

STUDENT ACHIEVEMENT IN ILLINOIS HIGH SCHOOLS AND THE  
RELATIONSHIP TO STUDENT AND TEACHER FACTORS

BY

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DISSERTATION

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## **Abstract**

Education is critical to a democratic nation and in creating a strong economy (Verstegen, 2008). The importance of education is clear across society as an important tool in creating equal opportunities for all children regardless of race, ethnicity, and socioeconomic status. As school accountability increases, it is critical to determine what programs and resources have the biggest impact on student achievement so that policymakers and educators better understand how to allocate educational funding.

This quantitative ex-post facto longitudinal study involved examining the relationship between socioeconomic status, per pupil expenditures, teacher attendance, salaries, education, retention, graduation rates, and student achievement at the high school level from 2017 through 2019. Student achievement was measured using the SAT score. A Pearson Product moment-correlation was calculated to analyze the degree and directional relationship between the variables. A positive correlation was noted across all three years between instructional expenditures per student and academic achievement. This analysis supports the research that additional educational funding leads to increases in student achievement.

Unique to this research study was the addition of the split data sets by designating schools with 34% or more students as low-income and then analyzing the data across 3 years. The large discrepancy in the percentages of low-income students across districts prompted the split to better examine the relationship between low-income students on the various teacher and student factors. The findings highlight the negative correlation between low-income students with academic achievement, graduation rates and teacher retention.

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## **CHAPTER 1: INTRODUCTION**

The success of a democratic society is dependent on a quality public education system. The great driver of human progress throughout time has been the struggle for education and equality and not the assertion of property rights (Piketty, 2020).

This study examined student and teacher factors in Illinois high school districts and the relationship to student achievement for the years 2017 through 2019. This chapter provides an introduction of the study, historical background, purpose of the study, problem statement, and theoretical framework. Additionally, the methodology, relevant research questions, delimitations, limitations, and definition of key terms are provided along with an overview of the remaining four chapters.

### **Background of the Study**

American schools are now being held to an increasing level of accountability across the nation. Through education reforms, school transparency is at an all-time high. Schools across the state of Illinois are required to publish academic results for all students and subgroups, student attendance, class size, teacher retention rates, instructional and operation spending per student, and other pertinent data on school report cards. Along with the new reforms, the federal government has provided large sums of money to finance the new mandates. The question that researchers, politicians, educators, and taxpayers are seeking to answer is whether the money designated for educational funding is making a difference on student achievement.

Current research concedes that money does make a difference in most educational institutions today, but researchers, educators, and policy-makers are not able to define the exact dollar amount to ensure adequacy. The most current research no longer investigates the

correlations between dollars and outcomes, but instead attempts to determine the effect of “purchased inputs” such as teacher characteristics and outcomes (Springer et al., 2008).

It is critical to determine what programs and resources to allocate money towards to have the biggest impact on student achievement. The research on effective schools demonstrates that simply spending more money on schools does not provide any guarantees of better schools or increased student achievement. The determining factor appears to be how that money is allocated that makes the ultimate difference. Rossmiller (2008) stated, “Money is a necessary but not a sufficient requisite to more effective schools. Some schools are simply more effective than other schools even though they spend about the same average amount per student and serve comparable students.”

### **Historical Background**

At the state and federal levels, school accountability and student results-based incentive systems in public education have dominated the education policy discussions since President Bush sponsored the No Child Left Behind Act (NCLB) which became law in 2002. The NCLB required states to test students in third through eighth grade and again in high school. The Act also required States to assess the adequate yearly progress of students and subgroups of students towards the goal of 100% proficiency by 2014.

In July of 2009, President Obama and U.S. Secretary of Education Arne Duncan implemented the Race to the Top (RTTT) initiative, which the federal government allocated \$4.35 billion to award to states meeting specific educational policies. RTTT funds influenced states and school districts to comply with the Common Core State Standards, lift charter school caps, and implement new performance reviews for teachers and administrators. These

educational reforms were created to establish high expectations and improve student achievement for school districts across the United States.

Although technically voluntary, these reforms were reinforced with large amounts of federal funding to entice states and school districts to comply with the new policies. RTTT funds were awarded over three phases from March of 2010 through December of 2011, and 46 states submitted applications. Eighteen states and the District of Columbia were awarded funds that ranged from \$17 million to \$700 million. In the third phase of applications, Illinois was awarded \$43 million (Howell, 2015). The reforms have brought a great deal of attention and focus on school accountability and academic performance through local and national media.

At the high school level in the State of Illinois, student achievement has historically been measured in eleventh grade. Students at this level are currently required to take the Scholastic Assessment Test (SAT), which is a standardized test widely used for college admissions. The SAT is being used as one accountability measure at the high school level.

As both federal and state governments continue to increase school accountability and raise student academic achievement expectations, it is critical to assess the impact of the new educational policies on school performance. Although increased accountability, transparency, and an increase in student performance expectations are all positive outcomes, the NCLB cannot be declared a success at this time. NCLB's mandate of 100% proficiency by 2014 for all student subgroups was not achieved across the state. In 2017, student performance on the SAT varied from a total score of 858 to 1233.

Based on the differences in available funding, student demographics and enrollment across the state, the range of scores on the SAT is not surprising. It has yet to be determined if the newest educational reform, RTTT, will have a positive impact on student achievement and

improve the school experience for all students. Therefore, the purpose of this quantitative study was to determine if a relationship exists between Socioeconomic status (SES), student enrollment, student attendance rate, graduation rate, instructional spending per pupil, average teacher salary, teacher education, teacher attendance, teacher retention, and achievement for all Illinois High School Districts as indicated on the Illinois School Report Card.

### **Statement of the Problem**

The importance of education is clear today by advanced nations across the world. Public education is a means for nations to maintain both political and economic stability (Alexander, 2008). Education is also an important tool to level the playing field to create equal opportunities for all children regardless of race, ethnicity, and socioeconomic status. As the expectations for schools across the state increase and transparency is the new norm, it is necessary to spend education funds efficiently and wisely. Nonetheless, funding equality does not appear to be the case across the 863 public school districts in the state of Illinois.

Although it is not the only factor in determining the quality of education, funding is an important aspect in improving public schools. School districts that are funded well are able to provide students with additional programs and services to meet their academic, behavioral, and social needs. These schools are also able to keep class sizes lower and pay teachers higher salaries, which in turn attracts the highly qualified teachers to those districts.

School funding differences create large disparities in the quality of public education. Biddle and Berliner (2002) reported that these disparities include differences in the quality of school facilities, teacher experience and qualifications, curriculum, equipment for instruction, class size, and the number of classroom aides.

Current Illinois school finance systems were created almost a century ago during the industrial era. These outdated systems were designed to provide children with a minimum education during that era; yet, society and schooling have changed dramatically since that time. Verstegen (2002) professed, “With the national emphasis on teaching all students to high standards, new models of state finance systems are needed that align school funding more closely to standards-based reform aimed at high outcomes for all children and youths.” New Illinois finance systems must move from providing school funding for a minimum education to a system that funds a high quality of education for all students.

Illinois newly implemented Evidence Based Funding system is a step in the right direction. On August 31, 2017, Governor Bruce Rauner signed into law Public Act 100-0465 the Evidence-Based Funding for Student Success Act. This new law systematically changes the way state public-school districts receive the majority of funds. The system directs funds to the resources deemed to have the biggest impact on student achievement as well as towards the neediest of students in the state. The evidence-based funding model is a large step toward understanding and addressing the relationship between equity, adequacy, and student outcomes (Illinois State Board of Education [ISBE], 2019)

With the large sums of money that both federal and state governments are allocating towards education, it is evident that policy-makers, parents, and tax payers will expect results. The relationship between educational spending and student achievement will always be a focal point with those stakeholders (Jeffereson, 2005). Given the current climate, it is necessary to identify whether a relationship exists between student achievement and various student and teacher characteristics to help determine how best to allocate those funds.

## **Purpose Statement**

The purpose of this quantitative ex-post facto longitudinal study was to determine if a relationship exists between SES, student enrollment, student attendance rate, graduation rate, instructional spending per pupil, average teacher salary, teacher education, teacher attendance, teacher retention, and achievement for all Illinois High School Districts as indicated on the Illinois School Report Card. Student achievement was measured by average SAT score for each District. The study involved an investigation of which student factors and teacher factors may impact student achievement on the Illinois state achievement test. The Illinois State Report Card was used to access the pertinent information. This study focused on data available from 2017 through 2019 for the 97 high school districts in Illinois.

## **Rationale**

Based on changes in the Illinois state funding formula and the implementation of Every Student Succeeds Act (ESSA), it is critical that administrators and the board of education for high schools across Illinois understand the relationship between student achievement and teacher and students factors to determine how best to direct expenditures. Research shows that a variety of resources have positively influenced student achievement, and even reasonable increases in educational funding is linked with significant increases in achievement (Greenwald et al., 1996).

## **Conceptual Framework**

The relationship between student achievement at the high school level on the SAT and various student and teacher characteristics were examined through the lens of allocative efficiency. I examined whether educational spending on variables such as SES, student enrollment, student attendance rate, instructional spending per pupil, average teacher salary,

teacher education, teacher attendance, teacher retention has any impact on student achievement and graduation rates.

Knoeppel et al. (2007) used allocative efficiency as a conceptual framework in their study on the relationship between resources and student achievement. This framework examines a variety of educational inputs and outputs and determines whether the correct inputs were used to achieve the desired results.

### **Research Questions**

The following research questions (RQ) guided this study:

RQ1: Is there a relationship between instructional expenditure per-pupil, student socioeconomic status, student attendance rate, and *student achievement* as identified by the SAT for high school districts in Illinois in 2017, 2018, and 2019?

RQ2: Is there a relationship between instructional expenditure per-pupil, student socioeconomic status, student attendance rate, and *graduation rate* as identified by the Illinois Report Card for high school districts in Illinois in 2017, 2018, and 2019?

RQ3: Is there a relationship between teacher education, teacher salary, teacher retention, teacher attendance, teacher evaluation and *student achievement* as identified by the SAT for high school districts in Illinois in 2017, 2018, and 2019?

RQ4: Is there a relationship between teacher education, teacher salary, teacher retention, teacher attendance, teacher evaluation and *graduation rate* as identified by the Illinois School Report Card for high school districts in Illinois in 2017, 2018, and 2019?

The following null hypotheses will be tested:

H1: There is no significant relationship between instructional expenditure per-pupil, student socioeconomic status, student attendance rate, and student achievement as identified by the SAT for high school districts in Illinois in 2017, 2018, and 2019.

H2: There is no significant relationship between instructional expenditure per-pupil, student socioeconomic status, student attendance rate, and graduation rates as identified by the Illinois School Report Card for high school districts in Illinois in 2017, 2018, and 2019.

H3. There is no significant relationship between teacher education, teacher salary, teacher retention, teacher attendance, and student achievement as identified by the SAT for high school districts in Illinois in 2017, 2018, and 2019.

H4. There is no significant relationship between teacher education, teacher salary, teacher retention, teacher attendance, and student graduation rate as identified by the Illinois School Report Card for high school districts in Illinois in 2017, 2018, and 2019.

### **Significance of the Study**

There is limited research on the relationship between student and teacher factors and academic achievement. Research has found that teacher characteristics, such as ability and experience, correlate more consistently to student performance on achievement tests than other characteristics. Research also shows that money does matter and makes a positive impact on academic achievement. Nonetheless, further research is required to determine the most efficient means to allocate existing and new educational dollars.

The purpose of this quantitative study was to determine if a relationship exists between SES, student enrollment, student attendance rate, graduation rate, instructional spending per pupil, average teacher salary, teacher education, teacher attendance, teacher retention, and achievement for all Illinois High School Districts as indicated on the Illinois School Report Card.

By investigating these factors and the effect on student achievement, this study provides policy-makers and school officials with a roadmap on how best to allocate educational funds. With the increased accountability on districts to raise student achievement and spend taxpayer's money effectively, it is critically important that we determine which factors correlate highest to improved achievement results.

The use of instructional expenditures per pupil instead of operating expenditures per student or total expenditures was used in this study when relationships were analyzed. All school districts in Illinois are required to report financial data in the audited Annual Financial Reports. ISBE then calculates instructional spending and operational spending and divides both by the district's student enrollment. Operational expenditures per student includes nearly all costs for overall operations in the school district, including instructional spending. ISBE defines instructional expenditures per student as activities directly dealing with the teaching of students or the interaction between students and teachers (Illinois Report Card, 2020).

### **Assumptions**

The following assumptions were critical to the research study design and implementation:

1. The data provided by the ISBE on the Illinois Report Card for student achievement on the SAT are accurate and the SAT is a valid measure of student achievement.
2. The student characteristic data provided by the ISBE on the Illinois Report Card such as student enrollment, student socioeconomic status, student attendance rate, and graduation rate are consistent and reliable.

3. The teacher characteristic data provided by the ISBE on the Illinois Report Card such as teacher salary, teacher retention, and teacher attendance are consistent and reliable.
4. The instructional expenditures per student defined by the ISBE have been reported accurately and consistently utilized across all high school districts.

### **Delimitations**

Only data from high school districts in the state of Illinois. Were used in this study. Although it is important to examine the relationship between student achievement and various characteristics between students and teachers, the focus of this study was solely on those relationships in Illinois.

Another delimitation is that student achievement was measured only on the composite score on the SAT. It is important to note that many other measures exist to determine student achievement such as local assessments, common assessments, and national assessment measures such as Measure of Academic Progress (MAP) tests.

A third delimitation of this study was that the focus was only on high school districts across the state of Illinois. It is important to note that high school districts comprise fewer than half of the Illinois public school districts. In 2014, there were 863 public school districts: 375 K-8 elementary school districts, 100 high school districts, and 388-unit school districts. Unit districts are districts that serve kindergarten through grade 12, elementary districts serve kindergarten through Grade 8 and high school districts serve students in Grade 9 through Grade 12.

## **Limitations**

One limitation of the results of this study is that data was only examined from Illinois public high schools. Therefore, the results cannot be generalized across other states on non-public school systems. Another limitation was the use of only one assessment measure, the SAT, to measure student achievement. Educators have long debated the best way to measure achievement; however, for the purposes of this study, the assumption was that the SAT is reliable and valid. The study also includes graduation rates as an alternative measure to ascertain the success of each school.

This study did not involve an examination of data from various non-public schools across the state. The results of this study are strictly limited to public high school districts in Illinois.

## **Definition of Terms**

Throughout this study, a number of particular terms were used. To provide the reader with a common background and better understanding, the following terms are defined:

**High school district.** An Illinois high school district that generally includes students in grades nine through twelve.

**Illinois school report card.** The Illinois school report card is an annual report released by the Illinois State Board of Education that shows how the state and each school and district are progressing on a wide range of educational goals (ISBE, 2018).

**Instructional expenditures per student.** Instructional expenditures per student involves the direct costs of teaching pupils or the interaction between teachers and pupils (ISBE, 2017).

**Low-income students.** These identified students come from families receiving public aid; live in institutions for neglected or delinquent children; are supported in foster homes with public funds; or are eligible to receive free or reduced-price lunches (ISBE, 2017).

**SAT.** The SAT is a standardized assessment designed to measure basic reading, math and writing skills. The SAT is designed by the College Board, which is a mission-driven not-for-profit organization. Most colleges and universities utilize SAT scores for admission procedures (College Board, 2018).

**SAT exceeds standards.** SAT exceeds standards means that the student has exceeded the proficiency level and demonstrates a thorough understanding of the knowledge and skills needed relative to the Illinois Learning Standards (Illinois Report Card, 2019).

**SAT meets standards.** The SAT meets standards means that the student has met the proficiency level and demonstrates adequate understanding of the knowledge and skills needed relative to the Illinois Learning Standards (Illinois Report Card, 2019).

### **Method of the Study**

This research was conducted using a quantitative study with a nonexperimental design. In this study the independent variable was student characteristics such as instructional expenditure per-pupil, student socioeconomic status, student attendance rate, graduation rate and teacher characteristics such as teacher education, teacher salary, teacher retention and teacher attendance. The dependent variable was the SAT composite scores for high schools in Illinois.

The data for this study was collected from the Illinois School Report Card. A causal comparative study of “ex post facto” study was used in this research project. In this type of study, the data is gathered retrospectively, and the independent variable is not manipulated as in an experiment (Krathwohl, 2009).

This study involved examining whether a relationship exists between various teacher and student factors with student achievement and graduation rates. By researching these factors and their corresponding impact on student achievement and graduation rates, the Illinois State Board

of Education will better understand which factors make the biggest impact on student achievement. With this information, the ISBE will also be able to make more educated decisions on how to better fund Illinois schools by allocating educational funds in the areas that most positively impact academic achievement.

### **Nature of the Study**

The method utilized in this research study was a nonexperimental quantitative design. Cresswell (2009) defined quantitative research as a way to examine objective theories by testing the relationship of the variables. Typically, data is analyzed using statistical procedures. This researcher studied the relationship between student achievement in high schools across Illinois and various teacher and student factors.

### **Overview of the Study**

This paper will consist of five chapters. This chapter provided the reader with an understanding of the significance raised accountability in Illinois high school districts, purpose of the paper, the research questions driving the study and an overview of the literature on the topic.

Chapter 2 consists of a review the current literature related to the Illinois school funding system. The review includes literature available on teacher qualifications, teacher salary, teacher attendance, student attendance, per-pupil spending, student socioeconomic status, and the relationship those factors have on student achievement.

Chapter 3 presents the research methodology selected for this study to answer the research questions. In particular, this quantitative correlation study examined the following variables: instructional expenditure per-pupil, student socioeconomic status, student attendance rate, graduation rate, teacher education, teacher salary, teacher retention, teacher attendance, and

student achievement data. I collected the data utilizing reports from the Illinois Interactive Report Card.

Chapter 4 provides an analysis generated from the research. The analysis involves statistical analysis: regression analysis, analysis of variance, correspondence variance, and calculation of Pearson and Spearman correlation coefficients. This statistical analysis helps determine any correlation in the variables.

Chapter 5 involves a discussion of the results, implications, recommendations for further study, and a conclusion of this study.

## **CHAPTER 2: LITERATURE REVIEW**

### **Introduction**

Education is critical to a democratic nation and in creating a strong economy (Verstegen, 2008). The educational reform movement created by No Child Left Behind and Race to the Top has had educators, parents, and policymakers focused on closing the achievement gap. An important factor in closing the achievement gap is to provide quality public schools and access to highly qualified teachers to all students regardless of race or socioeconomic status.

Although it is not the only factor in determining the quality of education, funding is an important aspect in improving public schools. School districts that are funded well are able to provide students with additional programs and services to meet their academic, behavioral, and social needs. The ongoing debate among scholars and policymakers is what constitutes an adequate education and how to determine the funding necessary to provide an adequate education for all students.

The purpose of this review of literature is to focus on various student and teacher factors and their impact on student achievement. Those concepts are defined in their relation to school finance. Research in the area of teacher factors such as salary, attendance, and certification along with student factors such as attendance and socioeconomic status is extensive and is reviewed in this section. Student achievement and the State's method to measure the achievement will also be examined. Lastly, a historical review of federal educational reforms and their subsequent impact on the State's educational system is discussed.

### **Teacher Factors**

Researchers and educators have long debated the school factors that influence student achievement, but recent educational reforms have increased the scrutiny of policy makers on those

school inputs (Darling-Hammond, 2000). Research has demonstrated that teachers are the most critical aspect of the educational process when it comes to student achievement (Goldhaber, 2002; Rivkin et al. 2005). A number of teacher variables have been studied over time such as salary, certifications, experience, and attendance.

Darling-Hammond (2000) found that although student demographic characteristics are strongly linked to student achievement, these characteristics are less significant in predicting achievement levels than the variables involved in assessing teacher qualities. A well-prepared teacher can have a stronger influence on student achievement than student factors such as poverty levels, language background and minority status. Teachers have a huge influence on student achievement. Students who are assigned to several highly effective teachers in a row have demonstrated greater achievement and gains than those students who have been assigned to less effective teachers for several years (Sanders & Rivers, 1996).

### *Salaries*

Teacher salaries are generally based on years of service, the degree, and college credits. It is also common in most districts to see a higher salary schedule for secondary teachers as opposed to those teachers at the elementary level. This salary schedule has been in place since the early 1920s and was a progressive step at the time based the previous system where male and female and minority and non-minority teachers were all placed at different salaries even when they had the same qualifications (Odden, 2008). Teacher salary schedules are currently being reformed across the nation due to the Race to the Top education reform. This federal initiative includes incentives for states and districts to revamp their current schedules to increase salaries in an attempt to entice and retain high quality teachers to districts (Strunk & Zeehandelaar, 2011).

Teacher salaries drastically vary across the nation and even within each state. According to the National Center for Educational Statistics (2016), in 2014-15, the average elementary teacher made \$57,225, while the average secondary teacher \$57,609. In Illinois during the same years an average annual salary for an elementary and secondary teacher was \$61,063.

Salary information is important to researchers, policy makers, and educators for a number of reasons. The first reason is that some researchers question whether teacher salaries in general are enough to make the teaching profession an attractive career choice (Goldhaber & Player, 2005). Alexander et al. (2015) argued that if teacher salaries are relatively low compared to the per capital income of a nation, then less qualified or able people will enter the teaching profession. Without a financial incentive to do so, prospective teachers will select alternative white-collar professions that require similar education and training as a teacher.

Another reason is that teacher salaries consume the greatest percentage of the annual educational budget for each school district. With the implementation of recent educational reforms, the focus is on improving student achievement so educators must be able to demonstrate to policy-makers and taxpayers that the money from that budget is being utilized effectively (Alexander et al., 2015).

Verstegen and King (1998) discovered a statistically significant relationship between student achievement and teacher salaries. Teachers are an important resource in the effort to increase student achievement, so the emphasis on hiring and retaining effective teachers has increased (Maiden & Evans, 2009). Greenwald et al. (1996) conducted a meta-analysis study and estimated that increases in salaries for teachers correlated with a 0.16 standard deviation increase in student achievement at a per-pupil cost of \$702.62.

The research demonstrates connections between hiring and retaining effective teachers with teacher salaries. Districts that pay lower salaries will likely have difficulties attracting and keeping effective teachers. The differences in salary schedules across school districts may result in unequal opportunities for students (Winters, 2009).

The highest paid teachers in low-poverty schools make over 35% more than those teachers working in high-poverty schools. The highest paid teachers are also more likely to experience easier working conditions such as smaller class sizes and more input into the decision-making in their districts (Loeb et al., 2005; National Center for Education Statistics, 1997).

Just as challenging for some districts is the ability to compete with neighboring school districts with higher teacher salary schedules. Districts that pay teachers less than surrounding districts find it difficult to hire and retain quality teachers when those same teachers are able to work in a nearby district for a better salary. Lentz (1998) concluded that in Illinois, teacher salaries increase with the property tax base per student. This is another indication that students who reside in wealthier homes are more likely to be enrolled in a school with highly qualified and effective teachers, which perpetuates the inequalities found in our educational system.

Teacher salaries are important in not only attracting teacher candidates, but also attracting quality candidates. Manski (1987) asserted that higher pay tends to attract “better-qualified” teachers to districts. Combat pay was first conceptualized to attract quality teacher candidates over 50 years ago and utilized in large urban districts to staff hard-to-staff schools with effective teachers. Districts are also implementing merit pay systems or other compensation systems to attract teachers (Strunk & Zeehandelaar, 2011).

Murnane and Olsen (1989, 1990) found a link between higher teacher salaries and a decrease in turnover rate. Ferguson (1991) and Figlio (1997, 2002) noted that school districts with higher salaries can hire higher quality of teachers who have graduated from selective universities and with backgrounds in specific subject areas. Maiden and Evans (2009) found that Oklahoma districts with a higher enrollment of poorer families typically spend fewer dollars to support teacher salaries on average. All of these factors play into the importance of teacher salaries and the ability to hire and retain highly qualified teachers.

Teacher salary is also an important factor in teacher satisfaction. Zhang et al. (2008) determined in an international study that a teacher's salary is the second-best indicator of job satisfaction behind only school climate. Job satisfaction in turn is a good predictor of retention. The researchers also noted that countries with a higher salary schedule typically have higher math assessment scores at the national level.

Over the last two decades, the idea of merit pay or performance pay has begun to gain traction as a way to attract and retain quality teachers. During this time, due to a high number of teacher retirements, growing student enrollments and reluctance of college students to enter the teaching profession, the teacher shortage has significantly increased and heightened the need for policy-makers and educators to address the issue (Ingersoll & Merrill, 2010). Merit pay alone may not be enough to attract new teachers to each district. These economic incentives will only be successful if the incentives are significant enough to convince teachers to move to less attractive districts. Specifically, districts with a high percentage of low-income students, minority students or less than ideal working conditions (Collins, 1999).

For example, combat pay, which is higher salary wages for teachers in urban schools, was an idea that began in Los Angeles decades ago. The idea behind combat pay was to attract

high quality teachers too difficult to staff schools. These same strategies are being implemented in rural areas and districts that struggle to hire and retain quality teachers due to wages, cultural or professional isolation (Collins, 1999).

A variety of performance pay incentive options exist such as one-time only bonus, ongoing pay bonuses, pay bonuses based on test scores above the median, pay bonuses based on test scores above other district teacher's scores, and pay bonuses based on student criteria such as attendance, grades, and graduation. Lavy (2007) noted that "tying teachers' pay to their classroom performance should improve the current educational system both by clarifying teaching goals and by attracting and retaining the most productive teachers." Teachers' unions are typically the strongest opponents to the development and implementation of performance pay programs (Figlio, 2002).

Researchers are beginning to examine the impact of performance pay programs for teachers. In 2005, the Houston Independent School District implemented an incentive-based award system, which drastically reduced the amount of staff turnover. The district witnessed a decrease in teacher turnover by 19% that school year. The district also offered \$7,300 in incentive pay for good attendance, which decreased the amount of teacher absences during the school year (Coates-McBride & Kritsonis, 2008).

During the 2006-2007 school year, the What Works Clearinghouse in three Little Rock, Arkansas schools completed a pilot study. The program provided performance pay bonuses in the range of \$50 to \$400 to teachers whose students showed increases in test scores. The study found higher increases in school that participated versus those schools that did not participate in the study (What Works Clearinghouse, 2008).

A number of other states have begun to implement performance pay systems. Minnesota, Colorado, South Carolina, Florida, and Arkansas have started the Teacher Advancement Program (TAP). The program aims to attract and retain high quality teachers by offering higher salaries and advance their careers while remaining in the classroom. California's Department of Education created a statewide program called the Certified Staff Performance Incentive Award Program which rewards teachers according to student achievement. The purpose of the program is to increase test scores in low performing schools throughout the state (Glazerman et al., 2006).

North Carolina implemented the Charlotte-Mecklenburg Performance-Based Pay Plan, which targeted 48 low-performing schools at the elementary and middle school levels. The goal of the program was to increase student achievement by rewarding teachers based on their attendance, student achievement and professional development. A similar program was implemented in Cincinnati called the Cincinnati Teacher Evaluation and Compensation System. The program replaced the traditional system of salary schedules based on experience and degrees with a system based on teacher evaluations. The new program measures teacher performance by classroom observations portfolio reviews which are tied into teacher pay (Glazerman et al., 2006).

Unlike the previous programs that created performance pay incentives based on student performance, Arkansas and Florida created teacher incentive programs to address the teacher shortage. Arkansas's High Priority District Bonus Program provided bonuses to teachers who accepted or stayed in teaching positions in small, rural districts. The goal attempted to assist districts in the Mississippi Delta region where 80% or more of the students are low-income and minorities.

Palm Beach County in Florida began the Title I Sign-On Incentive Program to recruit and retain teachers in schools eligible for Title I services. Palm Beach is currently the only district in the state implementing such a program (Glazerman et al., 2006).

### ***Certification***

The way that society in general has defined teacher quality has evolved over time. At the beginning of last century, teachers were judged by high moral character. After World War II, teacher effectiveness was based on curiosity, compassion, and enthusiasm. During the Cold War when the Soviet Union launched Sputnik, teacher effectiveness focused more on skills rather than personal characteristics. Teachers began to utilize questioning techniques, incorporating technology, lesson pacing and understanding different student learning styles. This era marked the beginning of linking student achievement to teacher effectiveness. The current definition of teacher quality is based on the need to acknowledge student diversity, increased rigor, and meaningful instruction (Maiden & Evans, 2009).

The No Child Left Behind (NCLB) Act of 2001 transformed the national public school system by raising student achievement levels in math and reading and subjecting districts to a series of sanctions for failing to meet the prescribed adequate yearly progress. As part of the Act, districts were required to staff classrooms with “highly qualified” teachers. NCLB defines “highly qualified” as those teachers who are experienced, certified, and have majors in their current subject area (Strunk & Zeehandelaar, 2011). Research indicates that teachers with full certification and a major in their field is a stronger indicator for student achievement than even a teachers’ level of education (Darling-Hammond, 2000).

Unfortunately, all too often the least qualified teachers are found in schools with the lowest performing students. For many years, highly qualified teachers have been inequitably

distributed in school districts across the nation. Research shows that schools with the highest percentages of low-performing, low-income and minority students also have the lowest percentages of highly qualified teachers (Boyd et al., 2008; Strunk & Zeehandelaar, 2011). Darling-Hammond (2000) reported that minority students in low-income schools are 3 to 10 times more likely to have teachers who are not certified or teaching outside their field of preparation than students more affluent and predominately white schools.

Further research in New York City schools has indicated that student achievement is negatively impacted most by an inexperienced teacher on a temporary teaching license, which is most commonly found in low-income schools with high-minority student enrollments. Due to a court order, New York City was mandated to significantly raise teacher salaries, which reduced the need to hire teachers with temporary licenses and enabled districts to retain teachers in high need schools. The researchers found that with higher percentages of certified, experienced and more prepared teachers the achievement gap between schools servicing the poorest and wealthiest students reduced by 25 percent (Boyd et al., 2008).

These inequalities appear to be unique to the United States. In an international study, Akiba et al. (2007) found that even though the teacher quality in the United States is similar to the average in other nations, the access to these highly qualified teachers between students of high and low socioeconomic status is among the largest gap in the world. Darling-Hammond (2000) pointed out that U.S. students historically score lowest in the academic areas in which U.S. teachers are least prepared. States that frequently lead the nation in mathematics and reading achievement are equipped with the most highly qualified teachers. These states have the most rigorous standards for teaching and enforce those standards throughout their education systems.

Salaries play an important role in providing students with highly qualified teachers. Adamson and Darling-Hammond (2012) found that in California a 1% increase in salary correlates with a 2% reduction in teachers with 3 or less years of experience, and a 3% decrease in the number of teachers working without the proper credentials. In New York, they found the same results. Ferguson (1991) concluded that every additional dollar spent on more highly qualified teachers leads to higher increases in student achievement and is more cost-effective use of school funds than on other school resources.

### *Experience*

Research has shown that a teacher's years of experience can make a difference on student achievement. A teacher with 10 to 15 years of experience produce student achievement gains 0.03 to 0.20 standard deviations higher than novice teachers. Most of the achievement gains from teacher experience typically occur within the first 4 years of classroom experience (Kane et al., 2006; Rivkin et al., 2005; Rockoff, 2004). Based on their meta-analysis, Greenwald et al. (1996) estimated that teacher salary increases were related with a 0.16 standard deviation increase in student achievement at a per-pupil cost of \$702.62.

Most studies have determined that teachers with less than 3 years of classroom experience are usually less effective than more experienced teachers, but those benefits tend to remain stagnant after about five years of experience. A number of reasons can impact this relationship such as more experienced teachers may not always continue to learn and may also grow tired in their profession. In other educational settings that promote continual improvement, veteran teachers may be more exposed to collaboration and professional development, which positively impacts their performance in the classroom (Rosenholtz, 1986).

## *Education*

NCLB raised the certification bar for teachers and school districts. Historically, most school districts would hire teachers who recently graduated from college or university-based teacher preparation programs. Many low-performing school districts were unable to recruit those same graduates for a variety of reasons, so they were forced to hire uncertified teachers in those districts. In 2001, NCLB required that states ensure that any teacher in a core academic subject such as math, reading, language arts, science, foreign languages, civics and government, economics, arts, history, and geography must be highly qualified to teach that subject area (Boyd et al., 2008).

The research on teacher certification and the impact on student achievement varies depending on the study. Three recent studies with strong research designs and data have found that certified teachers outperform unqualified teachers. The studies found that the achievement effect is approximately two to four percent of a standard deviation in math while the effect is about half that in the area of reading (Boyd et al., 2006; Clotfelter et al., 2006; Goldhaber, 2006).

Based on their meta-analysis, Greenwald et al. (1996) estimated that a teacher with a master's degree was associated with a 0.22 standard deviation increase in student achievement at a per-pupil cost of \$702.62 over those teachers with only a bachelor's degree. On the contrary, Murnane and Cohen (1985) found no relationship between degree type and teacher performance when comparing teachers with degrees in education versus teachers with degrees in disciplinary fields. Nonetheless, Monk (1994) found a positive relationship between student achievement in science and mathematics when considering a teacher's coursework in those fields, but the returns diminish above a threshold of five mathematics courses.

There is evidence that a teacher's degree level may matter in some specified circumstances. For example, in grades eighth through tenth, an increase in student achievement is not generally correlated with a teacher with an advanced degree. In math and science though a teacher with an advance degree in those subject areas does correlate with an increase in student achievement (Goldhaber & Brewer, 1997).

Monk (1994) had consistent findings as well in the research. Subject matter training in math and science predicts teacher quality in these areas. The research results suggest that each additional subject specific math course taken by the math teacher improves student performance by three quarters of one percent of a standard deviation in math and about two thirds of one percent in science.

There is little evidence of a similar relationship at the elementary level. Eberts and Stone (1984) found no statistical relationship between fourth grade students and the number of math courses taken by the teacher. Hill et al. (2005) also did not find a relationship in first and third grade teachers between student achievement and the number of math courses taken during their preparatory program.

### ***Attendance***

In 2017, Illinois required districts to publish teacher absences on the school report card. Each district reported the percentage of teachers who were absent less than 10 days each school year. This is another measure of accountability and transparency in the effort to increase student achievement. According to the Illinois School Report Card , during the 2009-2010 school year, 36% of teachers nationally were absent more than 10 days. In high schools, 33% of teachers were absent more than 10 days per school year, while that percentage is slightly higher at the elementary and middle school level. Evidence also suggests that schools with 90% or more

minority students are subjected to 3.5 times higher rates of teacher absences than schools with less than 10% of minority students (ISBE, 2018).

Woods (1990) found that teacher attendance significantly impacts student achievement. The author's research demonstrated that students who had been instructed by teachers with lower absent rates perform better on achievement tests than those students in classrooms with teachers who have high rates of absences. Another study by Manlove and Elliot (1977) found that the performance of the school was negatively impacted by high teacher absences. In this study the rating of each school in various academic areas decreased when teacher absences increased throughout the school year.

In more recent work, researchers completed a study of a large urban school district and in North Carolina and estimated that 10 additional absences for teachers reduced student achievement 1% to 3% of a standard deviation. The evidence demonstrates the importance of teacher attendance. For a school with a student enrollment of 500 students, with teacher attendance averaging 87% during a typical school year of 180 days, over 58,000 hours of instructional time are lost (Clofelter et al., 2009; Miller et al., 2008).

### ***Retention***

Studies show that teachers prefer working in schools with better working conditions and higher salaries. Recent research indicates that working conditions may even be a stronger factor than salary schedules for retaining teachers. Teachers are attracted to schools with students who are racially similar, low percentage of students who are poor and high achieving (Boyd et al., 2006).

Teachers prefer better facilities and a lesser workload. This tends to lead teachers away from schools with low-performing students who disproportionately attend school with poorer

facilities and greater workloads. Geography is a factor in teacher hiring and retention. Research indicates that 85% of teachers take their first job within 40 miles of their high school and in settings similar to where they grew up. The fact of the matter is that teachers are not interested in working with low-performing students (Boyd et al., 2008).

Teacher retention is a significant issue in public education. Almost 50% of new teachers leave the profession in their first 5 years. Teacher attrition rates at schools with a high percentage of low-income students is twice that at schools with lower poverty rates (Loeb & Darling-Hammond, 2005). Schools with low-performing and low-income students are at a disadvantage hiring and retaining teachers, which has a significant impact on improving student performance and closing the achievement gap.

### **Student Factors**

Socioeconomic and minority status and the gap in student achievement has been a longstanding issue in the United States. Research has consistently shown that minority students score lower on standardized tests of math and reading skills than non-Hispanic White students. Also, students from low-income families score much lower on those same tests than students from higher income families (Reardon & Robinson, 2008). Despite decades of educational reform and numerous court cases at the state and federal levels fighting to combat inequalities in the educational system, the achievement gap based on socioeconomic status continues in the United States. That gap not only continues to exist, but research has shown that it is widening. There are a number of student factors that impact achievement, such as socioeconomic status, and attendance rates (Huang, 2015).

### *Low-Income Students*

Alexander & Wall (2008) reported that students in poverty have consistently been recognized to constitute a dominant educational burden for public schools. Most educators agree that low-income students warrant more educational funding than students above the poverty line. The most commonly utilized method to determine the number of children with greater educational needs as a result of low income is participation in the National School Lunch Program (U.S. Department of Agriculture, 2015).

In 2014, 30.5 million children received their lunch each day through the national program. Children from families with annual incomes at or below the 130% poverty level are eligible for a free lunch at school. Children who fall in the 130% to 185% level of poverty are eligible for a reduced-price lunch. For the period from July 1, 2013, through June 30, 2014, 130% was \$30,615 for a family of four and the 185% level was \$43,568 (U.S. Department of Agriculture, 2015).

In 2014, 44% of U.S. children lived in low-income families while in Illinois 41% of children lived in low-income families. In Illinois that includes 1,203,568 children who live in poverty (National Center for Children in Poverty, 2016). The “American Dream” assumes that people living in the United States are able to overcome obstacles such as socioeconomic status and succeed in this country through hard work and persistence. Yet the research tells another story for those children born into poverty. Reardon (2011) stated, “The achievement gap between children from high- and low-income families is roughly 30 to 40% larger among children born in 2001 than among those born 25 years earlier”( p. 1).

The Equality of Educational Opportunity Report, more commonly known as the Coleman Report, marked the beginning of wide interest by researchers, educators and policy-makers in the

achievement gap by socioeconomic status. “Inequalities imposed on children by their home, neighborhood, and peer environment are carried along to become the inequalities with which they confront adult life at the end of school” (Coleman et al., 1966, p. 325). Over the past 50 years, researchers have continued to study this achievement gap via advanced statistical models and the research continues to demonstrate the significant relationship between SES and student achievement (Huang, 2015).

Almost four decades after the Coleman Report was published, the NCLB Act was passed into law. One of the goals of NCLB was to close the achievement gap between disadvantaged children and their more advantaged peers. Even with that groundbreaking educational reform, the achievement gap continues to grow. The research has determined a number of reasons that contribute to the achievement gap which the recent educational reforms have attempted to address (Huang, 2015).

The first barrier that was specifically addressed by NCLB was limited access for low-income students to highly qualified teachers (Akiba et al., 2007). Schools with a high proportion of low-income students typically have the lowest proportion of highly qualified teachers. Students from low socioeconomic backgrounds also tend to have parents who demonstrate limited involvement in the educational process (Barnard, 2004; DePlanty et al., 2007).

Another major barrier to overcoming the achievement gap is the self-fulfilling prophecy when teachers have lower expectations for students from low-income families (Madom et al. 1997; Rist, 1970). When this occurs, students tend to perform to those expectations. A final barrier occurs because schools typically track students and places low socioeconomic students into less advanced math courses (Gamoran et al., 1997).

Economists have long believed that a quality education is an important economic investment in the financial well-being of not only each individual but also the entire nation (Alexander, 2008). To accomplish this task, the U.S. must invest in the necessary measures to narrow and eventually close the achievement gap for all students. Berliner (2013) completed an extensive study on the achievement gap and echoed Reardon's (2011) results that the gap has been widening. Berliner (2013) argued:

I think everyone in the USA, of any political party, understands that poverty hurts families and affects student performance at the schools their children attend. But the bigger problem for our political leaders and citizens to recognize is that inequality hurts everyone in society, the wealthy, and the poor alike. (p. 23)

Research provides a number of suggestions on how to address the achievement gap. Huang (2015) listed a number of possible solutions such as training and preparing transformative school leaders, supporting curriculum enrichment and differentiation and providing all students access to highly qualified teachers.

### *Attendance*

School attendance is a necessity for learning. Students with poor attendance miss knowledge and critical instructional when not in front of their teachers on a daily basis. Missing school may lead to poor grades and further patterns of absenteeism (Phillips, 1995). Research has also found absenteeism to be a factor in high school dropouts (Archambault et al., 2009; Gleason & Dynarski, 2002; Suh et al., 2007).

Students who are chronically absent from school tend to start disengaging as early as first grade and then continue at increasing rates of truancy throughout their educational careers (Alexander et al., 1997; Barrington & Hendricks, 1989; Gottfried 2009). Freshman year attendance has been found to be a determining factor in classroom success and high school graduation (Allensworth, 2013; MacIvera & Messel, 2013).

According to the U.S. Department of Education Civil Rights Data Collection, in the 2013-2014 school year, about 6.5 million students or 13% of the student population in the United States were absent over 15 or more days of school. The numbers were highest amongst high school students and in about 500 schools nationwide, at least 30% of students were reported to be chronically absent (London et al., 2016). Chronic absenteeism has also been linked to a number of negative consequences after high school such as lower paying jobs, poorer health, a higher probability of a life of poverty and incarceration (Bell et al. 1994; Dryfoos, 1990; Hawkins & Catalano, 1995; Ingersoll & LeBoeuf, 1997).

The research also demonstrates that student attendance impacts performance on assessments. Lamdin (1996) reviewed data from elementary schools in Baltimore and found that high levels of student attendance positively influenced performance in reading and mathematics. Roby (2004) examined data from all Ohio public schools specifically for students in grades 4, 6, 9 and 12 and found strong correlations between student achievement and schools' attendance rates on the Ohio Proficiency Test. Roby also found that attendance rates were significantly lower in the schools that performed lower on those assessments. Parke and Kanyongo (2012) found that high school students who attended school more frequently had a higher mean score on the PSSA mathematics assessment than those students with poorer attendance.

### ***Graduation Rates***

Graduating from high school and attaining a diploma is a necessary component for any students who choose to continue their education in college or elect to enter the workforce. The strongest student traits that a student will not graduate from high school include family structure, family stress (divorce, death, and transient), socioeconomic status, and mother's age. Low

socioeconomic status has demonstrated to be the strongest predictor of high school dropouts (Illinois Department of Education, 2018).

The high school graduation rate has been on the rise for the past 14 years since 2004. According to the U.S. Department of Education (2018), 86.5% of seniors graduated from high school in 2017. The high school graduation rate across the country that year was 84.6%, so Illinois was slightly above the average. Notable gains in various groups of students such as Hispanic, Black, low-income, and students with disabilities is responsible for the increase during that time.

Unfortunately, huge gaps still exist when comparing these groups to the national average. Most schools across the nation have graduation rates above 90%, but a disproportionate number of students who do not graduate attend schools with graduation rates below 50%. Black, Hispanic, low-income, and students with disabilities are overrepresented in those schools. When considering the graduation rates for low-income students, Illinois graduates 73% of the students in this category and is slightly below the nation average at 73.3% (Governing, 2012).

The Bureau of Labor Statistics found that weekly median annual earnings in 2014 for a high school dropout were \$488, \$668 for a high school graduate, and \$1101 for a college graduate with a bachelor's degree. Multiplying those weekly figures by 52 and the annual earnings for a high school dropout were \$25,376 compared with \$34,736 for a high school graduate and \$57,252 for a college graduate (see Table 1).

**Table 1***Earnings and unemployment rates by educational attainment*

Education attained	Unemployment rate in 2014 (Percent)	Median weekly earnings in 2014
Doctoral degree	2.1	\$1,591
Professional degree	1.9	1,639
Master's degree	2.8	1,326
Bachelor's degree	3.5	1,101
Associate's degree	4.5	792
Some college, no degree	6.0	741
High school diploma	6.0	668
Less than a high school diploma	9.0	488
All workers	5.0	839

*Note.* Data are for persons age 25 and over. Earnings are for full-time wage and salary workers. Source: Current Population Survey, U.S. Department of Labor, U.S. Bureau of Labor Statistics

The table demonstrates the importance of a high school diploma and beyond. For a family of four, the poverty line is \$24,250 across the nation in 2015. A high school dropout is just above that line and would struggle to support a family of four. High school dropouts also face other negative consequences such as a higher incidences of unemployment, health issues and incarceration.

The fallout from these factors impact not just the individual but all of society. Martin and Halpern (2006) estimated that the costs associated with poor health and criminal activity for male high school dropouts between the ages of 25 through 34 is around \$24 billion. The loss of lifetime revenue for this same group is approximately \$944 billion. Given the impact on the American society, it is critical that educators work with high-risk students to increase the graduation rates.

Lee and Polachek (2018) found that an increase in educational spending was one determining factor in increasing high school graduation rates. A strong case should be made with

policy-makers and taxpayers that spending more money up front on education will save communities and society as a whole in the long term. If we invest in our youth now it will pay dividends in the future.

### **Educational Spending**

Public schools were created not just to teach children how to read and write, but to provide universal education and maintain a virtuous government (Alexander et al. 2015). Initially, the educational system that was formed mirrored the class-orientated system in England and did not provide education for all children. The original education system was funded primarily through voluntary contributions.

The Massachusetts lawmakers passed the Old Deluder Satan Act of 1647, which was the beginning of publicly funded education in the U.S. (Noble, 1935). This Act required towns with over 50 families to establish an elementary schoolhouse to educate the children of each community. It required schools to teach students reading, writing, and Latin with the primary purpose of ensuring everyone was able to read the Bible.

In the 1700s Americans began to recognize that education was crucial to preserving freedom. Later that century, with the founding of the United States, the Constitution did not include a provision for education. This exclusion left public education up to each state. During the next century, access to education for all children began to become more prevalent. Horace Mann championed a system of education that was free for all students. From 1870 through 1920, the transition from private to public schools increased. Also, during that time, the number of students attending college from a public high school rose from 30 percent in 1872 to 90 percent in 1920 (Alexander & Alexander, 1985).

Since the Coleman Report was released in the 1960s, the relationship between spending and student achievement has been a greatly contested debate with researchers, policymakers, educators, parents, and taxpayers. During the 1919-20 school year, over \$970 million was spent on education. Today, that figure has risen to over \$600 billion (Digest of Education Statistics, 2015). The state's average per-pupil instructional spending has increased over the past five years from \$6824 in 2011 to \$7712 in 2015 (Illinois Interactive Report Card, 2015). Instructional spending includes only those funds directed towards student learning or interactions between teachers and students.

The highest achieving nations throughout the world equally fund all schools and pay teachers comparable salaries. Nonetheless, the U.S. has large inequalities in school funding and teacher salaries. The highest-spending districts in the U.S. spend approximately 10 times the lowest spending districts. Adamson and Darling-Hammond (2012) found that in the state data set they examined that during the 2008-09 school year a number of districts in New York spent as much as \$54,000 per pupil on the high end, while in California a number of districts spent as low as \$6000 per pupil that same year.

Across the nation, the spending differences are even wider. In 2015, New York, which is the highest spending state in the U.S. at \$18,719 per student, spent almost three times more on average per pupil than Idaho at \$6,277 per student. It is also important to note that funding rankings remain relatively stable over time. One recent notable exception is Illinois. Since 2007, Illinois's funding rank has improved from 28th to 16th (Baker et al., 2018).

In the National Report Card, Baker et al. (2018) attempted to study the important question of whether a state's funding model recognizes the need for additional resources and support for students in low-income schools. The study identified states as progressive if high

poverty (30%) districts receive a minimum of 5% more funding over low poverty (0%) districts and regressive if high poverty districts receive 5% less funding than low poverty districts. Illinois ranked 49th and is one of the most regressive States. Illinois students in high poverty districts get less than 75 cents for every dollar received by their low poverty counterparts. Illinois received a Grade “F” for funding distribution on the National Report Card.

Greenwald et al. (1996) conducted a meta-analysis of 60 research studies and found that even moderate increases in educational spending may be associated with significant increases in student achievement. Lee and Polachek (2018) posited that an increase in per-pupil spending leads to an increase in high school graduation rates. Darling-Hammond (2000) reviewed the outcome of Connecticut’s Educational Enhancement Act in 1986, which poured \$300 million into teacher salaries and allowed the lower wealth districts to compete for higher qualified teachers. At the same time, Connecticut increased the licensing standards for the profession as well as professional development requirements. The students in Connecticut demonstrated strong gains in mathematics following that investment in education.

A number of other states have also demonstrated strong gains in student achievement after investing large amounts of money in the educational systems. Kentucky experienced substantial achievement gains in the 1990s after implementing a major systematic reform in the 1980s. The reform initiatives included school funding equalization, large increases in teacher salaries, and increases in overall educational spending. During this same time period, Arkansas and West Virginia also invested large sums of money into their educational systems by increasing teacher salaries and raising licensing requirements. Both of these states experienced larger gains in student achievement than the national average (Darling-Hammond, 2000).

## **Educational Spending in Illinois**

Article X of the Illinois State Constitution states, “The State has the primary responsibility for financing the system of public education.” There must be “an efficient system of high-quality public educational institutions and services. Education in public schools through the secondary level shall be free.”

In 1927, Illinois was the first state in the nation to adopt the Strayer-Haig foundation formula. This equalization state aid formula remained in use for over forty years, but came under criticism in the late 1960s and early 1970s. It was felt that the level of educational funding was too low and it did not provide enough equalization across the state’s districts. The state reformed its finance system in 1973 when policymakers created the Resource Equalizer, which was a guaranteed tax base formula. This was expected to provide relief to the local property tax base and increase equity in school spending. In 1980 changes were made again to the finance system. The Resource Equalizer was converted into a foundation formula, a new Alternate Method was added for moderately wealthy districts, and the state retained a flat grant for the wealthiest school district across the state (Ward, 1987).

Educational funding in the U.S. comes from federal, state, and local sources. Federal tax revenue sources are generated from individual income taxes, corporate income taxes, and excise taxes. Federal revenue specific programs include Title I, special education, and the National Science Foundation.

State revenue sources are produced from individual income taxes, corporate income taxes and sales taxes. In the state of Illinois, school districts receive revenue from the state based on the state aid formula and categoricals. The three parts to the state aid formula are the foundation formula, alternate formula, and the flat grant formula. Schools also receive money based on

categoricals such as special education, transportation, and early childhood (Illinois Interactive Report Card, 2015).

The equalization Formula Grant is the primary funding system for the state and the formula takes into consideration local wealth when determining funding. The amount of funding will vary inversely with local property wealth. In this formula the State sets the statutory Foundation Level. The formula pays the difference between the set Foundation Level and a district's local resources per-pupil. The goal of this funding formula is ensuring every school district provides a minimum level of funding for each student through a combination of local and state funds (Education Funding Advisory Board, 2015).

In 2010, Illinois set the Foundation level to \$6,119 (Education Funding Advisory Board, 2015). The formula has been frozen at that amount for several years until it was changed with the Evidence-based funding formula, which was passed into law by Governor Rauner with Public Act 100-0465 Student Success Act on August 31, 2017 (ISBE, 2020)

The other state funding system in general state aid is the Poverty Grant. This system awards school districts funds based on the percentage of low-income students. These students are defined as those who receive services from the Illinois Department of Human Services through one of four programs: Medicaid, Food Stamps, TANF and the Children's Health Insurance Program. The amount of educational funding increases as the percentage of low-income students within the district increases. Any district with less than 15% of students classified as low-income receives \$355 per pupil while all other districts vary based on the following formula: (% of Low-Income Students) x \$2,700 + \$294.25. The Poverty Grant is not equalized so even the wealthiest school districts receive some amount of funding (Education Funding Advisory Board, 2015).

Local tax revenue sources are generated from property taxes and sales taxes. The calculation of property taxes in Illinois involves two variables. The first variable is the Equalized Assessed Valuation of Property (EAV). The township assessor assigns a valuation of the given property. The EAV is 1/3 of the actual value of the property. The second variable is the tax rate. Property taxes are calculated by multiplying the EAV of property by the tax rate. These rates are established per \$100 of EAV (Illinois Department of Revenue, 2016).

To complete the process, school districts are required to adopt an annual tax levy in order to access local property tax dollars. The first step of the levy process involves estimating the district's EAV. Once an estimated EAV is determined, the school officials then estimate the tax rate. A referendum is generally required for an Illinois school district to increase the tax rate above the minimum amount. Since the EAV is an estimate, many school districts will balloon the levy request slightly in order to ensure that the district accesses all available property tax revenues (Illinois Department of Revenue, 2016).

The funding system creates large funding differences between wealthy and impoverished communities, because approximately half of the revenue for school funding is provided from local property taxes (Biddle & Berliner, 2002). In 2012-13, over \$600 billion was spent on education across the nation. Illinois school districts received 26.8 billion dollars, 65.3% from local sources, 26.1% from state sources, and 8.6% from federal sources. The 65.3% of revenue from local sources was substantially higher than the national average of 45.5% (Digest of Education Statistics, 2015). Illinois relies heavily on local property taxes to fund schools, which creates an inequitable system based on property wealth instead of the wealth of the state. Educational opportunities differ for students throughout the state based on their neighborhood.

According to the Illinois State Board of Education 2014 Financial Profiles, 62% of Illinois' 893 school districts were deficit spending, which means the districts were using their reserves or borrowing money. That number almost doubled from the 32.5% of district deficit spending in 2008. Forty-nine districts had been identified to be in dire financial trouble. These school districts were on financial watch list, which means they have drained their financial reserves and borrowed money to pay for their daily operating expenses (Illinois State Board of Education, 2014).

The number of school districts on the financial watch list is likely only going to rise with the current economic state. The state legislature is cutting school aid in an effort to balance its budget, which will continue to have a profound impact on school districts across the state. In 2012, Illinois failed to fully fund the GSA by \$231 million and then fell \$518 million short of fully funding GSA the following year (Education Funding Advisory Board, 2015). School districts in impoverished areas were hit especially hard because they rely on state aid more than districts located in wealthier areas. Inequalities between school districts will continue to increase due to the current economic state.

Policymakers in Illinois have a challenging task when attempting to change the educational finance system. The state consists of three different types of school districts: elementary, high school, and unit, and has hundreds of school districts throughout the state. A change to the funding formula will likely favor certain districts and harm others, which pits policymakers against one another. Ward (1987) asserted that these differences in the system create regionalism in school finance politics. The Chicago suburbs consists of mainly elementary and high school districts while unit districts are common in most of downstate Illinois.

## **School Accountability**

The current school-based accountability initiatives began in the 1980s with the standards-based reform movement (O'Day & Smith, 1993). The purpose of the movement was to align curriculum to the standards and establish high expectations for students to meet those standards. Assessments were then aligned to measure student progress towards mastery of the established standards. The goal is to measure student achievement and the effectiveness of the schools (Figlio & Ladd, 2008).

School-based accountability became an increasingly popular public debate with the implementation of NCLB in 2002. This law required states to test students in grades 3 to 8 and one grade level in high school in the subject of reading and math. Schools were also obligated to report whether their students and subgroups of students were making adequate yearly progress toward the ultimate goal of 100% by 2014 (Figlio & Ladd, 2008).

Accountability only increased when President Obama and U.S. Secretary of Education Arne Duncan implemented the Race to the Top (RTTT) initiative in which the federal government allocated \$4.35 billion to award to states meeting specific educational policies. With Illinois' new Evidence Based Funding (EBF) system and the recent federal education reforms, policy-makers, taxpayers, parents, and educators are all interested in determining if the billions of dollars being allocated to districts is making a positive impact.

Related to that question is whether or not these accountability systems are actually measuring the right outputs. The traditional means of measuring student growth and achievement does not necessarily measure the effectiveness of each school. To examine if schools are using their available resources effectively, the "education production function" model requires student characteristics such as their family background and wealth status must be taken into

consideration along with teacher characteristics such as their qualifications and licensure (Figlio & Ladd, 2008).

### **SAT Student Achievement Data**

High school students in grade 11 take the SAT every year in the spring. Since 1926, millions of potential college students have taken the SAT for entrance into college. In 2017, over 1.8 test takers were administered the SAT. The SAT is a standardized assessment designed to measure basic reading, math and writing skills. The SAT is designed by the College Board, which is a mission-driven not-for-profit organization. Most colleges and universities utilize SAT scores for admission procedures (SAT, 2018).

Previously, the American College Testing (ACT) served as the state assessment test for 14 years until 2015 when the Illinois State Board of Education selected the SAT to serve as the official state assessment at the high school level. High school juniors began taking the SAT in 2016.

According to the SAT Technical Manual (2017), the primary focus of the SAT is to evaluate the degree to which students are prepared for college success. The SAT consists of two sections and an optional essay section. The evidenced based reading and writing section includes a reading test and a writing and language test. The last section includes a mathematics test. The SAT allows test takers three hours to complete the exam.

In 2015-16, the College Board introduced the newly redesigned SAT. “The SAT features a continued emphasis on reasoning, alongside a clearer, stronger focus on the knowledge, skills and understandings that are the most important for college and career readiness and success” (College Board, 2017, p. 2). The SAT provides a scale score between 400 and 1600. The scaled

scores from the Evidenced Based Reading and Writing subtest and the Math subtest range from 200 to 800. The SAT has proven to be a both reliable and valid assessment measure.

### **Illinois Research**

Lawrence (1990) completed a study of unit districts in Illinois across 4 years from 1986 through 1989. The study analyzed the relationship between per pupil expenditures and the mean ACT scores for each district. By using a bi-variate relationship test, the author determined that ACT scores increase as per-pupil expenditures increase in unit high schools. Lawrence determined that the relationship was negative in three of the four school years. The author conducted a One-way Analysis of Variance with ACT scores as the dependent variable and the size of the district as the independent variable. Lawrence concluded that large high schools and unit districts tend to perform better on standardized achievement tests than smaller schools.

Perkins (1992) studied the relationship between educational spending and student achievement. The study included 50-unit districts in 13 counties near St. Louis. He analyzed the top two quartiles of eighth grade students from the Illinois Report Card in 1987 and the operating expenditures per pupil. The research found no significant relationship between expenditures and student achievement in reading or mathematics.

In another Illinois study, Grace (2002) completed a study to determine if a correlation existed between student achievement and various programmatic costs. The study spanned from 1994 through 1998 and examined the 50 largest unit districts in Illinois. A Pearson product-moment correlation for programmatic costs and regression analysis was conducted to identify the factors not related to those costs. The results indicated a significant positive correlation exists between student achievement and direct instruction.

Lastly, Oberhaus (2008) researched the relationship between student achievement and instructional expenditures. The author utilized a Pearson product-moment correlation analysis. Similarly, to the previous research, Oberhaus found a small positive correlation in 4 of the 5 years of the study. The implication is that when the per pupil expenditures are increased, student achievement slightly increases.

### **Allocative Efficiency Framework**

This study used the allocative efficiency framework lens to determine if school districts are getting the most out of their spending. The framework examines multiple educational inputs and outputs to examine how best to spend tax dollars to provide a successful education for its students (Knoepfel et al., 2007).

Allocative efficiency is only truly achieved when resources are allocated to maximize the welfare of the entire community (Drummond, 1991). This study builds on the idea that educational funding is a critical piece to narrow the achievement gap, but how that money and specifically which resources it is spent on is critical to impact student achievement.

### **Study Design**

For the past two decades, Illinois has attempted to rectify inequalities within the educational system. Before the turn of the century, state lawmakers began to examine the funding system for schools to better support all students and narrow the achievement gap. The methodology implemented in this study utilized a very similar research design and extends the work of Augenblick and Myers (2001).

In December of 1997, Public Act 90-548 created the Illinois Education Funding Advisory Board (EFAB), which was charged to make recommendations to the General Assembly for the foundation level, and supplemental general State aid grant levels for districts with high

concentrations of children from poverty. “The recommended foundation level shall be determined based on a methodology which incorporates the basic education expenditures of low-spending schools exhibiting high academic performance (EFAB, 2016, p. 2).” Members of the Board include representatives from business, education, and the public.

At that time, EFAB was attempting to address NCLB, which required all districts to demonstrate that all students would meet state standards and achieve at high levels by 2014. In the 2002 report, the Board asserted that NCLB would be impossible to meet with the system of funding that was in place at the time. A few of the pertinent points listed in the report included the following;

- Average school district classroom teacher salaries range from less than \$24,000 to more than \$83,000.
- The formula foundation level of support is \$4,560, over \$1000 less than is recommended to assure adequate funding.
- Tax rates vary from less than 1.00% to over 8.00%.
- Per pupil spending ranges from less than \$4,000 to in excess of \$15,000.
- 61% of Illinois school districts spend in excess of revenues.

Illinois is a low tax state and the total tax burden as a percentage of personal income is 13.9%, which ranks it second to last in the nation at that time. Illinois’ share of public education revenues is 37%, ranking in the bottom three states in the nation. EFAB stated that the funding system is not in the best interest of the state and harming the students in public education (EFAB, 2013).

EFAB considered further research before making recommendations. Poverty largely accounts for variation in achievement. Student achievement during each grade has an important impact on future success. A student who is struggling to read at the end of third grade is likely to never be able to catch up with grade level peers and will struggle throughout his or her schooling. An elementary student who does not master algebraic concepts will most likely not be

able to meet high school math standards. In addition, a student who does not meet Illinois Learning Standards by eleventh grade will find it challenging to succeed after high school in both post-secondary school and in the workplace (EFAB, 2002).

Research demonstrates that students face significant challenges when unable to achieve at a high level in school. Fifty percent of welfare recipients in Illinois are high school dropouts. In addition, thirty percent of prisoners in the state's Department of Corrections prisons cannot read at a sixth grade level. The state's testing data demonstrates concerning achievement gaps for low-income students. Almost 70% of the variation in test scores is attributable to the income status of children. EFAB made the argument that it is estimated to cost 1.2 times as much money to educate students in poverty because low-income students are at risk for academic failure (EFAB, 2002).

Based on the Augenblick methodology, beginning in the 2003-2004 school year, the General State Aid formula foundation level should be \$5,665. This designated amount represents a district weighted, CPI adjusted amount and cost an additional \$1.8 Billion. EFAB recommended that the foundation level each year forward should be calculated using the Augenblick methodology (EFAB, 2002).

At the time of the 2002 report, the EFAB also reviewed the property tax system and alternate revenue sources to fund schools. Illinois has one of the most unfair or regressive taxing systems in the nation. The wealthiest 1% income earners only pay 4.9% of their total income to taxes while the poorest 20% of income earners pay 13.5% of their total income. One of the flaws of the state taxing system is that the property tax burden in Illinois is significantly higher than the national norm while income and sales tax burdens are less. Constitutional restraints imposed on the income tax system creates an over reliance on property taxes in Illinois. The state creates

almost as much per person from property taxes as it does from the income and sales tax combined which is an unbalanced structure. Compared to other states, Illinois relies more on property revenue than Texas, which is a state that does not even have an income tax (EFAB, 2002).

EFAB went on to assert that as a state, Illinois is not economically competitive and because of that reason, the State is losing jobs and businesses to other parts of the country. The current taxing and school funding systems do not make sense so the committee included a number of recommendations in the report (EFAB, 2002):

1. Reduce reliance on the local property tax to fund public schools.
2. Guarantee real property tax relief.
3. Increase the state share of public-school funding with a reliable, predictable revenue stream.
4. Permit school districts to maintain or enhance current funding through local effort.
5. Develop state replacement revenue in a fair, efficient and reliable manner.
6. Balance tax burden and relief for businesses and individuals.
7. Reduce funding disparities between school districts.

In June 2001, EFAB utilized Augenblick and Myers of Denver, Colorado to create the methodology behind the recommendations for the Foundation Levels. The methodology identifies high performing, low-spending school districts along with specific variables from those districts such as assessments, demographics, and finances. Augenblick and Myers methodology evaluated the State's Foundation Level and estimated how the level should be adjusted to adequately reflect the cost of educating at-risk students (EFAB, 2002).

The Augenblick and Myers (2001) study indicated that levels of state aid for schools across the country is typically related to the availability of money, associated with the effort required to obtain it, not the resource needs of students or schools. States at this time are typically utilizing one of two models, which educators and policymakers have examined as ways

to determine a base cost for educating students across the nation. The professional judgment approach is the modern version of the resource cost model that required educators to identify the resource needs of quality schools. Once specific resources have been identified in this approach, a cost of those resources are determined and then combined with district level expenditures to produce an overall cost per student.

The second approach is the successful school model. This approach attempts to identify schools that have achieved strong academic performance and have spent less money than predicted based on location and demographics. Once districts have been identified, their basic spending is reviewed to determine a basic cost level. The Augenblick and Myers (2001) study used the successful schools' model to determine a base cost figure for Illinois and EFAB.

Augenblick and Myers (2001) gathered data for each elementary, high school and unit district in Illinois. In partnership with the ISBE, they created databases to utilize and identify successful schools. Within those databases school information included wealth and tax rates, enrollment and demographic information, and staffing information such as average teacher salaries, student to pupil ratios, and the average years of experience of teachers. The authors also collected student achievement data for a number of grades, subject areas, and over a number of years. Lastly, Augenblick and Myers identified proxies for identifying at-risk students.

Augenblick and Myers (2001) made several decisions as they constructed their model. They focused on test scores only and excluded other factors such as attendance rates and dropout rates. In past studies, they had found that non-test scores had little impact on the calculation of base cost figures. The model utilized 1999 and 2000 Illinois Standards Achievement Test (ISAT) for reading, writing and math tests for students in grades 3, 5 and 8. They chose to use either 1 year or 2 years of test scores, emphasizing a single year of scores in most models since the state

uses an absolute standard for success. For some alternatives, they used an absolute standard over time to meet the rising target of NCLB.

The next decision made in the successful schools' model was to target at-risk students based on the proportion of students eligible for free and reduced lunch. They identified districts within one-half of a standard deviation of the mean percent of at-risk students for each type of district, districts one-half standard deviation below the mean as well as above the mean. This method enabled the researchers to identify whether base costs are related to the proportion of at-risk students (Augenblick & Myers, 2001).

Augenblick and Myers (2001) identified a minimum standard of success, which consisted of districts in which 67%-83% of students meeting the ISAT expectations for success. Districts where more than 83% of students meeting the standard were excluded from consideration. The authors established a minimum level of student participation rate of 80% to make scores comparable to other districts as well as demonstrate being truly successful district.

A final consideration made for the Augenblick and Myers (2001) study involved developing a spending efficiency criteria so that results with and without the criteria could be studied. Using multiple regression, the researchers examined per pupil spending to create a predicted level of spending for each school considering their unique characteristics. Augenblick and Myers considered each school's enrollment, operating tax rate, property wealth per pupil, percent of students in special education, percent of students eligible for free and reduced lunch, teachers per 1,000 students and average teacher salary. A separate regression was completed for unit, elementary and high school districts. Districts were identified to be efficient if they were identified to have high percentage of low-income students and their spending levels was less than

the predicted level. All inefficient spending districts were excluded from the study. The researchers identified five districts to examine.

Once Augenblick and Myers (2001) identified successful school districts, it was then possible to calculate a base cost per pupil, which is the weighted average basic expenditure of those successful districts. The researchers had a difficult time obtaining this figure though for a variety of reasons. First, they attempted to utilize the state's tuition charge for each district, but did not consider this a viable option once they determined the figure to be higher than expected based on their work in other states. They then worked with ISBE to identify 12 successful districts that accurately represented districts across the state. In the end, they were only able to contact and obtain information from six of those districts, which was not considered a fair representation.

In the end, Augenblick and Myers (2001) decided to use the Geographic Cost of Education Index (GCEI) developed by the National Center for Education Statistics. The index adjusts for the differences in hiring teachers between districts and attempts to consider other costs that makes education in one district more expensive than others even when the resources are similar. NCES created figures for every district in the nation. Since the figures were somewhat dated, the researchers adjusted the numbers across the state for an average of 1.00.

Augenblick and Myers (2001) found the cost of education (COE) figures to be higher than the unadjusted figures, which indicates a few critical points. First, COE figures for elementary districts are lower than unadjusted figures, suggesting successful elementary districts are located in places with higher costs of living. Second, the spending at high school districts is higher than spending at unit districts. The researchers identified the base costs for elementary

districts to be \$4,650 with a slight decrease for unit districts at \$4,600. The base costs for a high school district was determined to be around \$7,700.

Based on those figures, Augenblick and Myers (2001) made a couple of conclusions. First, it is possible to calculate a base cost figure for Illinois Districts by analyzing basic expenditures that meet some set of student performance standards as well as some set of demographic characteristics. Second, since it is apparent using the tuition charge overstates basic expenditures, it is necessary to develop a procedure to determine the basic expenditure levels for districts.

Augenblick and Myers (2001) then reviewed the approach used in Illinois during their study. The foundation program is designed to provide a base level of support for all students. Its purpose is to provide sufficient funding to assure that students without special needs meet state standards. Obviously, all schools enroll students with special needs so it is imperative that a formula is in place to provide sufficient funding for these identified students as well.

Illinois is similar to other states in that it utilizes family income as a way to measure and provide funds for at-risk students. Many states also provide funds to support at-risk students through categorical funding. In some states to receive that specified funding districts are required to demonstrate that money was used to lower class sizes, extend the school year, provide pre-school or full-day kindergarten or additional staff (Augenblick & Myers, 2001).

Augenblick and Myers (2001) created a methodology to calculate a level of support for at-risk students. In their approach, they determined it was possible to infer the amount being spent for at-risk students by using multiple regression to explain the variation in per-pupil operating expenditures. If a number of variables such as the proportion of students from low-

income families can account for the majority of per-pupil spending, then it is possible to predict the amount districts are spending for at-risk students.

During their study, Augenblick and Myers (2001) only completed regression analysis for the unit districts. In the first approach, the researchers excluded Chicago schools from the analysis. The model included the following: student enrollment, percentage of free and reduced lunch students, percentage of special education students, the GCEI, per pupil property wealth, the number of teachers per 1,000 students, the average teacher salary, and the operating tax rate of each district. This last variable helped explain the variation in per pupil spending for each district.

The resulting equation accounted for 76% of the variation in per pupil spending and indicated that districts are spending on average \$2,005 per at-risk student. Augenblick and Myers (2001) determined that when that at-risk amount is divided by the \$4,600 per pupil base cost figure, it provides a constant pupil weight of .44, which then could be applied to every at-risk student regardless of how many at-risk students are enrolled at each district.

Augenblick and Myers (2001) identified a second approach utilizing the same variables as the first approach but also included squared items for enrollment and at-risk students. The researchers' assumption is that there may be a curvilinear relationship between the variables and per-pupil spending. The corresponding regression equation explained 84% of the variation in per pupil spending.

### **Current Funding Recommendations**

Over the past 18 years, the EFAB has used the methodology created by Augenblick and Myers (2001) to make recommendations for Foundation Levels. The methodology is based on high-performing, low-spending school districts and factors in a number of district variables such

as demographics, assessments, and finances. For fiscal year 2018, the EFAB recommended that the Illinois General Assembly raise the Foundation Level to \$9,204. The recommendation would require \$4.6 billion in additional funding which almost doubles the amount from the previous year.

It is important to note that the state failed to fully fund the General State Aid claims the previous 6 years. In fact, from fiscal year 2002 through fiscal year 2016, the appropriated funds provided by the General Assembly were less than the amount needed to fully fund the General State Aid claims. State payments of statutorily owed claims to districts ranged from 87-99 percent of the designated amounts. The Illinois Constitution reads, “The State has the primary responsibility for financing the system of public education” (Article X). By continually failing to fund General State Aid claims, the State is failing the students of Illinois.

### **Gaps in the Literature**

Researchers have answered the question whether money matters in education. The extensive research clearly demonstrates that money makes a difference with student achievement. Further research is required to determine the most efficient means to allocate existing funds and new educational dollars (Verstegen & King, 1998). Considering all of the money that recent educational reforms, such as NCLB and RTTT have allocated towards the public school system, policy-makers and taxpayers are going to expect results. It is critical that researchers and educators determine which resources will provide the “best bang for our buck” in effort to provide all students with a quality education in an effort to improve student achievement.

## Summary

Education is a critical factor in a democratic nation and in creating a strong economy (Verstegen, 2008). Therefore, providing a high-quality education to all students in the U.S. is a must. A number of student and teacher factors impact student achievement in all school districts. As schools are being held to a high accountability standard, the research on these factors has come to the forefront of education policy and school funding discussions.

The use of state assessments are being utilized to measure student achievement and school effectiveness by comparing schools at the local, state, and national levels. Research has demonstrated that teachers are the most important factor when it comes to student achievement (Goldhaber, 2002; Rivkin et al. 2005). Students who have been assigned to highly effective teachers several years in a row have demonstrated greater achievement gains than those students who have been taught by less effective teachers (Sanders & Rivers, 1996).

A number of teacher characteristics or factors have been identified to have a positive influence on student achievement. Districts that pay higher teacher salaries are able to attract and hire higher quality of teachers (Manski, 1987; Figlio, 2002; Ferguson, 1991). Teacher certification also has demonstrated to be a strong indicator for student achievement (Darling-Hammond, 2000). Unfortunately, the schools with the highest percentages of low-performing, low-income and minority students also have the lowest percentages of highly qualified teachers (Boyd et al., 2008; Darling-Hammond, 2010; Strunk & Zeehandelaar, 2011).

Teacher experience can also factor into student achievement, but most of the achievement gains typically occur within the first 4 years of classroom experience (Rockoff, 2004; Rivkin et al., 2005; Kane et al., 2006). Teacher attendance has also been demonstrated to be an important factor in the discussion. Teachers with lower absent rates instruct students who perform better on

achievement tests than those students who were instructed by teachers with higher rates of absences (Woods, 1990).

Student factors such as socioeconomic status and attendance are important components to consider in the accountability discussion. Historically students in low-income families score much lower on standardized tests of math and reading skills than students from wealthier families (Reardon & Robinson, 2008). Just as concerning is the evidence that the achievement gap is actually widening for these groups of children even with all of the educational reform movements that have intended to address this concern (Huang, 2015; Reardon, 2011).

A number of reasons have been identified to have contributed to this widening gap such as limited access for low-income students to highly qualified teachers (Akiba et al., 2007), limited educational involvement from parents in low-income families (Barnard, 2004; DePlanty, Coulter-Kern, & Duchane, 2007), and schools tracking low-income students by placing them into less advanced courses (Gamoran et al., 1997).

Student attendance rates are another critical piece to the student achievement discussion. Students with poor school attendance miss out on important instructional time when not in front of teachers on a daily basis. Student absences may lead to poor grades and further patterns of absenteeism (Phillips, 1995). Chronic absenteeism has also been linked to a number of negative consequences after high school such as lower paying jobs, poorer health, and a higher probability of a life of poverty and incarceration (Bell et al., 1994; Dryfoos, 1990; Hawkins & Catalano, 1995; Ingersoll & LeBoeuf, 1997).

The previous and current educational reforms have required all schools be held accountable for student achievement scores. Researchers, educational leaders, and policymakers are all focused on closing the achievement gaps and providing students with high quality schools

and a good education. Research has clearly demonstrated that money matters in education and funding education is a critical piece to ensuring quality schools for all students. The research has also demonstrated specific educational inputs that are important in the educational process; however, further research is required to analyze the relationship more deeply between those inputs, educational spending, and student achievement in the state of Illinois.

## CHAPTER 3: METHODOLOGY

### Introduction

The purpose of this a quantitative, nonexperimental study was to determine if a relationship exists between SES, student enrollment, student attendance rate, graduation rate, instructional spending per pupil, average teacher salary, teacher education, teacher attendance, teacher retention, and achievement for all Illinois High School Districts as indicated on the Illinois School Report Card.

This chapter contains the following: the study design; research questions; data collection methods; and data analysis. At the end of this chapter, the methodology will be summarized and a preview of Chapter 3 is provided.

### Study Design

The research design of this study was a quantitative, nonexperimental ex-post facto longitudinal study to investigate student and teacher factors in Illinois high school districts related to student achievement. Quantitative research methods were appropriate for this study because the data were analyzed using statistical procedures to examine relationships among variables. Creswell (2008) defined quantitative research as, “a means for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures” (p. 4). In an ex-post facto longitudinal research study, the data is gathered retrospectively over the course of time (Krathwohl, 2009).

This study involved examining data sets available from the years 2017, 2018, and 2019 school years. Descriptive and inferential statistics were used by this researcher. Descriptive

statistics such as measures of central tendency, range, and standard deviation are used to summarize large batches of data to describe patterns (Krathwohl, 2009).

Inferential statistics compare two or more groups of data to determine if a significant relationship exists. The purpose of inferential statistics is to generalize the findings beyond the actual data sets. Confidence intervals are typically reported with statistics to express the researcher's confidence that the interval includes the population value and any differences are not due to random chance (Huck, 2004; Krathwohl, 2009).

In this study, the independent variables were student characteristics such as instructional expenditure per-pupil, student socioeconomic status, student attendance rate; teacher characteristics were defined as teacher education, teacher salary, teacher retention and teacher attendance. The dependent variables were the SAT composite scores and graduation rates for high-schools districts in Illinois for 2017, 2018, and 2019 school years.

The study was framed as proscribed by the Allocative Efficiency framework. Knoeppel et al. (2007) used allocative efficiency as a conceptual framework in their study on the relationship between resources and student achievement. This framework examines a variety of educational inputs and outputs and determines whether the correct inputs were used to achieve the desired results.

### **Measurement Instruments**

All data used in this study was downloaded from the Illinois School Report Card. The independent variables for the study—instructional expenditure per-pupil, student economic status, student attendance rate, teacher education, teacher salary, teacher retention, teacher attendance, and teacher evaluation for all Illinois high schools—came from the Illinois Report Card. The dependent variables, graduation rates along with the SAT composite score of each

high school district in Illinois from 2017 through 2019 school years also were obtained from the Illinois Report Card.

Illinois students in eleventh grade are annually required to participate in the SAT exam as part of the state assessment. The SAT Technical Manual (2017) states that the primary purpose of the SAT exam is to predict student success in postsecondary education. The SAT is a standardized test for admission into colleges and universities across the United States. The test originated in 1926 and is created by the College Board, which is a not-for-profit organization. The latest SAT version was updated in March of 2016.

According to the SAT Technical Manual (College Board, 2017), the SAT consists of an evidence-based reading and writing section, a math section, and an optional essay section. The test takes 3 hours to administer with an additional 50 minutes for the optional essay test. The updated SAT continues an emphasis on reasoning along with a clearer, stronger focus on the knowledge, skills, and understandings that are the most important for college and career readiness and success. The new SAT also places a greater emphasis on the meaning of words in extended contexts.

The new version of the SAT includes an updated scoring system. The new scale ranges from 400 to 1600 with a scale of 200-800 for evidence-based reading and writing and a scale of 200-800 for the math section. Students only receive points for correct answers and are not penalized for incorrect or blank sections.

### **Validity and Reliability**

Validity determines whether the scores from the instrument are able to be interpreted to meet the intended use of the test (Cresswell, 2009; Krathwohl, 2009). According to the SAT Technical Manual (2017), the 2016 version of the SAT was intended to “assess the skills,

knowledge, and understandings that matter most for college and career readiness and, in turn, the resulting scores from the assessments are intended to be interpreted in regard to a student's readiness for college and career training programs (p. 108).”

A predictive validity study was completed across a diverse sample of first-year college students in 15 different institutions. The study determined that the new SAT scores continue to be as predictive to student success in college as the old SAT scores. The results also demonstrated a high relationship to SAT scores and GPA during the first year of college (SAT Technical Manual, 2017).

Reliability demonstrates the consistency of the measurement (Krathwohl, 2009). According to the SAT Technical Manual (2017), to measure the consistency of test scores the test developers used the Kuder-Richardson 20 (KR20). KR20 is an estimate of internal consistency, specifically useful when all items are dichotomously scored and the parts are essentially tau equivalent (Haertel, 2006). The results indicated high consistency in reliability with estimates slightly higher for males than females and are similar across subgroups (SAT Technical Manual, 2017).

The Illinois State Board of Education annually releases a report card for each school district in the state to publicize comprehensive information on academic progress, school environment, student demographic information and educator information. The report card provides two formats for the public to review. The at-a-glance view provides a one-page overview about the district, while the online version provides in-depth information about each indicator.

ISBE collects the information for the Illinois Report Card through statewide data systems such as the Student Information System (SIS) and other annual reports and surveys. School

principals are able to upload items under the highlights section at any time throughout the school year. According to state law, each Illinois district must publish a report card by November 30 of each year. Districts are mandated to present the report cards at a monthly board meeting, make the report cards available to the local media, and post the at-a-glance report card on the district website (Illinois Report Card, 2021).

### **Research Questions**

The purpose of this quantitative study was to determine if a relationship exists between SES, student enrollment, student attendance rate, graduation rate, instructional spending per pupil, average teacher salary, teacher education, teacher attendance, teacher retention, and achievement for all Illinois High School Districts as indicated on the Illinois School Report Card. The first two research questions pertained to student-related variables, whereas research questions 3 and 4 pertained to teacher-related variables. The research questions that guided this study were:

RQ1: Is there a relationship between instructional expenditure per-pupil, student socioeconomic status, student attendance rate, and *student achievement* as identified by the SAT for high school districts in Illinois in 2017, 2018, and 2019?

RQ2: Is there a relationship between instructional expenditure per-pupil, student socioeconomic status, student attendance rate, and *graduation rate* as identified by the Illinois Report Card for high school districts in Illinois in 2017, 2018, and 2019?

RQ3: Is there a relationship between teacher education, teacher salary, teacher retention, teacher attendance, teacher evaluation and *student achievement* as identified by the SAT for high school districts in Illinois in 2017, 2018, and 2019?

RQ 4: Is there a relationship between teacher education, teacher salary, teacher retention, teacher attendance, teacher evaluation and *graduation rate* as identified by the Illinois School Report Card for high school districts in Illinois in 2017, 2018, and 2019?

### **Data Collection**

The data for this study were collected from the Illinois School Report Cards across the years 2017, 2018, and 2019. Data for every public school in Illinois are released annually to demonstrate how each district and the state are progressing towards specified educational goals such as academic progress, school environment, student, and teacher characteristics.

The SAT composite score, which is a combination of the reading, writing and math subtest scores, student demographic data, and teacher characteristics are reported by district on the Illinois State Report Card. On the ISRC, student demographic data reported includes: instructional expenditures per-pupil, student socioeconomic status, student attendance rate, and graduation rate. The teacher characteristics data includes teacher education, salary, teacher retention and teacher attendance. The data collected was then downloaded into an Excel spreadsheet to track each specified category for every Illinois High School District for 2017, 2018, and 2019.

### **Data Analysis**

First, descriptive statistics, such as the range, mean, and standard deviation, were calculated for both the independent variables and dependent variables. Descriptive statistics are used to summarize sets of data while using as few summary values as possible. Measures of central tendency are used to describe where the bulk of the data lie and measures of variability describe how spread out the data is in general (Krathwohl, 2009).

Second, a Pearson-Product moment-correlation was calculated to determine the degree and directional relationships between the independent and dependent variables in this study.

Krathwohl (2009) defined the Pearson product-moment correlation:

[The Pearson product moment correlation is] commonly referred to just as the correlation and is represented by the symbol  $r$ . A number between zero and plus or minus 1.00 indicative of the strength of relationship between two variables where zero indicates no relation. Positive correlations indicate that they vary directly; negative ones, inversely. At plus or minus 1.00 they vary perfectly proportionally; between plus or minus 1.00 and zero, they vary increasingly imperfectly as zero is approached. (p. 387)

A relationship shown by the correlation does not indicate that the relationship is causal.

Lastly, an analysis of schools with a low percentage of low-income students and schools with a high percentage of low-income students was included in this study To identify the cutoff point to separate the districts into one of the two categories, a stem and leaf plot was run in SPSS to designate schools with 34% or more students identified as low income. A Pearson product-moment correlation, two-tailed test was conducted to examine the direction and strength of the relationship between schools with a high percentage of low-income students, instructional expenditures per students, average teacher salaries, teacher retention rate, teachers with a master's degree, graduation rates and students who performed at the meets and exceeds level on the SAT. The same correlations were then run between schools with a low percentage of low-income students and the designated variables. The correlations were run across all three school years.

### **Data Software**

The statistical analysis discussed in the study design section indicated the need for a software program to complete the statistical calculations. The SPSS software program includes appropriate features for creating scatter plots, regression analysis, ANOVA, and hypothesis

testing for correlation. Another important factor is that the SPSS program imports Excel spreadsheets.

### **Summary**

The purpose of this chapter was to provide clear understanding of the methodology used in this study. This study was a quantitative, ex-post facto longitudinal study regarding the relationships between student and teacher variables and their corresponding impact on student performance. This chapter included the research questions that guided this study along with an explanation of the instrumentation used, data collection procedures, and analyses.

Chapter 4 provides the results of the data analysis.

## **CHAPTER 4: RESULTS**

The purpose of this quantitative study was to determine if a relationship exists between SES, student enrollment, student attendance rate, graduation rate, instructional spending per pupil, average teacher salary, teacher education, teacher attendance, teacher retention, and achievement for all Illinois High School Districts as indicated on the Illinois School Report Card. The data were comprised of all published data from the Illinois State Board of Education website from the years 2017, 2018, and 2019 for the 97 high school districts in Illinois. The identified data elements were downloaded into an excel spreadsheet by school year and then downloaded into IBM SPSS Statistics version 26.

This chapter presents the results of the statistical analysis. First, a general discussion on the descriptive statistics for the data is explained. Then the results of each research question are analyzed and reviewed using descriptive and inferential statistics. The review of each research question includes a brief commentary on all of the significant findings and discussed further in the discussion section.

### **Descriptive Statistics**

One hundred four high school districts were included in the original data sheet for the 2017, 2018, and 2019 school years. The following seven high school districts were removed from the data set because none of those districts reported complete financial or assessment information: Illinois Department of Juvenile Justice 428, Illinois State University Laboratory School, University of Illinois Extension School, the Illinois Mathematics and Science School, Paris Cooperative High School, Bismarck Henning Rossville Alvin Cooperative High School and Southland College Prep Charter School. A list of the districts included in this study, including the designated Illinois County, can be found in Appendix A.

Student achievement was measured by the average total SAT score for each district. The Illinois report card defines the Meets and Exceeds categories as students who have demonstrated readiness for the next grade level/course and ultimately are on track for college and careers (Illinois State Report Card, 2019). The percentage of students who met or exceeded expectations for math and reading were summed and then averaged to attain a total SAT Meet and Exceed percentage score for each district. That procedure was replicated for all three designated school years.

It is important to note that included in this study were student and teacher attendance, which were used as variables in the research questions. These variables were included in the initial analysis, but no interesting or noteworthy correlations were found. This researcher concluded that the reason for this is attributable to “ceiling effects.” In other words, based on the high rate of attendance by students and staff, there were no effects on the other variables.

Table 2 demonstrates the range from the lowest performing district to the highest performing district as measured by the SAT total score. The range varied slightly across all three years from 72.75 in 2017 to an increase of 74.6 in 2019. Upon visual inspection, the mean also increased slightly from the first year at 36.5 to 39 in 2019.

**Table 2**

*Range of SAT Total Scores for School Years 2017-2019*

SAT Total Score	Minimum	Maximum	Mean
2017	8.25	81	36.5
2018	7	79.5	36.6
2019	9.4	84	39

The descriptive statistics indicate large disparities across high school districts throughout the state regarding the percentage of low-income students, per pupil spending, average teacher salaries, and teachers with master’s degrees. As indicated in Table 3, the percentage of low-income students ranged from 99.5% to 0.9% in districts in 2017. The differences were similar in 2018 with a range of 97% to 2.1% of low-income students. In 2019, low-income students ranged from 86.7% to 1.2%.

**Table 3**

*Percentage of Low-Income Students Range*

Low- income students	Minimum	Maximum	Difference
2017	0.9%	99.5%	98.6%
2018	2.1%	97%	94.9%
2019	1.2%	86.7%	85.5%

The large discrepancy in the percentage of low-income students across high school districts prompted this researcher to split districts during the statistical analysis. To identify the cutoff point to separate districts into one of two data sets, a stem and leaf plot was run in SPSS to designate schools with 34% or more students identified as low-income. By creating these separate data sets, this researcher was able to examine the impact of low-income students on the various teacher and student factors.

The per-pupil instructional expenditures listed in Table 4 demonstrates the direct cost of educating students at each high school. In 2017, the average per pupil instructional expenditure ranged from \$4,919 to \$15,535 with a difference of \$10,616. In 2018, the average per pupil instructional expenditure ranged from \$5,115 to \$15,912, which is a difference of \$10,797. In 2019, the range continued to increase from \$5,203 to \$16,345 for a difference of \$11,142. The 3-

year trend indicates that the gap between per pupil instructional expenditures is increasing across high schools.

**Table 4**

*Per Pupil Expenditures Range for Years 2017-2019*

Per pupil expenditures	Minimum	Maximum	Difference
2017	\$4,919	\$15,535	\$10,616
2018	\$5,115	\$15,912	\$10,797
2019	\$5,203	\$16,345	\$11,142

The average teacher salary, shown in Table 5 in 2017, ranged from \$42,204 to \$113,569, which is a difference of over \$71,000. In 2018, the average teacher salary ranged from \$43,630 to \$114,773. In 2019, salary ranged from \$44,261 to \$118,305, which is a difference of over \$74,000 between the highest and lowest paying schools. Not only is the difference in the average salary range very large, but it increased approximately \$3,000 over the course of the 3 years.

**Table 5**

*Average Teacher Salary Range for Years 2017-2019*

Average Teacher Salary	Minimum	Maximum	Difference
2017	\$42,204	\$113,569	\$71,000
2018	\$43,630	\$114,773	\$71,100
2019	\$44,261	\$118,305	\$74,000

This large discrepancy is highlighted because prior research (Adamson & Darling-Hammond, 2011; Darling-Hammond, 2007) found that teacher characteristics, such as ability and experience, correlates more consistently to student performance on achievement tests rather

than other characteristics. Verstegen and King (1998) earlier found that money *does* matter and makes a positive impact on academic achievement. Since teacher salary schedules in Illinois are based on experience and education, the differences in salary ranges may be significant in a district's ability to hire a teacher with experience and additional education.

Another statistic noted is the differences in the percentages of teachers with a master's degree in each high school. In 2017, it ranged from a high of 94.8% of teachers with a master's degree to a low of 19.8%. In 2018, one district had a 100% of its teachers with master's degrees, while one district only had 15.5% of its teachers with a master's degree. These statistics begin to establish the differences between high school districts across Illinois.

### **Research Questions and Analyses**

The four research questions for this study were:

RQ1: Is there a relationship between instructional expenditure per-pupil, student socioeconomic status, student attendance rate, and *student achievement* as identified by the SAT for high school districts in Illinois in 2017, 2018, and 2019?

RQ 2: Is there a relationship between instructional expenditure per-pupil, student socioeconomic status, student attendance rate, and *graduation rate* as identified by the Illinois Report Card for high school districts in Illinois in 2017, 2018, and 2019?

RQ3: Is there a relationship between teacher education, teacher salary, teacher retention, teacher attendance, teacher evaluation and *student achievement* as identified by the SAT for high school districts in Illinois in 2017, 2018, and 2019?

RQ4 Is there a relationship between teacher education, teacher salary, teacher retention, teacher attendance, teacher evaluation and *graduation rate* as identified by the Illinois School Report Card for high school districts in Illinois in 2017, 2018, and 2019?

To address RQ1, a Pearson product-moment correlation, two-tailed test was conducted to examine the direction and strength of the relationship between low-income students, instructional expenditures per students, average teacher salaries, teacher retention rate, teachers with a master's degree, graduation rates, and students who performed at the meets and exceeds level on the SAT.

In 2017, as indicated in Table 6, there was a weak, negative correlation between low-income students and instructional expenditures per pupil ( $r = -0.287, p < .01$ ). There was also a weak, negative correlation between low-income students and average teacher salary ( $r = -0.283, p < .01$ ). A moderate, negative correlation ( $r = -0.447, p < .01$ ) was also noted between low-income students and teacher retention. A moderate, negative correlation was noted between low-income students and graduation rates ( $r = -0.570, p < .01$ ). A large, negative correlation was noted between low-income students and students who met or exceeded expectations on the SAT reading and math tests ( $r = -0.769, p < .01$ ). There was a moderate, positive correlation ( $r = 0.540, p < .01$ ) between instructional expenditures per student and students who met or exceeded expectations on the SAT reading and math tests. This analysis suggests that the more money allotted to student expenditures is related to a higher percentage of students exceeding expectations on reading and math assessments.

**Table 6***Correlations for AY 2016-2017*

Variable	Low income %	Instr. exp. per pupil	Total SAT meets/exceeds	Teacher average salary	Graduation rate	Master's degree	Teacher retention
Low Income %	—	-.287**	-.769**	-.283**	-.570**	-.314**	-.447**
Instr. exp. per		—	.540**	.806**	.318**	.631**	.166
Total SAT meets/exc.			—	.505**	.663**	.417**	.395**
Teacher average salary				—	.386**	.775*	.341**
Graduation rate					—	.312**	.318**
Master's degree						—	.348**
Teacher retention							—

*Note.* \* Indicates  $p < .05$ ; \*\* indicates  $p < .01$

Similar trends were discovered when examining the 2018 data. A weak, negative correlation between low-income students and instructional expenditures per pupil ( $r = -0.262$ ,  $p < .05$ ). There was also a weak, negative correlation between low-income students and average teacher salary ( $r = -0.270$ ,  $p < .01$ ). A strong, negative correlation was noted between low-income students and students who met or exceeded expectations on the SAT reading and math tests ( $r = -0.819$ ,  $p < 0.1$ ). A moderate, positive correlation was found between instructional expenditures per pupil and students who exceeded expectations on the SAT reading and math tests ( $r = 0.507$ ,  $p < .01$ ). This analysis suggests that the more money allotted to student expenditures is related to a higher percentage of students exceeding expectations on reading and math assessments.

A moderate, negative correlation was noted between low-income students and graduation rates ( $r = -0.585, p < .01$ ). A moderate, negative correlation was also noted again between low-income students and teacher retention rate ( $r = -0.424, p < .01$ ). It is also important to note that a moderate, positive correlation ( $r = 0.540, p < .01$ ) between instructional expenditures per student and students who met or exceeded expectations on the SAT reading and math tests as indicted in Table 7.

**Table 7**

*Correlations for AY 2017-2018*

Variable	Low income %	Instr. exp. per pupil	Total SAT meets/exceeds	Teacher average salary	Graduation rate	Master's degree	Teacher retention
Low income %	—	-.262*	-.819**	-.270**	-.585**	-.286**	-.424**
Instr. Exp. Per		—	.507**	.821**	.295**	.642**	.228*
Total SAT meets/exc.			—	.540**	.643**	.444**	.453**
Teacher Avg. Salary				—	.330**	.773*	.437**
Graduation rate					—	.232*	.305**
Master's degree						—	.408**
Teacher retention							—

*Note.* \* Indicates  $p < .05$ ; \*\* indicates  $p < .01$

The data from 2019, presented in Table 8, also demonstrated similar trends. A weak, negative correlation between low-income students and instructional expenditures per pupil ( $r = -0.249, p < .05$ ) and low-income students with average teacher salary ( $r = -0.257, p < .05$ ). Once again, a strong, negative correlation was found between low-income students and students who

met or exceeded expectations on the SAT reading and math tests ( $r = -0.831, p < 0.1$ ). Upon visual inspection, the moderate correlation in the previous 2 years between low-income students and graduation rates increased to a strong, negative relationship ( $r = -0.711, p < 0.1$ ) in 2019.

A moderate, positive correlation was found between instructional expenditures per pupil and students who exceeded expectations on the SAT reading and math tests ( $r = 0.493, p < .01$ ). The 3-year trend analysis further suggests that the more money allotted to student expenditures is related to a higher percentage of students exceeding expectations on reading and math assessments.

**Table 8**

*Correlations for AY 2018-2019*

Variable	Low income %	Instr. exp. per pupil	Total SAT meets/exceeds	Teacher average salary	Graduation rate	Master's degree	Teacher retention
Low income %	—	-.249*	-.831**	-.257*	-.711**	-.321**	-.392**
Instr. exp. Per		—	.493**	.825**	.301**	.644**	.252*
Total SAT meets/exc.			—	.509**	.700**	.460**	.438**
Teacher average salary				—	.357**	.780**	.354**
Graduation rate					—	.291**	.370**
Master's degree						—	.379**
Teacher retention							—

*Note.* \* Indicates  $p < .05$ ; \*\* indicates  $p < .01$

## **Low Income Follow-Up Analysis**

Further analysis was completed to examine how relationships may change when districts are separated into schools with a high percentage of low-income students and schools with a lower percentage of low-income students. To identify the cutoff point, a stem and leaf plot was run in SPSS to designate schools with 34% or more students identified as low-income. A list of districts included in this study for all three school years can be found in Appendices B, C, and D. The list includes each district's student enrollment, low-income percentage, 4-year graduation rate percentage, and the total SAT combined meet and exceed percentage for each school year in this study.

As shown in Table 9, during the 2016-2017 school year 50 schools were identified with 34% or more low-income students. CCSD 218 in Cook County was at the top of the list with 99.5% of students identified as low income. Township HSD 211 had the highest student enrollment at 11,874 students while Armstrong Township HSD 225 had the lowest enrollment with 139 students. See Appendix B for the list of identified schools along with the corresponding descriptive statistics.

**Table 9***Correlations for Low-SES Schools with 34% or More Low-Income Students in AY 2016-2017*

Variable	Low income %	Instr. exp. per pupil	Total SAT meets/exceeds	Teacher average salary	Graduation rate	Master's degree	Teacher retention
Low income %	—	.172	-.627**	.089	-.370**	.123	-.460**
Instr. exp. Per		—	.205	.748**	.143	.742**	.027
Total SAT meets/exc.			—	.180	.439**	.081	.254
Teacher average salary				—	.228	.791**	.276
Graduation rate					—	.063	.213
Master's degree						—	.219
Teacher retention							—

*Note.* \* Indicates  $p < .05$ ; \*\* indicates  $p < .01$

As indicated in Table 10, the 2017-2018 school year, 49 schools were identified with 34% or more low-income students. Thornton Fractional Township HSD 215 was at the top of the list with 97% of students identified as low income. Township HSD 211 had 11, 841 students, while Armstrong Township HSD 225 had the lowest enrollment with 134 students. See Appendix C for the list of identified schools along with the corresponding descriptive statistics.

**Table 10***Correlations for Low-SES Schools with 34% or More Low-Income Students in AY 2017-2018*

Variable	Low income %	Instr. exp. per pupil	Total SAT meets/exceeds	Teacher average salary	Graduation rate	Master's degree	Teacher retention
Low income %	—	.190	-.646**	.157	-.253**	.148	-.348*
Instr. exp. per		—	.160	.811**	.030	.789**	.182
Total SAT meets/exc.			—	.212	.508**	.106	.365*
Teacher average salary				—	.154	.780**	.440**
Graduation rate					—	-.023	.171
Master's degree						—	.325*
Teacher retention							—

*Note.* \* Indicates  $p < .05$ ; \*\* indicates  $p < .01$

Presented in Table 11, during the 2018-2019 school year, 50 schools were identified with 34% or more low-income students. JS Morton HSD 201 in Cook County was at the top of the list with 86.7% of students identified as low income. Once again, Township HSD 211 had the highest student enrollment at 11,857 students while Armstrong Township HSD 225 had the lowest enrollment with 134 students. See Appendix D for the list of identified schools along with the corresponding descriptive statistics.

**Table 11***Correlations for Low-SES Schools with 34% or More Low-Income Students in AY 2018-2019*

Variable	Low income %	Instr. exp. per pupil	Total SAT meets/exceeds	Teacher average salary	Graduation rate	Master's degree	Teacher retention
Low income %	—	.187	-.664**	.106	-.449**	-.015	-.403**
Instr. exp. Per		—	.060	.809**	-.010	.783**	.179
Total SAT meets/exc.			—	.113	.513**	.097	.474**
Teacher average salary				—	.112	.809**	.264
Graduation rate					—	-.040	.345*
Master's degree						—	.274
Teacher retention							—

*Note.* \* Indicates  $p < .05$ ; \*\* indicates  $p < .01$

A Pearson product-moment correlation, two-tailed test was conducted to examine the direction and strength of the relationship between schools with a high percentage of low-income students, instructional expenditures per students, average teacher salaries, teacher retention rate, teachers with a master's degree, graduation rates and students who performed at the meets and exceeds level on the SAT. The same correlations were then run between schools with a low percentage of low-income students and the designated variables. The correlations were run across all 3 school years.

The 3-year span of data for schools with 34% or more low-income students demonstrated similar trends (see Tables 12, 13, and 14). Weak, positive correlations were noted between low-income students and instructional expenditures per student, average teacher salary and teachers

with a master’s degree. A moderate, negative correlation between low-income students and SAT reading and math scores was noted in 2017 ( $r = -0.627, p < .01$ ), 2018 ( $r = -0.646, p < .01$ ) and a strong, negative correlation was noted in 2019 ( $r = -0.664, p < .01$ ). The data indicates that the relationship between student performance and expenditure per student is driven by the affluent school districts.

A moderate, negative correlation was found between low-income students and graduation rates in 2017 ( $r = -0.370, p < .01$ ) and 2019 ( $r = -0.449, p < .01$ ). Another moderate, negative correlation was noted between low-income students and teacher retention in 2017 ( $r = -0.460, p < .01$ ) and 2019 ( $r = -0.403, p < .01$ ). These correlations demonstrate that as the percentage of low-income students increases in high schools, it is negatively correlated with student performance on the SAT, graduation rates, and teacher retention.

**Table 12**

*Correlations for High-SES Schools with 34% or Less Low-Income Students in AY 2016-2017*

Variable	Low income %	Instr. exp. per pupil	Total SAT meets/exceeds	Teacher average salary	Graduation rate	Master’s degree	Teacher retention
Low income %	—	-.210	-.573**	-.255	-.373**	-.309*	-.099
Instr. exp. Per		—	.541**	.821**	.204	.464**	.113
Total SAT Meets/Exc.			—	.572**	.686**	.415**	.321*
Teacher average salary				—	.351*	.717**	.264
Graduation rate					—	.338*	.184
Master’s degree						—	.352*
Teacher retention							—

*Note.* \* Indicates  $p < .05$ ; \*\* indicates  $p < .01$

**Table 13***Correlations for Schools with 34% or Less Low-Income Students in AY 2017-2018*

Variable	Low income %	Instr. exp. per pupil	Total SAT meets/exceeds	Teacher average salary	Graduation rate	Master's degree	Teacher retention
Low income %	—	-.151	-.785**	-.250	-.568**	-.220	-.199
Instr. exp. Per		—	.497**	.795**	.276	.467**	.128
Total SAT meets/exc.			—	.591**	.521**	.459**	.398*
Teacher average salary				—	.279	.756**	.325
Graduation rate					—	.186	.193
Master's degree						—	.332*
Teacher retention							—

*Note.* \* Indicates  $p < .05$ ; \*\* indicates  $p < .01$

A moderate, negative correlation between low-income students and SAT reading and math scores was noted in 2017 ( $r = -0.573, p < .01$ ), but a strong, negative correlation was noted in 2018 ( $r = -0.785, p < .01$ ) and in 2019 ( $r = -0.723, p < .01$ ). Another moderate, negative correlation was found between low-income students and graduation rates in 2017 ( $r = -0.373, p < .01$ ), but that correlation increased to a strong, negative correlation in 2018 ( $r = -0.568, p < .01$ ) and 2019 ( $r = -0.615, p < .01$ ).

**Table 14***Correlations for Schools with 34% or Less Low-Income Students in AY 2018-2019*

Variable	Low income %	Instr. exp. per pupil	Total sat meets/exceeds	Teacher average salary	Graduation rate	Master's degree	Teacher retention
Low income %	—	-.154	-.723**	-.213	-.615**	-.082	-.184
Instr. exp. Per		—	.533**	.811**	.348*	.498**	.226
Total SAT meets/exc.			—	.620**	.623**	.496**	.415**
Teacher average salary				—	.471**	.736**	.416*
Graduation rate					—	.420**	.107
Master's degree						—	.445**
Teacher retention							—

*Note.* \* Indicates  $p < .05$ ; \*\* indicates  $p < .01$

The 3-year span of data for schools with 34% or less low-income students demonstrated similar trends. No significant correlations were found between low-income students and instructional expenditures per student, average teacher salary, and teacher retention. A weak, negative correlation was noted between low-income students and teachers with a master's degree in AY 2016-2017 ( $r = -.309, p < .05$ ), but no significant correlations were noted with those two variables the following 2 years.

When splitting the school districts between high percentage of low-income students and schools with a low percentage of low-income students, there are different correlations between student performance on the SAT with instructional expenditures, teacher salary, and teachers with a master's degree. In 2019, across schools with a low percentage of low-income students, a

moderate correlation existed between instructional expenditures and SAT reading and math ( $r = 0.533, p > .01$ ). Similar trends were noted between student performance on the SAT with teacher salary ( $r = 0.620, p > .01$ ) and SAT performance and teachers with a master's degree ( $r = 0.496, p > .01$ ). The same trends were noted across the previous 2 years with the same variables. In schools with a higher percentage of low-income students, no correlations were noted in those variables during the 3-year span.

### **Summary**

The analysis of the schools with a low percentage of low-income students versus schools with a high percentage of low-income students continues to demonstrate that as the percentage of low-income students increases in high schools it is negatively correlated with student performance on the SAT, graduation rates and teacher retention. Schools with a low percentage of low-income students appear to dominate the results. Also, when examining the schools with a high proportion of low-income students the relationship between teacher salary, teachers with a master's degree and instructional expenditures per student with students meeting and exceeding SAT decreases consistently across all 3 years.

## CHAPTER 5: DISCUSSION

The purpose of this quantitative study was to determine if a relationship exists between SES, student enrollment, student attendance rate, graduation rate, instructional spending per pupil, average teacher salary, teacher education, teacher attendance, teacher retention, and achievement for all Illinois High School Districts as indicated on the Illinois School Report Card. Achievement was measured by the composite SAT score for 97 high school districts for three years from 2017 through 2019. A list of the districts included in this study can be found in Appendix A.

As stated in previously cited literature, teachers are the most critical aspect of the educational process (Goldhaber, 2002; Rivkin et al. 2005). Teacher characteristics such as ability and experience correlates more consistently than other characteristics to student performance on achievement tests. A highly effective teacher can have a stronger influence on student achievement than student factors such as poverty levels and minority status (Darling-Hammond, 2000; Sanders & Rivers, 1996).

In addition to the correlation between effective teachers and student achievement, research indicates that money has a positive impact on student achievement. There is relationship between teacher salaries and student achievement (Verstegen & King, 1998).

Teacher salary is one factor in attracting and retaining quality teacher candidates. Although salaries and benefits make up the largest percentage of school budgets, these factors are not the only financial means to improve student achievement. Verstegen and King (1998) suggested that further research is needed to identify the most efficient means to allocate educational funding.

For this study, data from the Illinois School Report Card for all Illinois high school districts was used to determine whether a relationship exists between specific teacher and students factors with student achievement and high school graduation rates. The remainder of this chapter discusses the findings from each research question, examines the findings from each research question further when the data sets are broken out into districts with high percentage of low-income students and low percentage of low-income students, the implications of the findings, recommendations for current practice and future research, and a conclusion of this study.

### **Discussion of Findings**

The data in this study involved the independent variables of instructional expenditure per-pupil, student economic status, teacher education, salary, and teacher attendance. The dependent variables involved high school graduation rates and the SAT composite score for each high school district in Illinois from 2017 through 2019. Illinois students in the eleventh grade are required to participate in the SAT as part of the state assessment.

The descriptive statistics indicate large discrepancies across high school districts throughout Illinois. The discrepancies are relatively consistent across the three school years (2017, 2018, and 2019) that were used in this study. Although the SAT overall mean score increased from 36.5 in 2017 to 39 in 2019, more concerning statistics were found when examining trends in the lowest performing schools. The performance range for academic achievement increased all three years with a minimum score of 9.4 and maximum score of 84 in 2019.

Discrepancies were noted in the student factors that were examined. Throughout the high school districts, large discrepancies were noted all three years with the percentage of low-income

students. In 2019, low-income students ranged from 86.7% to 1.2%. Another disparity was noted in per-pupil instructional expenditures, which demonstrates the direct cost of educating students. The range between the instructional expenditures increased all three years. In 2019, the average per pupil expenditure ranges from \$5,203 to \$16,345 for a difference of \$11,142.

Further disparities were noted in the teacher characteristics. Salaries ranges increased all three years by a total of \$3,000. In 2019, average salaries at high schools ranged from \$44,261 to \$118,305. Differences were noted in the number of teachers with master's degrees at each high school. In 2018, one district had 100% of the teaching staff with master's degrees while the lowest high school had only 15.5% of the teachers with master's degrees.

The descriptive statistics demonstrate the clear differences between high schools throughout Illinois. Districts spend drastically different amounts of money on student expenditures and teacher salaries. The statistics also show a difference between the percentages of teachers with higher educational degrees. Student academic performance also differs dramatically across high schools. These statistics tell a story of "have" and "have not" districts throughout the State, which seem to indicate that not every student is receiving a fair and quality education.

### **Research Questions Interpretation**

The four research questions for this study were broken out into two student-related variable questions and two teacher-related variable questions. A Pearson-product moment-correlation was calculated to determine the degree and directional relationships between the independent and dependent variables. Due to the large discrepancy between districts with low-income students, this researcher further analyzed the independent and dependent variables in

schools with a high percentage of low-income students versus schools with a low percentage of low-income students.

The first student-related research question involved investigating relationships between student factors and academic achievement across a three-year span. A strong, negative correlation was noted between low-income students and students who met or exceeded expectations on the SAT reading and math tests across all three years with the strongest negative correlation occurring in 2019 ( $r = -0.831, p < 0.1$ ). This analysis supports the literature that students from low-income families consistently score much lower on standardized math and reading tests than students in high-income families (Reardon & Robinson, 2008; Verstegen & Driscoll, 2008, 2009).

Regarding instructional expenditures per student and students who met or exceeded expectations on the SAT reading and math tests, a moderate, positive correlation was noted across all three years (2017  $r = 0.540, p < 0.1$ ; 2018  $r = 0.507, p < 0.1$ ; 2019  $r = 0.493, p < 0.1$ ). The analysis supports prior research that money matters in academic achievement. Greenwald et al. (1996) meta-analysis study determined that even moderate increases in student instructional expenditures might lead to increases in student achievement.

The second student related research question involved investigating relationships between student factors and high school graduation rates across the same three-year span. A moderate, negative correlation was noted between low-income students and graduation during the first 2 years (2017  $r = -0.570, p < 0.1$ ; 2018  $r = -0.585, p < 0.1$ ). In 2019, the correlation increased to a strong, negative relationship ( $r = -0.711, p < 0.1$ ).

The increase from a moderate, negative correlation from the first two years of the study to a strong, negative relationship in 2019 is significant to note. Parr and Bonitz (2015) found that

socioeconomic status, academic performance, parental involvement, and absenteeism are the most predictive factors of high school dropout. A high socioeconomic status is associated with a lower likelihood of dropping out of high school, while poor academic performance and limited parent involvement are precursors to dropping out of high school. Further research is needed to determine if one of these variables had a greater impact on the students in the 2019 data set to impact the increase negative correlation.

Lee and Polachek (2018) argued that an increase in per-pupil spending leads to an increase in high school graduation rates, but this study found a weak, positive correlation between instructional expenditures and graduation rates (2017  $r = 0.318$ ,  $p < 0.1$ ; 2018  $r = 0.295$ ,  $p < 0.1$ ; 2019  $r = 0.301$ ,  $p < 0.1$ ). Further research is needed to determine if instructional expenditures in Illinois were significantly increased if it would positively influence graduation rates.

The third research question involved investigating relationships between teacher factors such as salary, education, and retention on academic achievement. A moderate, positive correlation (2017  $r = 0.505$ ,  $p < 0.1$ ; 2018  $r = 0.540$ ,  $p < 0.1$ ; 2019  $r = 0.509$ ,  $p < 0.1$ ) was noted across all three years between average teacher salary and students meeting and exceeding expectations on the SAT test. The analysis supports previous research that asserted a significant statistical relationship between teacher salaries and student achievement (Verstegen & King, 1998).

Additionally, a moderate, positive correlation (2017  $r = 0.417$ ,  $p < 0.1$ ; 2018  $r = 0.444$ ,  $p < 0.1$ ; 2019  $r = 0.460$ ,  $p < 0.1$ ) was noted across all three years between teacher education and student achievement. Students achieve at higher levels when their teachers are certified in their

designated teaching field, have a master's degree, or are enrolled in graduate studies (Knoblock, 1986; Sanders et al., 1994).

The relationship between teacher retention and student achievement shows a moderate, positive correlation (2017  $r = 0.395$ ,  $p < 0.1$ ; 2018  $r = 0.453$ ,  $p < 0.1$ ; 2019  $r = 0.254$ ,  $p < 0.1$ ) was noted the first two years, but declined to a weak, positive correlation in 2019. This finding supports research that schools with higher achieving students typically have significant less teacher turnover (Hanushek et al., 2002).

The fourth research question involved investigating teacher factors and graduation rates. Approximately 10% of high school students drop out of high school before graduation. High school dropouts are four times more likely to be unemployed and become dependent on welfare and other government social service programs (Christle et al., 2007). Weak, positive correlations were found between teacher retention (2017  $r = 0.318$ ,  $p < 0.1$ ; 2018  $r = 0.305$ ,  $p < 0.1$ ; 2019  $r = 0.370$ ,  $p < 0.1$ ) and graduation rates during the 3-year study. Similarly, weak, positive correlations were found between teacher education (2017  $r = 0.312$ ,  $p < 0.1$ ; 2018  $r = 0.232$ ,  $p < 0.1$ ; 2019  $r = 0.291$ ,  $p < 0.1$ ) and graduation rates.

As previously noted, the research on high school graduation identifies a number of social and academic risk factors that are linked to dropping out of high school. Academic factors that teachers may have an impact on are academic performance such as grade point average or low course completion (Parr & Bonitz, 2015). Further research is necessary to determine if teacher retention rates and teacher education correlate with academic performance such as grade point average. This will provide researchers, policy-makers and educators more information to determine how best to increase high school graduation rates.

The initial analysis of the data across the three school years in this study did not provide anything new or interesting to the research. The analysis in this study demonstrated a wide range between low-income schools; thus, further analysis was completed to examine how the relationships between variables may change when split between schools with high and low SES groups.

### **Low Income Analysis**

A critical issue in the American education system is the inadequate condition of schools in economically disadvantaged areas (McGee, 2004). Most schools in economically disadvantaged areas suffer from unprepared teachers who are dealing with poor working conditions, low salaries, and high turnover rates. Students who attend these inadequate schools typically score very poorly on standardized tests (Darling-Hammond & Sykes, 2003).

Children from low-income families now comprise the majority of public-school students nationally. Currently, 51% of public-school students live in families below the federal poverty level. This percentage has increased from 32% in 1989 to 42% in 2006 to over 50% in 2013. As the number of low-income students increases, so does the achievement gap between those students and students from wealthier families (Suits, 2015).

The research on the academic achievement of low-income students and the increase of low-income students in the school systems supported the need for this researcher to further analyze the data by splitting the data sets into two groups. The relationship between spending and student achievement is critical information for policymakers in the ongoing debate between educators, parents, and taxpayers. Correlations were analyzed for both sets of data across the same 3 school years. A list of districts with 34% or more low-income students for all three school years included in this study can be found in Appendices B, C and D.

In the schools with 34% or more low-income students, weak, positive correlations were noted between low-income students and instructional expenditures per pupil across all 3 years. In schools with 34% or less low-income students, weak, negative correlations were found between low-income students and instructional expenditures per pupil across all three years. Schools are not spending significantly more per pupil for low-income students. Verstegen and King (1998) determined that money mattered the most for students in poverty. Districts must allocate more resources to students from low-income households to make an impact on academic achievement.

Additionally, weak, positive correlations were observed in schools with 34% or more low-income students with teacher salaries and low-income students across two of the three school years. In schools with 34% or less low-income students, weak, negative correlations were found across all 3 years.

In relation to the instructional spending per pupil correlation, teacher salaries and benefits comprise the majority of educational budgets. Districts comprised of students from less wealthy families typically allocate fewer resources to support teachers' salaries (Maiden & Evans, 2009). The correlations for instructional expenditures and teacher salary in this study indicate that Illinois schools are not significantly allocating more funds to low-income students. This is contradictory to the research that money matters most for students in poverty.

The correlations between low-income students and teacher retention is interesting when the schools are split by percentage of low-income students. In schools with 34% or more low-income students a moderate, negative correlation is noted across all 3 years. In comparison, schools with 34% or less low-income students a weak, negative correlation is found across all 3 years. This indicates that it is more likely for a district with a higher percentage of low-income students to experience a higher rate of teacher turnover. This finding supports the research that

teacher retention is strongly related to student characteristics such as poverty levels (Hanushek et al., 2002; Loeb & Darling-Hammond, 2005).

In schools with 34% or more low-income students a moderate, negative correlation is noted between low-income students and graduation rate in two of the three years of the study. A weak, negative correlation was found during the 2017-2018 school year. The same correlations were reviewed in schools with 34% or less low-income students. A moderate, negative correlation between low-income students and graduation rates is noted during the 2016-2017 school year, but it increases to a strong, negative correlation the following 2 years of the study.

These results are consistent with the research that students from families in poverty are less likely to graduate from high school (Croninger & Lee, 2001; Finn, 2006). Nonetheless, further investigation is required to determine why the correlation increased the final 2 years of this study. If it is possible to identify a major change across the state, then further correlation studies could identify how to improve graduation rates.

The final correlation was between low-income students and SAT reading and math scores. In schools with 34% or more low-income students, a strong, negative correlation was found between the variables across all 3 years. In comparison, in schools with 34% or less low-income students, a strong, negative correlation was also found across all 3 years. These findings support the research that economically disadvantaged students typically do not perform well on standardized testing (Darling-Hammond & Sykes, 2003).

It is important to note that these correlation studies do not consider other school resources or student characteristics such as language background or poverty level that may impact student achievement. The study was unable to consider numerous changes that occurred in the background during the analysis of data of Illinois high schools from 2017-2019. For example,

student enrollment changes, funding changes or changes in school leadership could all possibly have an impact on the relationships between the variables of this study.

### **Implications**

It is time to make drastic changes to close the achievement gap. Teachers are a key resource in improving academic achievement and lowering the achievement gap. Placing effective teachers in every classroom, especially those classrooms with higher percentages of students from low-income families, is critically important. If a student has several effective teachers in succession, that student would overcome the achievement gap between low-income students and students from wealthier families. The research also indicates that the reverse is true for students placed with ineffective teachers. These students demonstrate diminished learning over the course of consecutive school years (Maiden & Evans, 2009).

Through the years, research has shown and courts have ruled that many state educational funding systems create limited educational opportunities and inequities across the country. These antiquated school funding systems deprive millions of schoolchildren, especially minority children and children from low-income families, the resources necessary to be successful in school. Documented court cases find that children of color and from poverty families tend to go to schools that have overcrowded classrooms, with high teacher turnover, and curricula that is too weak to prepare them for success in college. Many states are not providing an equitable education for all students (Sciarra & Hunter, 2015).

Illinois school districts must level the playing field and ensure that highly qualified, effective teachers are available in every classrooms, especially the schools with a high percentage of families in poverty. It is important that resources be allocated to these schools to ensure that teacher salary schedules and instructional expenditures are equivalent in all districts.

An incentive structure should also be created to entice teachers to work in schools with a high percentage of low-income students. Darling-Hammond (2000) found that highly qualified teachers often elect to work in schools where socially disadvantaged students do not make up the majority of the student enrollment. Districts must create a structure to change that practice.

Numerous studies, including this study, have shown that a large factor for the achievement gap can be accounted for by the percentage of low-income students (Darling-Hammond, 2007; Reardon & Robinson, 2008). Despite numerous efforts to close the achievement gap, it continues to widen (Huang, 2015). Districts with a high percentage of low-income students typically have a higher percentage of high school dropouts. The Bureau of Labor Statistics found that in 2014 the weekly median annual earnings for a high school dropout was \$488; and more than \$200 higher for a high school graduate. A high school diploma matters and is a minimal requirement for most employers.

Students living in poverty cost the nation approximately \$500 billion per year (Acemoglu, 2013). A long-held belief of many economists is that a quality education is a critical investment in the financial well-being of the individual, but also an investment in the entire nation (Alexander, 2008). Federal and state governments must invest the necessary resources to provide all students and equitable education that will ensure success throughout their educational career and beyond.

## **Recommendations**

The results from this study support the literature regarding the correlations between the main variables studied in the research questions. In schools with a higher percentage of low-income students, low-income percentages negatively correlate with student performance on the

SAT, graduation rates, and teacher retention. This study concludes that the research is consistent in Illinois high schools as well.

Illinois currently ranks 50th in percentage of educational funding that comes from the state. Illinois only contributes about 20% of school funding, while the national average is 45%. This funding formula places the burden on the local taxing body, which leads to inequities between poor and wealthy communities (State Education Funding in Illinois, 2016). The first recommendation is for Illinois to increase the amount of educational funding to be closer to the national average. This would lessen the burden on local taxing bodies and limit the inequities in funding.

On August 31, 2017, Governor Rauner signed into law the Evidence-Based Funding for Student Success Act. This law comprehensively changes the way the state provides educational funding for schools. Evidence-based funding sends more money to Illinois' neediest students (ISBE, 2018). Based on this monumental change to the funding formula, the second recommendation is for Illinois to fully implement the new funding formula consistently for the next five years. Further research is needed to determine if this new formula provides the necessary resources to districts with higher percentages of students from poverty, other at-risk categories, and any ensuing impact on student achievement and graduation rates.

Research provides clear direction that money has a positive impact on student achievement (Jefferson, 2005). Based on the previous recommendation, a case should be made to invest more money now to save money in the long term. Researchers and educators have long recognized the importance of identifying predictive factors for high school dropouts. It is estimated that the lost lifetime revenue for male high school dropouts is approximately \$944 billion dollars. In addition, the costs related to poor health and criminal activity are estimated to

be \$24 billion (Martin & Halpern, 2006). Given the economic impact on the American economy as well as the society as a whole, the country may be better served to invest more heavily on education up front for greater overall benefits down the line.

A critical factor when investing more money in education is determining how best to spend the additional funds. Policy-makers and educators must be good stewards of taxpayer money. It is not good enough to invest additional funds to close the achievement gap; we must do so effectively and wisely. We also must create wage competitiveness across Illinois so that districts in high poverty areas are able to attract and retain high quality teachers. To ensure an equitable school system, each district must limit staff turnover and attract highly qualified and effective teachers. Increasing teacher salaries to be market competitive is one way to accomplish this goal (Baker et.al, 2018; Murnane & Olsen, 1990).

Policy-makers, educators, parents and taxpayers have debated the issue of closing the achievement gap and school funding for decades. Unfortunately, a very important stakeholder has had very limited input in these important conversations. Students need the opportunity to share their unique perspectives on their schools and the causes and possible solutions to improve academic achievement (Mitra, 2006).

Lastly, policy-makers must provide a venue for educators and parents from low-income backgrounds to share their challenges so schools can better support students throughout their academic career. Policy-makers and educators can use this information to create support structures and better allocate funding in areas that will support at-risk students.

### **Recommendations for Further Study**

This study focused strictly on high school districts within the state of Illinois. While the results of this study support current research on many of the teacher and student variables,

further research is required to see if similar correlations exist throughout the country. This would provide researchers the opportunity to examine how different educational funding systems may impact the relationships across multiple variables.

Further studies may also consider expanding the current research framework to determine if relationships exist between other student factors such as race, gender, English language learners, and the correlation with academic achievement and graduation rates. Significant achievement gaps exist not only with economically disadvantaged students, but also with minority students (Darling-Hammond, 2007). Determining relationships with these additional student factors would assist educators and policy-makers improve the educational model for all students.

Another recommendation for further study would be to further disaggregate the data from this study by including elementary and unit school districts. This study only analyzed data at the high school level. It is critical to understand the relationships between student and teacher variables at these other levels of schooling throughout the state.

This study examined how various student and teacher factors affect student achievement and graduation rates. Another important area to for further study is to research school factors such as student enrollment, class size, and curriculum programs regarding their impact on achievement and graduation rates. These factors vary tremendously across the state, so it would be beneficial to policy-makers and educators to better understand how to utilize educational funds to improve these factors for students.

Lastly, further research could involve expand the years of data in this study to include three consistent years under the new Evidence-Based Funding for Student Success Act. This new funding formula provides additional education funds based on student needs. It is critical to

determine if money is being allocated on the correct resources to make a difference with student achievement. This research would inform legislators regarding additional policies or funding structures needed, especially in light of the inevitable funding cuts that are looming throughout the state.

## **Conclusion**

“Advanced nations today recognize the value of education not only as an important civilizing agent, but also as the means by which a country can maintain both political and economic stability” (Alexander, 2008, p. 149). If the United States truly values education and understands the importance education has in creating a better society, we must create a level playing field for our students. All students must have access to highly qualified and effective teachers. We must determine the necessary resources each student requires to be successful based on race, socioeconomic status, and family background. Then we must fully fund schools to provide these resources.

The purpose of this study was to investigate the relationship between socioeconomic status (SES), student enrollment, student attendance rate, graduation rate, instructional spending per pupil, average teacher salary, teacher education, teacher attendance, teacher retention, and achievement for all Illinois High School Districts as indicated on the Illinois School Report Card. Similar to previously cited research, a significant relationship was found between low-income students and SAT reading and math scores across all three years. These findings support the research that economically disadvantaged students typically do not perform well on standardized testing (Darling-Hammond & Sykes, 2003). This study also confirmed prior research in identifying relationships between low-income students, teacher retention and graduation rates (Croninger & Lee, 2001; Finn, 2006; Hanushek et al., 2002; Loeb & Darling-Hammond, 2005).

Unique to this study was the addition of the split data sets by designating schools with 34% or more students as low-income and then analyzing three years of data. The large discrepancy in the percentage of low-income students across high school districts in Illinois prompted this researcher to split districts during the statistical analysis. By creating these separate data sets, the researcher was able to examine the impact of low-income students on the various teacher and student factors. The findings highlight the negative correlation between low-income students with academic achievement, graduation rates and teacher retention.

Schools are being held to an increasing accountability across the nation. In order to meet the performance levels and provide all students with an education to meet their specific needs, it is critical that research pinpoints the necessary educational resources to meet students' needs. Providing the necessary funding and allocating it effectively across districts is critical to student success.

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## APPENDIX A: Illinois High School Districts Identified in Study

District	County	District	County
Adlai E Stevenson HSD 125	Lake	Lockport Twp HSD 205	Will
Amandla Charter School	Cook	Lyons Twp HSD 204	Cook
Anna Jonesboro CHSD 81	Union	Maine Township HSD 207	Cook
Argo CHSD 217	Cook	Marengo CHSD 154	McHenry
Armstrong Twp HSD 225	Vermilion	McHenry CHSD 156	McHenry
Belleville Twp HSD 201	Saint Clair	Mendota Twp HSD 280	La Salle
Benton Cons HSD 103	Franklin	Minooka CHSD 111	Grundy
Bloom Twp HSD 206	Cook	Morris CHSD 101	Grundy
Bradley Bourbonnais CHSD 307	Kankakee	Mt Vernon Twp HSD 201	Jefferson
Bremen CHSD 228	Cook	Mundelein Cons HSD 120	Lake
Carbondale CHSD 165	Jackson	Nashville CHSD 99	Washington
Central CHSD 71	Clinton	New Trier Twp HSD 203	Cook
Centralia HSD 200	Marion	Newark CHSD 18	Kendall
CHSD 117	Lake	Niles Twp HSD 219	Cook
CHSD 128	Lake	Northfield Twp HSD 225	Cook
CHSD 155	McHenry	O Fallon Twp HSD 203	Saint Clair
CHSD 218	Cook	Oak Lawn CHSD 229	Cook
CHSD 94	Dupage	Oak Park - River Forest SD 200	Cook
CHSD 99	Dupage	Ottawa Twp HSD 140	La Salle
Cons HSD 230	Cook	Pekin CSD 303	Tazewell
County of Woodford School	Woodford	Pinckneyville CHSD 101	Perry
DuPage HSD 88	Dupage	Pontiac Twp HSD 90	Livingston
Dwight Twp HSD 230	Livingston	Princeton HSD 500	Bureau
East Alton-Wood River CHSD 14	Madison	Proviso Twp HSD 209	Cook
East Peoria CHSD 309	Tazewell	Rantoul Township HSD 193	Champaign
Evanston Twp HSD 202	Cook	Reavis Twp HSD 220	Cook
Evergreen Park CHSD 231	Cook	Rich Twp HSD 227	Cook
Fairfield Comm H S Dist 225	Wayne	Richmond-Burton CHSD 157	McHenry
Fenton CHSD 100	Dupage	Ridgewood CHSD 234	Cook
Freeburg CHSD 77	Saint Clair	Riverside-Brookfield Twp SD 208	Cook
Gardner S Wilmington Twp HSD 73	Grundy	Rochelle Twp HSD 212	Ogle
Glenbard Twp HSD 87	Dupage	Rock Falls Twp HSD 301	Whiteside
Grant CHSD 124	Lake	Salem CHSD 600	Marion
Grayslake CHSD 127	Lake	Seneca Twp HSD 160	La Salle
Hall HSD 502	Bureau	St Anne CHSD 302	Kankakee
Hinsdale Twp HSD 86	Dupage	St Joseph Ogden CHSD 305	Champaign
Homewood Flossmoor CHSD 233	Cook	Streator Twp HSD 40	La Salle
Hononegah CHD 207	Winnebago	Thornton Fractional Twp HSD 215	Cook
Illini West H S Dist 307	Hancock	Thornton Twp HSD 205	Cook
J S Morton HSD 201	Cook	Township HSD 211	Cook
Joliet Twp HSD 204	Will	Township HSD 214	Cook
La Salle-Peru Twp HSD 120	La Salle	Twp HSD 113	Lake
Lake Forest CHSD 115	Lake	United Twp HSD 30	Rock Island
Lake Park CHSD 108	Dupage	Vienna HSD 133	Johnson
Lemont Twp HSD 210	Cook	Warren Twp HSD 121	Lake
Leyden CHSD 212	Cook	Washington CHSD 308	Tazewell
Limestone CHSD 310	Peoria	Zion-Benton Twp HSD 126	Lake
Lincoln CHSD 404	Logan		
Lincoln Way CHSD 210	Will		

**APPENDIX B: Illinois High School District Identified in Study Based Upon 34% or More  
Students Identified as Low-Income 2016-2017**

<b>District</b>	<b>Student Enrollment</b>	<b>Low Income %</b>	<b>4-Year Grad Rate Total</b>	<b>Total SAT Meet and Exceed %</b>
CHSD 218	5262	99.5	87.1	22.9
J S Morton HSD 201	8190	88.5	78.2	9.8
Bloom Twp HSD 206	3067	80.8	75.7	14.55
Rich Twp HSD 227	3057	80.2	85.4	15.2
St Anne CHSD 302	241	77.6	80	19.3
Thornton Fractional Twp HSD 215	3268	74.1	93.5	14.1
Joliet Twp HSD 204	6462	62.8	80.5	27.3
Rantoul Township HSD 193	790	62.7	88.5	16.75
Centralia HSD 200	912	61.7	78.1	24.75
East Alton-Wood River CHSD 14	554	61.7	78.5	15.75
Carbondale CHSD 165	1027	59.6	84.7	38.75
Zion-Benton Twp HSD 126	2620	59.3	81.4	23.3
United Twp HSD 30	1688	59.2	91.3	18.8
Mt Vernon Twp HSD 201	1197	55.9	82.3	23.6
Southland College Prep Chtr HS	522	55.7	99.1	32.75
Streator Twp HSD 40	943	55.4	82.7	21.35
Leyden CHSD 212	3321	55.1	87.7	26.55
Fenton CHSD 100	1499	54.2	92.4	29.95
Benton Cons HSD 103	565	51.2	81.9	22.85
Rock Falls Twp HSD 301	666	50.6	88.8	25.9
East Peoria CHSD 309	1020	49.9	94.5	26.1
Reavis Twp HSD 220	1800	49.5	89.5	27.1
DuPage HSD 88	3973	48.9	88.3	36.1
Salem CHSD 600	705	48.4	89.5	33.4
Mendota Twp HSD 280	553	48.3	93.8	32.65
Hall HSD 502	417	47.7	80.7	25.35
CHSD 94	2051	47.6	97.1	35.95
Vienna HSD 133	357	45.9	90.7	41.35
Pekin CSD 303	1935	44.7	80.1	34.85
Limestone CHSD 310	1067	44	82.5	23.7
Anna Jonesboro CHSD 81	520	43.7	89.4	31.95
Lincoln CHSD 404	844	43.6	79.2	35

Belleville Twp HSD 201	4860	43.4	91.5	31.2
Fairfield Comm H S Dist 225	428	42.8	87.9	17.15
Bradley Bourbonnais CHSD 307	2072	42.2	94.9	29.2
Argo CHSD 217	1856	42	86.1	27.05
Proviso Twp HSD 209	4428	41.7	74.9	23.35
Paris Cooperative High School	616	41.7	83	25.15
Evanston Twp HSD 202	3329	40.8	92.3	56.8
Bremen CHSD 228	5106	39.8	87.5	24.2
La Salle-Peru Twp HSD 120	1220	39.4	89	35.5
Pontiac Twp HSD 90	677	39	92.2	33.1
Oak Lawn CHSD 229	1744	38.6	91.3	26.8
Armstrong Twp HSD 225	139	37.4	86.7	24.2
Township HSD 211	11874	35.4	93.6	53.15
Pinckneyville CHSD 101	450	34.7	89.7	37.1
Illini West H S Dist 307	349	34.7	94.3	28.9
Dwight Twp HSD 230	260	34.6	87.1	47.05
Grant CHSD 124	1874	34.5	90.3	38.6
Glenbard Twp HSD 87	7989	34.2	92.6	47.75

**APPENDIX C: Illinois High School District Identified in Study Based Upon 34% or More  
Students Identified as Low-Income 2017-2018**

<b>District</b>	<b>Student Enrollment</b>	<b>Low Income %</b>	<b>4-Year Grad Rate Total</b>	<b>Total SAT Meet and Exceed %</b>
Thornton Fractional Twp HSD 215	3438	97	95.7	14.3
J S Morton HSD 201	8287	87.8	76.6	11.2
Amandla Charter School	245	87.8	74.5	4.0
Bloom Twp HSD 206	3075	82.5	79.7	14.4
Rich Twp HSD 227	3001	81.3	81.7	10.9
St Anne CHSD 302	217	80.6	86.9	16.7
CHSD 218	5405	69	86.1	22.25
Rantoul Township HSD 193	753	67.1	86.6	14.6
Argo CHSD 217	1944	65.1	88.9	26.7
United Twp HSD 30	1700	62.4	94.3	18.35
East Alton-Wood River CHSD 14	572	61.5	81.6	16.4
Zion-Benton Twp HSD 126	2633	60.5	81.5	20.75
Joliet Twp HSD 204	6719	60.2	77.4	22
Carbondale CHSD 165	1009	58.4	87.8	40.2
Centralia HSD 200	908	58.3	78.5	22.4
Thornton Twp HSD 205	5140	58	67.1	7
Leyden CHSD 212	3457	55.9	87	26.1
Mt Vernon Twp HSD 201	1169	54.1	85.2	18.2
Benton Cons HSD 103	548	53.8	88.2	22
Reavis Twp HSD 220	1823	51.3	85.6	26.1
East Peoria CHSD 309	988	51	95	23.9
Fenton CHSD 100	1493	51	92.8	30.15
Streator Twp HSD 40	882	50.3	77.3	19.2
Rock Falls Twp HSD 301	649	49.9	85.2	24.85
DuPage HSD 88	3947	49.9	86.5	32.7
Mendota Twp HSD 280	561	49.6	88.5	27.4
Salem CHSD 600	694	48.8	84.2	22.85
Hall HSD 502	438	46.1	79.8	28.95
Vienna HSD 133	380	45.8	97.8	23.85
Belleville Twp HSD 201	4735	45.1	90.7	29.55
Lincoln CHSD 404	826	44.8	78	29.7
Anna Jonesboro CHSD 81	521	44.5	91.2	21.2
Limestone CHSD 310	1093	43	81.9	25.4
Pekin CSD 303	1849	42.9	81.4	30.35

Bradley Bourbonnais CHSD 307	2047	42.6	93.3	28.7
Armstrong Twp HSD 225	134	42.5	87.1	16.65
La Salle-Peru Twp HSD 120	1231	41.8	85	30.35
Pontiac Twp HSD 90	651	41.5	95.7	29.9
Illini West H S Dist 307	341	39.9	78.1	21.8
Evanston Twp HSD 202	3547	38.5	91.1	53.5
Pinckneyville CHSD 101	451	38.1	90.3	33
Princeton HSD 500	531	36.7	89.6	32.2
Oak Lawn CHSD 229	1838	36.3	90.7	23.85
Township HSD 211	11841	35.5	93.5	51.7
Dwight Twp HSD 230	253	35.2	93.4	36.95
Grant CHSD 124	1845	34.5	88.5	35.25
Bremen CHSD 228	5089	34.3	86.1	21.15
Fairfield Comm H S Dist 225	431	34.1	75.7	23.05

**APPENDIX D: Illinois High School District Identified in Study Based Upon 34% or More  
Students Identified as Low-Income 2018-2019**

<b>District</b>	<b>Student Enrollment</b>	<b>Low Income %</b>	<b>4-Year Grad Rate Total</b>	<b>Total SAT Meet and Exceed %</b>
J S Morton HSD 201	8417	86.7	80	11.5
Thornton Twp HSD 205	4970	86.2	72.2	8.25
Amandla Charter School	272	85.7	77.7	3
Bloom Twp HSD 206	2995	82.9	83.4	15.3
St Anne CHSD 302	206	82	81.4	19.3
Rich Twp HSD 227	2938	78.5	86.3	10.35
CHSD 218	5436	70.8	84.3	19.65
Rantoul Township HSD 193	783	70.5	87.3	12.9
Thornton Fractional Twp HSD 215	3415	67.7	83.9	13.8
Argo CHSD 217	1987	63.6	86.7	26.1
East Alton-Wood River CHSD 14	606	62.2	85.1	16.4
Carbondale CHSD 165	1004	60.9	90.6	35.9
Centralia HSD 200	897	60.1	72.8	23.35
Joliet Twp HSD 204	6769	60.1	77.1	23.15
United Twp HSD 30	1710	60	92.7	18.3
Benton Cons HSD 103	585	56.8	85.6	21.5
Mt Vernon Twp HSD 201	1189	56.6	82.4	21.95
Zion-Benton Twp HSD 126	2621	55.9	79.6	19.45
Leyden CHSD 212	3522	55.9	84.2	25.95
Fenton CHSD 100	1473	52.5	94	29
Rock Falls Twp HSD 301	667	50.7	96.1	22.35
DuPage HSD 88	3986	49.6	87.8	30.75
Vienna HSD 133	386	49.2	87	26.25
East Peoria CHSD 309	988	49.1	89.8	22.8
Hall HSD 502	462	48.9	84	29.6
Fairfield Comm H S Dist 225	447	48.3	89.1	19.55
Salem CHSD 600	665	48.3	83	30.45
Streator Twp HSD 40	856	48.2	81	21.4
Mendota Twp HSD 280	563	48.1	87.1	32.4
Belleville Twp HSD 201	4735	45.7	91	30.2
Pekin CSD 303	1848	45.3	84.7	28.85
Lincoln CHSD 404	816	42.8	83.6	33.7
Bradley Bourbonnais CHSD 307	2016	42.4	91.9	24.8
La Salle-Peru Twp HSD 120	1279	41.8	86	31.3
Anna Jonesboro CHSD 81	533	41.3	88.8	28.35

Limestone CHSD 310	1028	40.7	80.5	30.25
Oak Lawn CHSD 229	1910	40.2	90.5	25.45
Reavis Twp HSD 220	1851	39.7	89.2	22.95
Pontiac Twp HSD 90	694	38.8	90.4	26.05
Armstrong Twp HSD 225	134	38.8	87	21
Bremen CHSD 228	5084	37.7	86.8	20.7
Evanston Twp HSD 202	3610	36.9	92	51.6
Ottawa Twp HSD 140	1343	36.3	85.3	29.35
Township HSD 211	11857	36.2	94.2	50.05
CHSD 94	2077	36	90.4	27.7
Pinckneyville CHSD 101	462	35.5	92.3	29.3
Princeton HSD 500	564	34.6	91.2	30.1
Proviso Twp HSD 209	4592	34.3	76.1	16.05