size (SPP score) does not fit in adequately measuring

student achievement for all schools in Pennsylvania. It is clear that unlike a business model where supplies are similar and can be controlled for specific characteristics school districts educate every student who walks through the doors each year. This is important as legislators create a one size fits all tool to evaluate schools. Creating a one size fits all strategy will be difficult to implement because of the unique and individual strengths and needs of the students who attend the schools. This study found the SPP score to be most closely aligned not to student performance and spending but to the percentage of students who are economically disadvantaged (Poverty) within a school district.

This study set out to find how much funding is enough to adequately educate students within a school district. The data and variables were analyzed in several ways, including size of the school district and level of school achievement. In the end, given the data, the third question was the only one that could only be answered. In order for schools to reach the expected SPP score of 70, on average, they spent $17,300 per student. In the end, the study provided areas of focus and a baseline for school directors and stakeholders to compare their data to that of the states for the remaining research questions. In doing so, schools can have concrete information to make more informed decisions moving forward.

References

Adcock, J. C. (2015). *The funding for student achievement: A correlation of Colorado district funding levels and standardized test scores* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3684453)

Allen, L., Hogan, C. J., & Steinberg, A. (1998). *Knowing and doing: Connecting learning and work.* Retrieved from https://www.brown.edu/academics/education-alliance/sites/brown.edu.academics.education-alliance/files/publications/k_and_d.pdf

American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, 123 Stat. 115, 516 (2009).

Arrington, B. M. (2010). *A study of the correlation between instructional expenditures and student achievement in Illinois public schools* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3404814)

Baker, B. D. (2016). *Does money matter in education?* (2nd ed.). Retrieved from http://www.shankerinstitute.org/sites/shanker/files/ moneymatters_edition2.pdf

Baker, L. M. (2015). *The relationship between local fiscal capacity and student achievement in Virginia public school divisions* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3687671)

Benson, R. B. (2015). *An analysis of the impact of the education special purpose local option sales tax (E-SPLOST) on capital outlay expenditures in Georgia school districts* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3686487)

Besanko, D., & Braeutigam, R. R. (2005). *Microeconomics*. Hoboken, NJ: Wiley.

Bissett, J., & Hillman, A. (2013). *PARRS history of school funding in Pennsylvania 1682–2013*. Retrieved from http://docplayer.net/11389358-The-history-of-school-funding-in-pennsylvania-1682-2013.html

Bowles, S. (1970). *Towards an educational production function*. Retrieved from http://www.nber.org/chapters/c3276.pdf

Career Readiness Council. (2012). *Building blocks for change: What it means to be career ready.* Retrieved from https://cte.careertech.org/sites/default/files/CRPC_4pager.pdf

Casner-Lotto, J., & Barrington, L. (2006). *Are they really ready to work? employers' perspectives on the basic knowledge and applied skills of new entrants to the 21st century U.S. workforce*. Washington, DC: Partnership for 21st Century Skills. Retrieved from http://proxy-iup.klnpa.org/login?url=https://search-proquest-com.proxy-iup.klnpa.org/docview/881458569?accountid=11652

Childs, T. S., & Shakeshaft, C. (1987). A meta-analysis of research on the relationship between educational expenditures and student achievement. *Journal of Education Finance, 12*(2), 249-263.

Civil Rights Act of 1964, Pub. L. 88-352, 78 Stat. 241 (1964).

Coleman, J. S. (1966). *Equality of educational opportunity*. Washington, DC: U.S. Government Printing Office.

Commonwealth of Pennsylvania. (n.d.). *2017-2018 Governor's Executive Budget* Retrieved from https://www.budget.pa.gov/PublicationsAndReports/CommonwealthBudget/Docu

ments/2017-18%20Proposed%20Budget/2017-18%20Budget%20Document%20-%20Web.pdf

Commonwealth of Pennsylvania, State Board of Education. (2007, December). *Summary of costing out study*. Retrieved from http://www.paschoolfunding.org/wp-content/uploads/2011/02/CostingOutStudySummary.pdf

Creswell, J. W. (2014). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Boston, MA: Pearson.

Dalton, E. A. (2010). *Relationship between professional development expenditures and student achievement* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3428757)

Davidson, M. C. (2015). *Tennessee per-pupil expenditures in special education and academic achievement* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3727479)

Davis, W. L., Marcum, R. S., Mitchell, B. C., & Redlich, M. A. (2007). *The impact of school district fiscal spending on student achievement* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3280193)

Doyle, S. (2015). *Relationships between high school proficiency and expenditures: Proficiency scores and unemployment rates* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3734433)

Education Law Center. (2013). *Funding, formulas, & fairness.* Retrieved from http://www.elc-pa.org/wp-content/uploads/2013/02/ELC_schoolfundingreport.2013.pdf

Elementary and Secondary Education Act of 1965, Pub. L. 89-10 (1965).

ESSA (2015). Every Student Succeeds Act of 2015, Pub. L. No. 114-95 § 114 Stat. 1177 (2015-2016).

Gao, J. (2011). *School resources and student achievement: Evidence from panel data* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3477229)

Goins, J. M. (2015). *A study of Tennessee K–12 per-pupil expenditures in relation to student achievement* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3739908)

Goodman, C. J., & Mance, S. M. (2011). Employment loss and the 2007–09 recession: An overview. *Monthly Labor Review.* Retrieved from https://www.bls.gov/mlr/2011/04/art1full.pdf

Gordon, M. R. (2015). *A study of the impact of school consolidation on student achievement and district financial health* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3736811)

Greenwald, R., Hedges, L. V., & Laine, R. (1996). Interpreting research on school resources and student achievement: A rejoinder to Hanushek. *Review of Educational Research, 66*(3), 411-416.

Griffith, B. K. (2014). *The financial impact of charter schools' enrollment on traditional public school expenditures, resource allocation and programming* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3647450)

Grovum, J. (2014, September 14). 2008 financial crisis impact still hurting states. *USA Today*. Retrieved from

https://www.usatoday.com/story/money/business/2013/09/14/impact-on-states-of-2008-financial-crisis/2812691/

Haile, T. K. M. (2014). *The high school diploma: An investigation into student and employer perspectives of its preparation for success in the workplace* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3642188)

Hanushek, E. A. (1986). The economics of schooling: Production and efficiency in public schools. *Journal of Economic Literature, 49*, 1141–1177.

Harter, E. A. (1998). *The relationship between educational expenditures and student achievement at the school level* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 9822216)

Harvard Graduate School of Education. (2011). *Pathways to prosperity: Meeting the challenges of preparing young Americans for the 21st century.* Retrieved from https://www.nmefoundation.org/getmedia/d341e9eb-5f1e-4659-bc45-e5f5a0b08136/Pathways-to-Prosperity-Feb2011

Heier, S. L. (2011). *The relationship between standardized test scores of socioeconomically disadvantaged students in Title I and non–Title I schools* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3482830)

Helmy, A. A. (1981). *A family of generalized transcendental production functions* (Doctoral dissertation). Available from ProQuest Dissertations & Theses Global database. (Order No. 8118570)

Jackson, C. K., Johnson, R. C., & Persico, C. (2016). The effects of school spending on educational and economical outcomes: Evidence from school finance reforms. *Quarterly Journal of Economics, 131*(1), 157-218.

Jobs for the Future. (2014). *Impact report 2014.* Retrieved from http://www.jff.org/sites/default/files/publications/materials/JFF-Impact-Report-102814.pdf

Keagy, D. R., & Piper, D. M. (2016). *Pennsylvania school business: A Guide for educational administrators* (4th ed.). Harrisburg, PA: Pennsylvania Association of School Business Officials.

Konstantopoulos, S., & Chun, V. (2009). What are the long-term effects of small classes on the achievement gap? Evidence from the lasting benefits study. *American Journal of Education, 116*(1) 125-154.

Lewis, B. S. (2009). *The buck stops here: A correlation coefficient study of standardized test scores and school district funding levels* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3368754)

Library of Economics and Liberty. (2012). *Scarcity*. Retrieved from http://www.econlib.org/library/Topics/College/scarcity.html

Malone, P. N. (2000). *The impact of fund balance and instructional expenditures on student achievement in Texas public schools* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 9963223)

Mitra, D. (2011). *Pennsylvania's best investment: The social and economic benefits of public education.* Retrieved from http://www.elc-pa.org/wp-content/uploads/2011/06/BestInvestment_Full_Report_6.27.11.pdf

Moore, G. M. (2012). *The interrelationship of school district expenditures and student academic achievement in Oklahoma public elementary school districts* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3536738)

National Association of Secondary School Principals (2016). *Title V-flexibility and accountability-rural education and achievement program.* Retrieved from https://www.principals.org/advocacy/essa-toolkit/essa-facts-sheets/title-v%E2%80%94flexibility-and-accountability%E2%80%94rural-education-and achievement-program?SSO=true

National Conference of State Legislators (2016). *Summary of the Every Student Succeeds Act, legislation reauthorizing the Elementary and Secondary Education Act.* Retrieved from https://www.ncsl.org/documents/educ/ESSA_summary_ NCSL.pdf

No Child Left Behind Act of 2001, Pub. L. 107-110, § 115, Stat. 1425 (2002).

PA Office of the Budget. (2018). *Chart of accounts for PA local educational agencies.* Retrieved from https://www.education.pa.gov/Documents/Teachers-Administrators/School%20Finances/Comptrollers%20Office/Chart%20of%20Accounts.pdf

Pennsylvania Department of Education. (n.d.-a). *Academic achievement report: 2011–2012*. Retrieved from http://paayp.emetric.net/Home/About#q12

Pennsylvania Department of Education. (n.d.-b). *Overview of annual budget timelines & terminology 2015-2016 fiscal year.* Retrieved from https://www.education.pa.gov/Documents/Teachers-

Administrators/Property%20Tax%20Relief/Overview%20on%20Budget%20Timelines%20and%20Terminology.pdf

Pennsylvania Department of Education. (2008). *Glossary of accounting terms.* Retrieved from http://www.education.pa.gov/Documents/Teachers-Administrators/Child%20Accounting/General%20Information/ChildAcctg%20Glossary.pdf

Pennsylvania Department of Education. (2013). *ESEA flexibility request from Pennsylvania*. Retrieved from https://www2.ed.gov/policy/eseaflex/approved-requests/parequest3272013.pdf

Pennsylvania Department of Education. (2014). *Aid ratio calculation methodology.* Retrieved from http://www.education.pa.gov/Documents/Teachers-Administrators/School%20Finances/Finances/Financial%20Data%20Elements/Aid%20Ratios/Aid%20Ratio%20Calculation%20Methodology.pdf

Pennsylvania Department of Education. (2015a). *Pennsylvania System of School Assessment (PSSA)*. Retrieved from http://www.education.pa.gov/K-12/Assessment%20and%20Accountability/PSSA/Pages/default.aspx

Pennsylvania Department of Education. (2015b). *PSSA results*. Retrieved from http://www.education.pa.gov/data-and-statistics/PSSA/Pages/default.aspx

Pennsylvania Department of Education. (2015c). *Title I*. Retrieved from http://www.education.pa.gov/Teachers%20-%20Administrators/Federal%20Programs/Pages/Title%20Information/Title-I.aspx

Pennsylvania Department of Education. (2016a). *General fund budget*. Retrieved from http://www.education.pa.gov/Teachers%20-

%20Administrators/School%20Finances/Finances/GeneralFundBudget/Pages/default.aspx

Pennsylvania Department of Education. (2016b). *Pennsylvania Information Management System (PIMS)*. Retrieved from http://www.education.pa.gov/teachers%20-%20administrators/pims/pages/default.aspx#tab-1

Pennsylvania Department of Education. (2016c). *2011–2012 PSSA and AYP results.* Retrieved from http://www.education.pa.gov/Data-and-Statistics/PSSA/Pages/2011–2012-PSSA-Results.aspx#tab-1

Pennsylvania Department of Education. (2017a). *Data files.* Retrieved from http://paschoolperformance.org/Downloads

Pennsylvania Department of Education. (2017b). *Welcome.* Retrieved from http://paschoolperformance.org/

Pennsylvania Department of Education. (2017c). *Every Student Succeeds Act. Pennsylvania consolidated state plan.* Retrieved from http://www.education.pa.gov/Documents/K-12/ESSA/Resources/Pa%20ESSA%20Consolidated%20State%20Plan.pdf

Pennsylvania Department of Education. (2018a). *Basic education funding report.* Retrieved from http://www.education.pa.gov/Pages/Basic-Education-Funding-Report.aspx

Pennsylvania Department of Education. (2018b). *Every Student Succeeds Act Pennsylvania consolidated plan*. Retrieved from http://www.education.pa.gov/Documents/K-

12/ESSA/Resources/PA%20ESSA%20Consolidated%20State%20Plan%20Final.pdf

Pennsylvania Department of Education. (2018c). *Property tax relief.* Retrieved from http://www.education.pa.gov/teachers%20-%20administrators/property%20tax%20relief/pages/default.aspx

Pennsylvania Office of Administration. (2008). *Pennsylvania's new Right to Know law*. Retrieved from http://www.oa.pa.gov/Programs/Records-Mgmt/Documents/pa_righttoknowlaw.pdf

Public School Code of 1949 (H.B. 1901), Act No. 14, Pub. L. 30 (1949).

Richmond, P. N. (2007). *Wealth and achievement gaps: An examination of Virginia middle schools* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3289962)

Ryan, T. P. (2012). *How districts allocate educational resources in Rhode Island: The relationship between spending and student achievement* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3509761)

Sable, M. E. (2016). *A mixed method examination of student achievement indicators* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses Global. (Order No. 10014927).

Snyder, T. D. (Ed.). (1993). *120 years of American education: A statistical portrait.* Washington, DC: National Center for Education Statistics. Retrieved from https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=93442

Steelman, C. W. (2008). *Relationships between expenditures and student performance in Chapter 41 and 42 Class 1A-3A Texas school districts* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3415950)

Stringfellow, K. E. (2007). *Relationship between educational spending and student achievement in Rhode Island public schools* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3270298)

Terry, J. W. (2011). *Where does money matter: The impact of expenditures on student achievement* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (Order No. 3467971)

Todd, P. E., & Wolpin, K. I. (2003). On the specification and estimation of the production function for cognitive achievement. *Economic Journal, 113*(485), 3-33.

Turley, L. (2009). *Considering adequacy: Educational spending and student achievement in the Texas public school system* (Doctoral dissertation). Available from ProQuest Dissertations & Theses Global database. (Order No. 3361244)

United States National Commission on Excellence in Education. (1983). *A nation at risk: The imperative for educational reform: A report to the Nation and the Secretary of Education, United States Department of Education*. Washington, DC.: The Commission.

U.S. Bureau of Labor Statistics. (n.d.). *Spotlight on statistics*. Retrieved from https://www.bls.gov/

U.S. Department of Education. (n.d.). *Title I – Improving the academic achievement of the disadvantaged*. Retrieved from https://www2.ed.gov/policy/elsec/leg/esea02/pg1.html

U.S. Department of Education. (2014). *Race to the Top program executive summary*. Retrieved from http://www2.ed.gov/programs/racetothetop/executive-summary.pdf

U.S. Department of Education (2018). *Fiscal years 2017-2019 state tables for the U.S. department of education.* Retrieved from https://www2.ed.gov/about/overview/budget/statetables/index.html

U.S. Department of Labor. (1991). *What work requires of schools: A SCANS report for America 2000*. Retrieved from ERIC database. (ED332054)

Van Duzer, E. (2006). *Overcoming the limitations of the factory system of education*. Retrieved from https://files.eric.ed.gov/fulltext/ED490530.pdf