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Realizing the Ideal School District Size: How District Size Affects Achievement and Expenditure

James L. Hayes III
Illinois State University, jlhaye2@ilstu.edu

REALIZING THE IDEAL SCHOOL DISTRICT SIZE: HOW DISTRICT SIZE AFFECTS ACHIEVEMENT AND EXPENDITURE

JAMES L. HAYES, III

99 Pages

The purpose of this study was to determine what size district (or range of sizes) better fosters an environment conducive for high student achievement and low district expenditure. The ideal district size debate goes back centuries, with the initial efforts to reform small districts that had their start in the early 19th century as rural single room schools. Literary work on this topic is quite polarized, without a clear and modern consensus. This study contained a quantitative study using a correlational research design to explore the effects of district size on student achievement and district expenditure.

KEYWORDS: consolidation, district consolidation, district expenditure, district size, ecological system theory, Goldilocks Principle, Illinois, performance, pro's, rural school, student achievement, schools, students

REALIZING THE IDEAL SCHOOL DISTRICT SIZE: HOW DISTRICT SIZE AFFECTS ACHIEVEMENT AND EXPENDITURE

JAMES L. HAYES, III

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JAMES L. HAYES, III

COMMITTEE MEMBERS:

Guy Banicki, Chair

John Rugutt

Lynne Haeffele

William Phillips

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J. L.H.

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CHAPTER I: BACKGROUND OF THE STUDY

Introduction

One of the most influential and impactful educational reforms to take place in United States public school systems is district consolidation (Adams & Foster, 2002; Berry, 2006; Boser, 2103; Duncombe & Yinger, 2005; Duncombe & Yinger, 2010; Howley, Johnson, & Petrie, 2011). Since 1938, the number of districts has decreased from over 117,000 to approximately 14,000 by 2014; close to 90% of districts in the United States have been consolidated (National Center for Education Statistics [NCES], 2015). Despite this massive consolidation of districts, there is little evidence and much controversy surrounding which size district is better for student achievement and district expenditure (Andrews, Duncombe, & Yinger, 2002; Balcom, 2013, Berry, 2006; Berry & West, 2008; Boser, 2013; Duncombe & Yinger, 2010; Gordon & Knight, 2008). The purpose of this study was to find if an ideal district size, or range of sizes, exists in terms of proving an environment conducive for high student achievement and low district expenditure.

Context of the Problem

The debate over district size goes back centuries, with the initial efforts to reform small districts that had their start in the early 19th century as rural single room schools (Boser, 2103). From the late 1930s to present day, almost 90% of districts in the United States have experienced some form of consolidation (NCES, 2015). In 1938, nearly 50% of districts had fewer than 300 students; as of 2014, as little as 20% of districts had fewer than 300 students (NCES, 2015). Over the last century, the number of districts has decreased, even as the number of enrolled students has increased, causing the average district enrollment to increase from 187 in 1938 to 3,600 in 2014 (NCES, 2015). The consolidation reform is unparalleled in relation to any other modern-

time reform, and its influence has lead to the current educational landscape of the United States public school system (Adams & Foster, 2002; Berry, 2006; Duncombe & Yinger, 2005).

As consolidation began to have a major influence on students, communities, and even states, a significant void of empirical evidence on how district size affected student achievement and district expenditure began to grow (Balcom, 2013; Robertson, 2007; Taylor, Van Scotter & Coulson, 2007; Diaz, 2008). Being able to make definite evidence-based claims that consolidating districts into a certain enrollment size would improve student achievement and district expenditure is something that the consolidation reform has lacked for decades (Adams & Foster, 2002; Augenblick, Myers, & Silverstein, 2001; Bickel & Howley, 2000; Boser, 2013; Chingos, Whitehurst, & Gallagher, 2013; Driscoll, Halcoussis, & Svorny, 2003; Howley, 2000; Howley et al., 2011; NASBE, 2003; Schmidt & Schlottmann, 2007). However, due to pressure from policymakers to ease the academic and fiscal concerns of public education, a new wave of consolidation is at hand, and with a limited amount of statistical evidence to provide guidance, it is becoming more and more difficult for policymakers to promote or support consolidation reform (Adams & Foster, 2002; Augenblick et al., 2001; Bickel & Howley, 2000; Boser, 2013; Chingos et al., 2013; Driscoll et al., 2003; Howley, 2000; Howley et al., 2011; NASBE, 2003; Schmidt & Schlottmann, 2007). In addition to the quantity of statistical evidence being very small in comparison to size effect studies of other variables (such as school or class size), the existing limited research presents diverse findings, leading to little consensus and even less conclusive results on which district size positively affects student achievement and district expenditure (Andrews et al., 2002; Balcom, 2013; Duncombe & Yinger, 2010).

Literature on the topic of district consolidation is quite polarized. Those on one side of the issue argue that larger districts are superior due to increasing the size of operation and allowing

the economies of scale to improve the relationship of district expenditure with that of student achievement in a positive correlation (Duncombe & Yinger, 2007; Durflinger & Haeffele, 2011; Flowers, 2010). Themes found in the literature emphasize that increasing district enrollment lowers cost per pupil expense, freeing up funds that could be used to improve the quality of education as well as save taxpayer money (Bard et al., 2006; Duncombe & Yinger, 2005; Durflinger & Haeffele, 2011; Robertson, 2007). Supporters of this belief often focus on prevailing thoughts of the Industrial Revolution in which increasing production reduces cost per product, and how public education could benefit from using similar organizational techniques in order to make the education system more fiscally efficient (Bard et al., 2006; Howley et al., 2011).

Those on the other side of the issue suggest that smaller districts are superior to increasing student achievement while decreasing district expenditure by creating stronger social connection between district personnel and students. Supporters claim the social connection leads to increased attendance, additional engagement in curricular and extra-curricular activities, and an overall increase in shared responsibility of success (Driscoll et al., 2003; Duke et al., 2009; Durflinger & Haeffele, 2011; Gordon & Knight, 2008; Smithson, 2016; Yan, 2006). Researchers also focus on pointing out the faults of consolidation, often claiming that the financial and achievement benefits of consolidation are vastly overestimated (Cox, 2002; Duncombe & Yinger, 2005; Howley et al., 2011; Schmidt & Schlottmann, 2007; Smithson, 2016). Additionally, researchers make claims that simply increasing district enrollment is not a reasonable solution to increasing student achievement and decreasing district expenditure (Andrews et al., 2012; Gordon & Knight, 2008; Robertson, 2007).

Even when reviewing recent work of researchers making claims of realizing the ideal district size, it is difficult to derive a consensus. In this literature, the claimed ideal minimum size for a district is anywhere in the range of 400-2,000 students per district (Bard et al., 2006; Berry & West, 2008; Duncombe & Yinger, 2007; Howley et al., 2011; Indiana State Legislation, 2007; Inerman & Otto, 2003; Lawrence et al., 2002; Taylor et al. 2007). The ideal maximum size for a district, claimed by researchers, is anywhere from 4,000 to 6,000 students per district (Bard et al., 2006; Berry & West, 2008; Duncombe & Yinger, 2007; Howley et al., 2011; Indiana State Legislation, 2007; Inerman & Otto, 2003; Lawrence et al., 2002; Taylor et al., 2007). Aside from the inconsistency in their results, these researchers present findings that are very broad and unspecific, and include ranges of size that very few districts currently fall under, providing little guidance to future consolidations and consolidation legislation.

In addition to all of this conflicting research, as well as having little understanding of how district size affects student achievement or district expenditure, as of the time of the current study, 33% of the states in the United States have active legislation that is contradictory to the economies of scale benefits of consolidation (Boser, 2013; Duncombe & Yinger, 2010; Howley et al., 2011). In the last decade, almost 25% of state legislatures have proposed or passed some type of mandatory or incentivized district consolidation legislation (Bard et al., 2006; Boser, 2013; Gierzynski, 2007; Gordon & Knight, 2008; PSBA, 2009; Taylor et al., 2007; Weldon, 2012). With increasing claims of a failing and broken system, as well as the expansion of state involvement in local education, the accountability, financial support, and most importantly the need to increase student achievement while lowering the tax-burden will continue to keep consolidation reform a popular solution with policymakers, as well as a need for a better

understanding of its affects (Andrews et al., 2002; Augenblick et al., 2001; Balcom, 2013; Boser, 2013; Duncombe & Yinger, 2010; Howley et al., 2011).

Purpose of the Study

The purpose lied in better understanding how the size of a district affects student achievement and district expenditure in order to determine what size district (or range of sizes) better fosters an environment conducive for high student achievement and low district expenditure.

Research Questions

The researcher analyzed quantitative data to determine what, if any, effects the enrollment size of a school district has on student achievement and district expenditure in order to answer the following research questions:

1. Is there empirical data to suggest a relationship between: a) student achievement and district size? b) district expenditure and district size?
2. Are there significant mean differences in student achievement across school districts based on district size? Are there significant means differences in district expenditure across school districts based on district size?

Study Design

The current research was a quantitative study using a correlational research design to explore the affect of district size on student achievement and district expenditure. The design for this study was a multi-stepped comparison analysis of calculated ratios that formed a collect-collate-calculate-compare method in order to investigate how size affects student achievement and district expenditure (see Figure 1).

After the researcher collected the necessary district data, he collated each set according to its size category. The researcher classified districts into four size categories: Rural (under 500 students), Exurban (500-1,499 students), Suburban (1,500-2,500 students), Urban (over 2,500 students). The researcher used four categories versus replicating the three used by the Illinois State Board of Education (ISBE) in order to better serve districts that might fall within the single Medium category (ISBE, 2017). As the researcher calculated the data for each school district size category, he compared it to the ratios of the other size categories to determine what differences and similarities existed. The researcher used a linear regression analysis to indicate the amount of variation among the standardized test scores and expenditures ascertained by the relationship between the variables. Using regression analysis allowed the researcher to see how student achievement and district expenditure are affected by district size. In addition, the researcher conducted an ANOVA to determine differences among districts in their size in relation to student achievement and district expenditure.

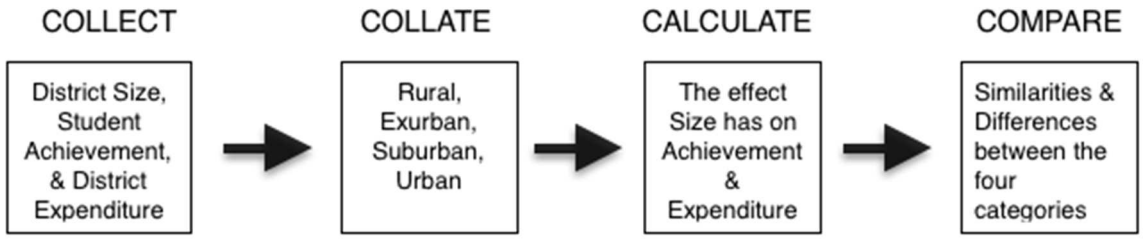

Figure 1. Collect-collate-calculate-compare model.

For the current study, the researcher utilized data provided by the Illinois State Board of Education (ISBE) on school districts in the state of Illinois to address the study's research questions. Students at multiple grades take state-mandated achievement tests statewide, which consequently provide the most consistent data for comparing student achievement uniformly across all districts. The researcher used the percentage of students passing achievement tests to

measure student achievement. The unit of analysis for this study was the districts in the state of Illinois for the 2015-16 school year that the researcher was able to secure.

The researcher determined the required number of samples or sample size for this current quantitative study by conducting a power analysis. The results of the power analysis computed for 55 samples of school districts in the state of Illinois. The researcher conducted purposive sampling to collect samples, because sampling for proportionality was not the main concern. The researcher collected data via secondary sources, and requested it from the Data and Analysis office of ISBE. The office had the data on the district expenditure, district size, and student achievement on their databases and records.

Definition of Terms

Consolidation. A type of school district reorganization that creates a new district, usually by combining two or more districts or parts of said districts.

District. A geographical unit for the local administration of public schools.

District expenditure. The gross operating expenditure per pupil (OEPP) cost of a school district (excepting summer school, adult education, bond principal retired, and capital expenditures) divided by the 9-month average daily attendance (ADA) for the regular school term (ISBE, 2015).

District size. Number of students enrolled in an entire school district according to the district's average daily attendance (ADA).

Economies of scale. The cost advantage that arises with increased output of a product.

Policymakers. The umbrella term used to refer to individuals such as public school administrators, appointed educational officials, or elected public officials who have the ability to create and/or implement public education policy, legislation, and/or mandates.

Student achievement. How students score on the Illinois state Partnership for Assessment of Readiness for College and Careers (PARCC) achievement test.

Limitations and Delimitations

The following limitations existed in this study:

1. This study used districts in the state of Illinois as the data set for several reasons: Illinois is an exemplar state of having a higher comparable percentage of districts that are entrenched in the consolidation debate (Dabrowski & Klingner, 2016). Its legislature is one of the most active when it comes to introducing and enacting consolidation policies in the recent decade (National Education Association [NEA], 2014). Illinois leads the nation in many comparisons of consolidation enhancements (ISBE, 2016; NEA, 2014).

2. The independent variable of district sizes—rural, exurban, suburban, and urban—were only based on the number of pupils, and did not take the geographical features into consideration. It can be argued that there are many other influences in the urban school regions that could explain the increased student achievement apart from expenditure.

The following delimitations existed in this study:

1. The researcher did not use the City of Chicago School District (CPS) for this study due to its affect in skewing the data. For example, the district average student enrollment was 3,690 at the time of the current study when CPS was not included; with CPS that number was 4,700. Including CPS in the data for this study would have altered the data by 22% (ISBE, 2015).

2. The current researcher only used the results from a one-year only post-hoc assessment data (2015-16), which may not be representative of the educational expenditure or students' achievement over a longer period. Doing so causes an increased chance that the data used is less reliable in terms of measuring student achievement.

3. There are many factors in education that could arguably be just as important that the current researcher did not measure nor control for. The researcher intentionally did not evaluate variables such as SES, graduation rate, or even college readiness, for this study, as these would take away from the focus of this study, which was how district size affects student achievement and district expenditure.

Significance

Understanding the effect district size has on student achievement and district expenditure could lead to finding an ideal district size, specifically how large a district should be to achieve levels of optimum efficiency. The results from this study may better prepare educational and state policymakers to make recommendations for the development of current and future school district consolidation policies. Furthermore, this study's conclusion of an optimum size for a school district might change the educational reform landscape, and ultimately enhance public education for generations to come.

Summary

This study was quantitative. The purpose lied in better understanding how the size of a district is related to student acheivement and district expediture in order to determine what size district (or range of size) better fosters a school system that is conducive for high student achievement coupled with low district expenditure.

Including this introduction, Chapter I, this study is organized into five chapters. In chapter II, the researcher provides a literary review and analysis of current consolidation and school district size research. In chapter III, the researcher describes the methodology for this study, as well as details of the research along with the procedures for which the data collection and analysis were conducted. Chapter IV follows with a presentation and examination of the data as it

relates to the research questions. Chapter V concludes the findings of this study, and the researcher discusses the implications found in the significance of district size as it pertains to student achievement and district expenditure.

CHAPTER II: REVIEW OF THE LITERATURE

As consolidation began to have major influence on students, communities, and states, a significant void of empirical evidence on how district size affects student achievement and district expenditure began to grow (Balcom, 2013). In 1938, nearly 50% of districts had fewer than 300 students; as of 2014, as little as 20% of districts had fewer than 300 students (NCES, 2015). Over the last century, the number of districts has decreased, even as the number of enrolled students has increased (NCES, 2015). Being able to make definite evidence-based claims that consolidating districts into a certain enrollment size would improve student achievement and district expenditure is something that the consolidation reform has lacked for decades (Boser, 2013).

The purpose of this quantitative study was to determine if the enrollment size of a school district has any effect on student achievement as well as district spending, in order to add to the socio-economic as well as the educational body of literature. In the current study, the researcher examined whether an ideal size for optimum student performance exists, and which size district provides a positive affect on district expenditure. Furthermore, the researcher sought to determine if there is evidence in the literature to show differences among districts in their size in relation to student achievement and district expenditure that are large enough to be relevant. The researcher also hoped to provide guidance to current and future consolidations and consolidation legislation in order to allow research-based district consolidation to enhance the educational process that will ultimatly allow for improved quality of public education.

Literature Search Strategy

The databases accessed to locate the needed literature and published research for this chapter included Google Scholar, DeepDyve, and ERIC. Search terms included: *district size,*

student achievement, district expenditure, Goldilocks Principle, district consolidation, district consolidation, rural school, consolidation, Illinois, pro's, schools, performance, ecological system theory, students, and combinations of these terms. To obtain the most current research, the researcher prioritized sources to show literature published within the last 4 years as of the time of the current study. The researcher included studies that he deemed relevant in this chapter. Of the 83 sources obtained for this chapter, 70 articles (84.3%) were published between 2012 and 2016, and 13 articles (15.7%) were published prior to 2012. Types of literature included peer-reviewed articles, legislation, published, informational newspaper articles, and previous studies. The literature provided further discussion on studies regarding district size, student achievement, and district expenditure.

Theoretical Framework

The theoretical framework applied for the current study is known as the ecological systems theory (ESP) of Bronfenbrenner (Burns, 2015). Through his theory, Bronfenbrenner argued that in order to understand human development, one must also learn and consider the entire ecological system in which human growth occurs (Bronfenbrenner, 2009). He contested that there are certain institutional patterns of culture that are closely related to the relationships between developing people and their immediate environment, such as school and family (Bronfenbrenner, 2009).

Burns (2015) stated that the ideal environment for student achievement and school environment is very complex, as one must address individuals and the numerous variables that affect them. ESP incorporates environmental variables such as home, school, community, and culture, and some have thus suggested it as an ideal framework for effective school psychology services (Burns, Warmbold-Brann, & Zaslofsky, 2015). Furthermore, Burns (2015) explained

that ESP is designed to be able to provide a process to identify contextual points of intervention that may lie beyond the individual, such as micro-systems and the interaction of these systems. Micro-systems are those in which individuals function on a regular basis, such as the school students attend, and the community they reside and interact in (Burns, 2015). In the case of the current study, the focus was then on the student and his or her achievement with regard to the school district and its size, as well as the community in which the student lives in before and after consolidation.

As the dependent variables for this study were the academic performance of students and district expenditures, and the independent variable as district size, this theory was appropriate due to the angle ESP allows environmental influences to have on individuals in relation to the numerous subsystems that a school districts imposes on said growth. Through the ESP lens, it may be argued that the independent variable of this study was infinitely influenced by several dependent factors, including socioeconomic status, family customs, and local influences. By understanding the relationship between the variables of this study as they related to other factors in the development of a student, the researcher was able to examine the complexity of a public educational system (macrosystem) through the narrowed lens of the size of said educational system

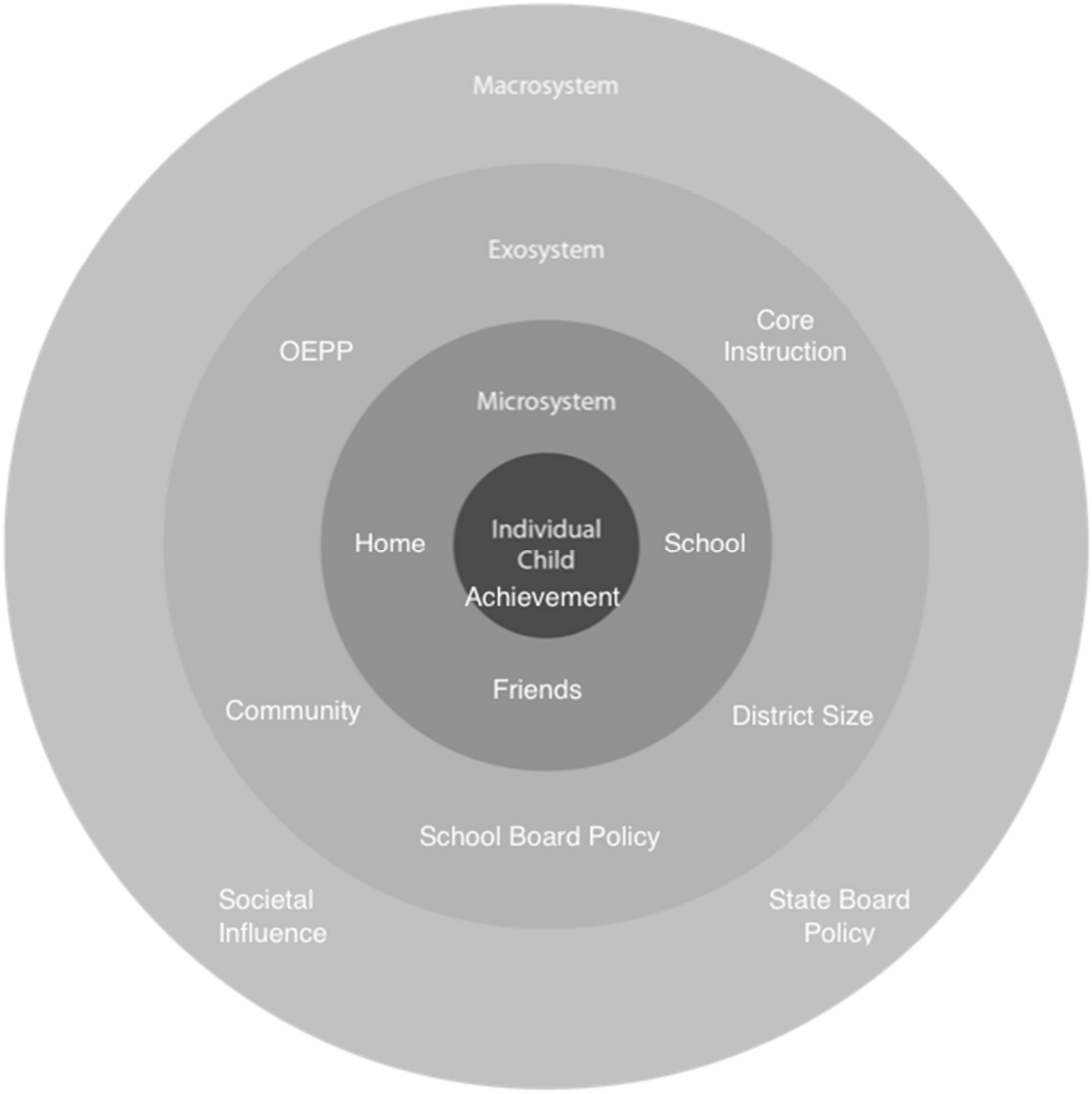

Figure 2. Bronfenbrenner's ecological systems theory.

(microsystem) without disregarding other factors that could have had possible implications to the results.

According to Wu and David (2002), ecological systems are considered to be one of the most complex systems to analyze, as a vast number of components have to be taken into account, as well as nonlinear interactions, spatial heterogeneity, and scale multiplicity. Researchers suggest that modularity in structure and functionality is often associated with complexity

(Koontz, Gupta, Mudlia, & Ranjan, 2015; Wu & David, 2002). Bronfenbrenner's theory (ESP) is one of the theories that researchers apply widely to investigate the interactions and influences on individuals within ecological environments, such as how students are affected by the size and the capital outlay of the district they attend school in (Neal & Neal, 2013). The researchers further posited that the theory was developed around the premise that ecological systems have several different levels, and that these levels interact with one another and are unable to function individually (Neal & Neal, 2013). Thus, it is important to keep this in mind during analyses, as the isolation of an ecological system within data gathering and analysis will result in inaccurate and unusable results (Neal & Neal, 2013).

An ecological perspective further assists in providing a broader and wider perspective of influences and interaction (Burns, 2015). As the researcher saw school size, school district size, and the consolidation of school districts as the primary affects on student achievement within the current study, he primarily focused the data analyses on the changes within the direct school environment, and the community in which these students interact, which may or may not affect their achievement. The underlying purpose was to determine the ideal ecological circumstances with regards to student achievement and performance within different school district sizes in order to ascertain whether and at which point school district consolidation would be the most effective. The literature review will also investigate whether consolidation is beneficial and detrimental in certain districts, and the application of the ESP assisted in determining this within the data sample.

With a plethora of variables influencing students and the context in which they learn, it is not surprising that an ecological approach to this type of study was the best option (Burns, 2015). As school size, district consolidation, and expenditures focused on students are only some of the

factors influencing student achievement, and as these factors cannot be isolated, an ecological approach was the most effective with regards to academic performance. As stated previously, the ESP was developed to take into account the interaction of micro-systems, of which these factors were a part (Burns, 2015). Furthermore, these factors are intertwined, and can be further affected by other factors such as the community and socioeconomic influences (Burns, 2015).

Other researchers have stated that it is often not taken into account that individuals, in this case students, develop and learn within contexts when assessment and intervention practices are at play, and they often fail as a result of such context rather than influences examined for this study (Reschly & Coolong-Chaffin, 2015). Students' success is instead decontextualized, and difficulties are explained as being within-child phenomena. For example, response to intervention (RTI) is a chance to discover the link between assessment and intervention when considering the contexts in which students learn and develop, providing a more in-depth analysis of potential factors influencing student achievement (Reschly & Coolong-Chaffin, 2015). A review of the literature provided further insight needed on the gap present in the research, how it related to the current study, and how the results of this study should be implemented to essentially improve student achievement in Illinois through potential district reorganization. The results of the study may be applicable to other, more intimate influences within a district, as noted earlier. In conclusion, ecological factors are complex, and thus cannot be isolated within analyses. Researchers suggest the ESP to be the most suitable theoretical framework with regards to the variables being investigated.

Review of Relevant Literature

The literature focuses on pointing out the faults of consolidation, often claiming that the financial and achievement benefits of consolidation are vastly overestimated. Furthermore, the

research will also discuss the advantages and disadvantages of consolidation that investigators have examined. There are some inconsistencies in the results of the available literature. The studies present findings that are very broad and unspecific, and include ranges of size that very few districts currently fall under, providing little guidance to future consolidations and consolidation legislation. As of the time of this study, 33% of the states in the United States had active legislation that was contradictory to the economies of scale benefits of consolidation (Boser, 2013). The researcher discusses speculation regarding an ideal district size, as well as consolidation with specific relation to Illinois.

Effects of District Size on Student Achievement and District Expenditure

The results of this literary analysis reinforced the increasing realization that understanding how district size affects student achievement and district expenditure as well as establishing the ideal district size for future consolidations and consolidation legislation is a complex and often controversial issue. One such example is the study conducted by Barton (2015) in which he determined the relationship between socioeconomic status, school size, the expenditure allocated per student, mobility rate, and the percentage of non-White students and the effect of these relationships on student achievement. Barton showed that all of the variables under investigation had an effect on the academic achievement of students, especially regarding science scores. He observed a negative effect in regards to the relationship of socioeconomic status, student mobility, and the number of non-White students with student achievement. These results may be very helpful to policymakers and school administrators, as they provide some insight on the achievement gap that exists (Barton, 2015).

Historical Ramifications and Evolution of Consolidation

District consolidation represents one of the most influential changes in the way public education is governed and managed in the United States (Amis & Aïssaoui, 2013; Gershenson & Langbein, 2015). As late as 1930, nearly 50% of American school districts had fewer than 300 students; as of 2014, as little as 20% of school districts had fewer than 300 students (NCES, 2015). Scribner (2016) stated that the days of one-room schools are long gone, as the consolidation of school districts followed its dramatic course. The 200,000 one-room schools have disappeared consistently since 1915, and by 1975 only 1,200 were left (Scribner, 2016). In turn, larger schools were founded that included age-graded classes and qualified teachers. These larger, established schools also appointed administrators and were supervised by school boards and departments of education. The schools we have today are more efficient and modern (Scribner, 2016). The debate remains whether we have reached the point at which consolidation becomes detrimental instead of beneficial.

When comparing to the structures of the public education system over the past century, policymakers have consolidated close to 90% of districts in an effort to make the business of education more efficient and effective (Amis & Aïssaoui, 2013; Duncombe & Yinger, 2010; Reingewertz, 2012; Stevenson, 2006). Over the last century, the number of districts has decreased, even as the number of enrolled students has increased, causing the average district enrollment to increase from 187 in 1937 to 3,600 in 2014 (Cooley & Floyd, 2013; NCES, 2015).

Consolidation is a strategy often implemented to increase school district quality without increasing expenditures (Gronberg, Jansen, Karakaplan, & Taylor, 2015). From a contradictory point of view, a reduction in local competition as a result of consolidation within the school market may reduce efficiency, and the funds saved through consolidation may be lost as a result

of this (De Haan, Leuven, & Oosterbeek, 2016; Gronberg et al., 2015). The researchers investigated this phenomenon within school districts in Texas, and found important economies of scale, but they also showed that increased market concentration lead to higher cost inefficiency (Gronberg et al., 2015). The researchers also attempted to illustrate a projected result through a simulation in which the factors were included and the effects were shown if consolidation were to be implemented to reduce school districts in Texas to county-level districts (Gronberg et al., 2015). The researchers succeeded in showing that failure to take into account the effect on competition may result in large overestimates regarding the benefits of consolidation (Gronberg et al., 2015).

Since the late 1930s, district consolidation has caused the number of school districts to plummet from around 130,000 in the early 1930s to around 14,000 in 2014, a drop of almost 90% (Cooley & Floyd, 2013; NCES, 2015). At the same time, K-12 public school enrollment rose from about 28,000,000 students to over 53,000,000, meaning that districts became bigger as did schools within them (Cooley & Floyd, 2013; NCES, 2015). For example, large urban areas, often with only one school district, such as New York, Los Angeles, and Chicago, today serve over 600,000 students each (NCES, 2015). Cooley and Floyd (2013) stated that all characteristics of a newly formed district are inevitably affected when school districts consolidate. Consolidation mainly occurs as a result of finances with regards to limited funds for rural areas. The benefits are a broadened curriculum, as well as possible increased academic performance (Cooley & Floyd, 2013).

Our current educational governance structures were formed out of a different era (Balcom, 2013). From the pre-industrial aged, locally governed, and small-scaled educational system to the one-size-fits-all approach of the early 20th century, the shift seems to be continual,

evidenced by larger school districts being created to better serve the needs of students, while at the same time seeming to be more cost efficient (Amis & Aïssaoui, 2013; Gershenson & Langbein, 2015). While this evolution was taking place and consolidation continued to affect thousands of districts, a significant divide of empirical evidence became apparent (Rogers, Glesner, & Meyers, 2014; Diaz, 2008; Riha, Slate, & Martinez-Garcia, 2013).

A detailed review of the literature suggested that no consensus exists, and the effect of variability in district size on student achievement and district expenditures remains an issue of intense and polarized debate (Cooley & Floyd, 2013; Bickel & Howley, 2000; Boser, 2013; Chingos et al., 2013; Howley et al., 2011; NASBE, 2003; Parrish, 2015; Schmidt & Schlottmann, 2007). This divide of empirical evidence has made the argument, either for or against consolidation, difficult to support, even as financial constraints continue to pressure policymakers across the nation, and has created a scenario in which any future consolidation reform will take place with conflicting guidance as to its effect on student achievement and district expenditure (Bickel & Howley, 2000; Boser, 2013; Chingos et al., 2013; Cooley & Floyd, 2013; Howley, 2000; Howley et al., 2011; NASBE, 2003; Parrish, 2015; Schmidt & Schlottmann, 2007). With 33% of the states currently supporting consolidation reform and almost 25% in the last decade attempting to do the same, consolidation will continue to be a popular option with policymakers, and will create a need for a better understanding of its effects (Balcom, 2013; Boser, 2013; Cooley & Floyd, 2013; Duncombe & Yinger, 2010; Howley et al., 2011; Welsch & Zimmer, 2016).

The Consolidation Debate

The consolidation debate is very divisive. Consolidation's proponents argue for combining school systems under the assumption that economies of scale would be derived from

creating a larger servicing base of students (Flowers, 2010; Gershenson & Langbein, 2015; Parrish, 2015; Preston, Jakubiec, & Kooymans, 2013; Riha et al., 2013; Rogers et al., 2014; Weldon, 2012). Opponents of consolidation claim that the benefits of consolidation seldom materialize, and that smaller districts increase relational aspects of schooling and subsequently provide a more conducive environment for the economies of scale to take place (Bolkan, 2013; Howley et al., 2011; Riha et al., 2013; Reingewertz, 2012; Schmidt & Schlottmann, 2007; Smithson, 2016;). An in-depth analysis is needed to determine the contexts and conditions of education quality within rural areas within the 50 states, and investigators should determine the need of new policies in order to address the issues within rural education (Johnson, Showalter, Klein, & Lester, 2014). Several researchers have investigated and shown the essential role that schools and districts play within a community to promote cohesion and increase development (Elliott, 2012; Willborn, 2013). One of the challenges that policymakers face is the application of theory for improvement within a community, as politics often end the process. Elliott (2012) further stated that it is of utmost importance to address why policymakers are implementing consolidation. Being more knowledgeable on the dynamics of consolidation will assist communities to advocate for their best interest and a most beneficial outcome for their community (Elliott, 2012; Willborn, 2013; Xia, Gao, & Shen, 2015).

A detailed review of these two conflicting camps of literature suggested that no consensus exists, and the effect of variability in district size on student achievement and district expenditures remains an issue of intense and polarized debate (Balcom, 2013; Boser, 2013; Duncombe & Yinger, 2010; Howley et al., 2011; Welsch & Zimmer, 2016).

Consolidation as beneficial. Several common themes throughout the literature support consolidation. The major theme is that larger districts are superior due to increasing the size of

operation, and allowing the economies of scale to improve the relationship of district expenditure with that of student achievement (Flowers, 2010; Gershenson & Langbein, 2015). Another common theme found in the literature emphasizes that increasing district enrollment lowers cost per pupil expense and frees up funds that could be used to improve the quality of education, as well as save taxpayers money (Heiney, 2014; Preston et al., 2013; Riha et al., 2013). Focusing on prevailing thoughts of the Industrial Revolution in which increasing production reduces the amount of duplicated services and therefore makes the education system more fiscally efficient, proponents for consolidation see it as a viable option to increase district efficiency (Howley et al., 2011; Preston et al., 2013; Riha et al., 2013). Policymakers as well as educators may look forward to future reforms, but it is necessary to understand why the current system is considered beneficial (Banicki & Murphy, 2014; Heiney, 2014).

The reduction of expenditures is certainly one of the main reasons for consolidation, and should more funds be available after consolidation, which could be allocated towards educational instruction, it may very well have a positive effect on academic performance. For example, Flaherty (2013) found that an increase in academic performance was related to higher expenditures on classroom instruction. In other words, as the district spent more money on regular instruction, the pass rate of students had increased (Flaherty, 2013). Flaherty (2013) used data from school years 2000–2001 up until 2008–2009 of 500 school districts and found a statistically significant positive relationship between the abovementioned variables. The highest significance was in students who were tested in grade 5 and later in grade 8, as well as learners who were tested in grade 8 and again in grade 11 (Flaherty, 2013). This argument adds much merit to the premise of consolidation, with it being an indirect influence on student achievement in this way. In contradiction to Flaherty, Hayek (2013) suggested that while consolidation may

be beneficial for certain school districts to decrease expenditures, it might not be beneficial towards student achievement.

Various factors influence the decision of board members and other influencing parties to consolidate. Haagenson (2015) determined that plummeting enrollment numbers were the most significant factor when voting to consolidate. Other factors, such as declining programs and services, insufficient staffing and training, as well as declining finances, were secondary factors (Haagenson, 2015).

In his study on consolidation conducted in Israel, Reingewertz (2012) found that the consolidation of the municipalities in Israel since 2003 had decreased expenditures by 9%. According to Brasington (2013), municipalities are allowed to consolidate their services if they are contiguous, and normally voting takes place independently. Consolidation is an effective policy used by developed countries to minimize municipal provision of services and, in turn, reduce costs (López-Torres & Prior, 2016). One significant obstacle faced when consolidating municipalities lies in the fact that there is a perceived loss of political power as well as a decrease in control associated with service consolidation (Leland & Thurmaier, 2014). Reingewertz (2012) furthermore stated in contradiction that the empirical literature shows almost no evidence of benefits as a result of consolidation.

In his study for the Center for American Progress, Boser (2013) conducted an analysis of current spending and district size across the country, and concluded that the continued existence of small rural districts may represent $1 billion dollars of lost cost every year. Boser (2013) contended that there is a viable need for states and districts to reform school management systems, and claimed doing so would enact the economies of scale as well as give more local control of spending reform to grassroots decision makers. Through the use of shared services and

resources through regionalization, Boser (2013) claimed that districts could reduce a significant amount of spending my eliminating the duplication of services. According to Preston et al. (2013) and data accumulated from 2003-2013, principals in rural areas in America, Canada, and Australia struggle to find work in these areas when responding to advertisements. Historical ties in rural areas seem to carry more weight. Other struggles in rural areas included diverse responsibilities, lack of professionalism and resources, gender discrimination, and challenges regarding school accountability as well as willingness to change (Preston et al., 2013). Although unusual, administrators in some rural school districts have followed a very controversial route to increase enrollment, as enrollment numbers continue to decrease. In an attempt to increase enrollment and keep school size at a cost-effective level, as well as increase the diversity within school, schools recruit international students (Casto, Steinhauer, & Pollock, 2013; Fisher, 2012; Redden, 2012).

As stated previously, many diverse opinions as well as literature exist on the effects of school district consolidation and student achievement. For example, Nguyen-Hoang and Yinger (2014) investigated the academic performance of students who were affected by the education finance reform of 1993 in Massachusetts. They showed that the education reform assisted with significantly higher academic achievement (Nguyen-Hoang & Yinger, 2014).

In another study, Cullen, Polnick, Robles-Piña, and Slate (2015) also found the benefits of higher expenditures on education. The researchers investigated whether instructional expenditures had an effect on academic performance for students in Texas public schools from 2005–2010 (Cullen et al., 2015). They analyzed the academic achievement of students on their results of the state tests for the 5 years mentioned. They included all school districts in Texas, and compared their results to the expenditure ration of each school district. They showed

significant differences for the subjects compared, which were reading, math, writing, science, and social studies (Cullen et al., 2015). The authors found a statistically significant positive relationship between instructional expenditure and academic performance, especially for math and science. They found that school districts with higher instructional expenditure showed consistently higher academic performance compared to districts with lower instructional expenditure (Cullen et al., 2015).

In their study conducted in New Hampshire, Lee, Lu, Sieredzinski, and Zervos (2016) showed the benefits of consolidation while not compromising the quality of education, and without increasing the individual cost of students with regard to transportation, for example. The researchers posited that consolidation may be a cost effective measure and very beneficial for districts in New Hampshire, as the previous years had shown a decline in enrollment and shrinkage in school-age population (Lee et al., 2016). The researchers found that, according to the demographics of New Hampshire, it would be most beneficial for this state to consolidate within areas classified as non-rural and non-remote (Lee et al., 2016). They found that consolidation in these areas would be least likely to induce losses in educational measures and higher expenditures for students (Lee et al., 2016).

Many researchers have investigated the effect that school size has on the academic performance of students, specifically for learners on an elementary or high school level, and have mostly found that the academic performance of students is higher in larger schools when compared to learners enrolled in smaller schools (Humlum & Smith, 2015; Moore, Combs, & Slate, 2014; Riha et al., 2013). For example, Barnes and Slate (2014) investigated the relationship between school district size and student performance of Limited English Proficient students in Texas for the school year concluded in 2011. They used data obtained from the Texas

Education Agency Academic Excellence Indicator System to indicate school district size, and Texas Assessment of Knowledge and Skills to measure subjects, including English and Mathematics pass rates for these students. They classified school district sizes with small-size districts as 28-1,599 students, moderate-size school districts as 1,600-9,999 students, and large-size school districts as 10,000-203,066 students (Barnes & Slate, 2014). They found student achievement to be significantly higher for Limited English Proficient students in larger school districts when compared to moderate-size and small-size school districts (Barnes & Slate, 2014). This information is of high significance. It can be argued that the effect observed in Texas can easily be duplicated in other states for Limited English Proficiency students, and may even be similar for all students.

In their research, Duncombe and Yinger (2010) found that services provided by specific education professionals might not decrease due to size as often believed). They cited the fact that all districts require certain central administration, and there is little evidence to believe that the relationships and services touted by smaller districts are impossible to achieve on a larger scale (Duncombe & Yinger, 2010). Another reason why consolidation makes sense is due to the physical capital required to run a school district, such as heating and cooling systems (Duncombe & Yinger, 2010). The ability to hire and retain more specialized teachers to offer a wider range of classes as well as better meet the needs of students with special needs is another reason consolidation is seen to improve academics. The last main reason that Duncombe and Yinger (2010) pointed out as to why larger districts make more sense is due to the increased levels of collaboration opportunities of like-minded individuals. Having more employees creates a more conducive environment for professionals to be able to learn from one another.

In examining the factors that lead to policies that support consolidation, Preston et al. (2013) presented several catalysts to the movement, such as the first legislative action that provided for free public transportation. The invention of the automobile as well as the commonality of paved roads heavily influenced this event that took place in Massachusetts, which led to greater accessible travel for school-age children and decreased the need for many one-room schools that were built for early settlers (Preston et al., 2013). Another catalyst for the consolidation movement was the rise of industrialization in urban areas in the late 19th century (Preston et al., 2013).

The prevailing belief by early reformers and policymakers was that educational services could be maximized by adopting organizational techniques from industry, hence they strongly encouraged all schools to look and function alike, and this included consolidating districts and schools in order to achieve this (Preston et al., 2013). The authors also cited how private businesses, such as the International Harvester Company, promoted consolidation by placing promotional ads in educational literature of school buses (Preston et al., 2013).

Silvernail and Sloan (2004) found potential for substantial savings through consolidation in a study of school district size and its effects of student achievement and district expenditures in the state of Maine. They indicated that while increasing district size decreases district expenditure, student achievement was not harmed (Silvernail & Sloan, 2004). Therefore, due to consolidation resulting in increased efficiencies without worsening outcomes of student performance, the economies of scale provided potential overall efficiencies (Silvernail & Sloan, 2004).

In looking at the effects of district size on both small and large rural districts in Pennsylvania, Gong (2005) concluded that there were significant benefits to larger districts

versus smaller ones. While Gong showed no difference between the two sizes in terms of per pupil expenditure, school staffing, and curricular offerings, large rural districts had more course offerings and significantly higher standardized test scores. Gong went on to state that his findings provided evidence that the effect of district size on student achievement is more non-direct than direct.

Consolidation as detrimental. Several researchers throughout the literature make claims in opposition to consolidation. One of those claims focuses on how smaller districts are superior at creating and fostering stronger social connections between district personnel and students (Howley & Bickel, 2000; Parrish, 2015; Schmidt & Schlottmann, 2007; Smithson, 2016). Welsch and Zimmer (2016) stated that standardized (state) tests are available to the public, and thus these results should be continuously analyzed in accordance to the school size. They also stated that feedback on the effect of school size is of high importance, and that it may even be able to predict future school size. Their model showed an increased negative relationship between school size and student achievement (Mills, McGee, & Greene, 2013; Welsch & Zimmer, 2016).

Foster (2015) stated that rural communities are consolidating, and often closing, at an alarming rate across the entire country. Consolidation continues to be an implementation that results in diverse reactions, but in rural areas, tension is most often the result. Foster (2015) claimed that schools in rural areas provide for education while creating jobs and providing entertainment. The social relationships obtained through a school may even reach regionally, and is of high importance for cohesion within any community. Foster (2015) showed that a definite relationship exists amongst the opening and closing of the school within one specific community (Mount Hope) and the cohesion present within certain groups identified in the community. The

researcher furthermore found that school closure negatively affected social activities unrelated to the school (Foster, 2015). The results of this qualitative study provide significant insight when arguing against consolidation (Foster, 2015). Foster (2015) suggested that communities and school districts should be allowed to debate for the well-being of their own communities before consolidation is implemented. The school can be perceived as the driver behind many rural areas, and without it, smaller towns may cease to exist (Foster, 2015).

In agreement with Foster on the negative affects of school closure or school district consolidation, in a yearlong quantitative study conducted in Illinois, Billger and Beck (2012) investigated the possibility of causal relationships between a decrease in population and agricultural consolidation as well as school closures. Some see these variables as the leading cause of the overarching decline in rural America (Billger & Beck, 2012). History shows the shifting economy of the US regarding job demand changing from agricultural to manufacturing has led to the population flocking to urban areas, significantly reducing the rural population. This shift results in schools closing down or giving in to consolidation as enrollment numbers continually decrease. A continuous loss of population results in further agricultural consolidation, whereas school closures also lead to further population loss (Billger & Beck, 2012).

Furthermore, anti-consolidation supporters claim the social connection between districts leads to increased attendance, additional engagement in curricular and extra-curricular activities, and an overall increase in shared responsibility of success (Duke et al., 2009; Parrish, 2015; Reingewertz, 2012; Smithson, 2016; Yan, 2006). According to Cooley and Floyd (2013), the negative side of school district consolidation includes the impact on communities. Communities are negatively implicated as students have to arrange new transport to the new school, and

closing local schools affects the communities emotionally; as a result, better academic achievement is not guaranteed (Cooley & Floyd, 2013). The main aim, where consolidation becomes an option, would be to attempt to determine the positive and negative outcomes before consolidation is implemented. Taking all the contradictory literature into account, this may be very difficult, and yet it could prevent unnecessary repercussions.

In identifying more faults of consolidation, researchers also focus on highlighting the claims that the financial and achievement benefits of consolidation are vastly overestimated (Howley et al., 2011; Schmidt & Schlottmann, 2007; Smithson, 2016). Additionally, researchers make claims that simply increasing district enrollment is not a reasonable solution to increasing student achievement and decreasing district expenditure (Reingewertz, 2012; Riha et al., 2013; Welsch & Zimmer, 2016). One should also keep in mind that there are other influences on student achievement as well. The perception that learners have of the school, their sense of belonging, classroom engagement, and bullying may also affect academic achievement (Ogaz, 2016). Furthermore, Parrish (2015) indicated that school factors, such as teacher expectations, safety, and teacher and student relationships, had the most significant effect on student attendance.

In another study, Molitor (2014) showed the significance of perceived positive communication between the school and school district governing bodies to have a significant positive affect on academic performance. The researcher included 19 high schools and 14 districts in this quantitative study. The perceived positive relationship between the teachers and school administrators as well as the school district governing bodies directly affected teacher efficacy, and thus had an indirect positive influence on academic performance (Molitor, 2014). Therefore, the importance of communication is of high significance. It can thus be argued that

fewer districts may allow for easier communication, as the responsibilities decrease for district governing bodies when policymakers implement consolidation. District-wide communication should therefore be taken into account as an important variable influencing academic performance (Molitor, 2014).

Miller (2013) found that the expenditures allocated per pupil did not have a significant effect on student achievement for students from grade 2 to 11 in California, but that expenditures focused on specific educational inputs may result in great gains or losses in student achievement (Miller, 2013). Miller's results were inconclusive, as he measured academic achievement for math and English and found a statistically significant correlation, and yet the correlations differed greatly across grade levels and categories (Miller, 2013). The results Miller (2013) found add to the already vast difference in results in the current literature, as policymakers mainly implement consolidation in order to have financial gains. Miller showed that higher expenditures per pupil or for educational inputs would not necessarily result in greater academic achievement.

In 2012, Kennedy and Tolbert conducted a research study examining the importance of district size as it relates to district performance. One of the variables they examined was the economy of scale for school districts. In their results, Kennedy and Tolbert (2012) concluded, "…economic benefits are not necessarily achieved by consolidation into larger districts" (p. 4). Kennedy and Tolbert went on to state that from their findings, one can also conclude that when comparing standardized test scores, smaller school districts outperform or provide better academic success than that of their larger district counterparts.

Antonucci (2013) examined the differences in per-pupil spending between the largest districts in each state and all of the other districts in that particular state. Antonucci (2013) found

that 28 states had large districts outspending smaller ones. The findings did not disprove the claim of higher expenditure for small districts, but rather provided empirical evidence that large districts are not always more cost effective than their smaller counterparts (Antonucci, 2013). Cooley and Floyd (2013) were in agreement with Antonucci (2013). They used a quantitative approach to determine the expenditures and academic performance of consolidated and non-consolidated small, rural schools in Texas. They focused on third, fifth, and eighth grade students. They collected data on academic performance and expenditures for 10 years between 1999 and 2009 (Cooley & Floyd, 2013). The results of the study, with the use of appropriate *t*-tests, showed that the expenditures for pupils increased and that academic achievement for the absorbing district decreased.

In 2007, the Nevada Policy Research Institute published an analysis of consolidation reform written by Schmidt and Schlottmann that examined the effects of district size, and concluded that the negative affects of large school districts outweigh the positive. In their analysis, they concluded that district size does matter when it comes to student achievement and expenditure, and that all involved parties are better off where school districts are smaller (Schmidt & Schlottmann, 2007). They further conceded that the economies of scale do have a positive influence in the education system; however, they pointed out that in education there is a point (or rather size) at which the economies of scale begin to have a negative affect on student achievement and district expenditure (Schmidt & Schlottmann, 2007). Ross, Hall, and Resh (2013) and Hall (2015) found that significantly larger class sizes are implicated when schools fall within non-congruent borders, and is also increased as the degree of non-congruence rises. Larger classes should be considered carefully before consolidation occurs, as it may imply less individual attention for students.

Rogers et al. (2014) empirically examined the relationship between district size and expenditure in the state of Michigan, and had two major findings. The first finding was that an ideal school district size of roughly 2,900 students was the most cost-effective size for school districts in Michigan to optimize spending. The second finding was that the state would reduce educational spending by $363 million per year through breaking up excessively larger districts (Rogers et al., 2014).

Yan (2006) conducted a research study that examined student achievement and cost efficiency in Pennsylvania school districts, and did not find any evidence that larger districts are superior in terms of cutting costs or student achievement. Yan found very little statistical significance between the three types of school districts examined (rural countywide, rural non-countywide, and rural-urban districts) and only a small percentage of students in rural-urban school districts had test results significantly higher than the other two types (Yan, 2006). Yan (2006) also indicated that students from rural countywide districts were less likely to go to degree-granting and non degree-granting institutions after graduation.

Nguyen-Hoang & Yinger (2014) examined the effects of consolidation across states over the time period that saw the highest number of consolidations (1930-1970). They concluded that the modest gains associated with larger districts were often outweighed by the harmful effect of larger schools (Nguyen-Hoang & Yinger, 2014). They found evidence that students from states with smaller schools and districts had larger returns of academics and also completed more years of schooling (Nguyen-Hoang & Yinger, 2014). The researchers went on to state that they are cautious in interpreting their findings to conclude that smaller districts are superior due to a need for future research that could extend their analysis (Nguyen-Hoang & Yinger, 2014).

In a research study conducted for the National Rural Education Association, Preston et al. (2013) reviewed the literature on district consolidation with respect to economies of size and student achievement, and concluded that, while some consolidation situations might be inevitable, there was little evidence to support arbitrary state-level mandated consolidations. The researchers found that the educational and financial gains expected from consolidation often do not match the actual outcomes. Also, smaller districts have higher academic achievement, and students report greater levels of satisfaction in regard to social aspects of schooling. Lastly, they concluded that, as a district grows, a larger percentage of resources become devoted to secondary and non-essential activities (Preston et al., 2013).

In a study that examined differences in adult wage earnings based on the size of district attended, Amis and Aïssaoui (2013) found very little evidence that consolidation had any effect on the variance of outcomes. Furthermore, they provided evidence that students from larger school systems who did not complete high school have reduced levels of inequality than those students who also did not graduate from high school, but attended smaller school systems (Amis & Aïssaoui, 2013). They also noted that state governments' attempt to greater centralize its funding through larger districts had no equalizing effects on student achievement nor district expenditures (Amis & Aïssaoui, 2013).

Cooley and Floyd (2004) conducted an ex post facto quantitative study examining the effects of consolidation of rural Texas schools to determine if consolidation would increase student achievement and decrease expenditures. When looking at expenditures before and after as well as comparing passing percentages on state assessments, very little evidence suggested consolidation positively affected either of the variables tested (Cooley & Floyd, 2004). In fact, the results did show that districts that absorbed one or more districts through consolidation

experienced statistically significant decreases in student achievement as well as statistically significant increases in district expenditures (Cooley & Floyd, 2004; Duncombe, Yinger, & Zhang, 2014).

In an effort to examine statewide effect of district size on student achievement, Parrish (2015) used school-level data provided by the California Department of Education (CDE) to examine the effect school district size has on student academic performance. Through the use of state achievement tests, while controlling for characteristics of student population and other environmental factors, district size appeared to have a significant positive effect on student academic performance (Parrish, 2015). Even after controlling for environmental factors, Parrish (2015) concluded that district size hinders student achievement, having the largest effect on middle school students, and supported reducing district size as a means to increase student achievement (Parrish, 2015).

In their 2000 study, Jacques, Brorsen, and Richter examined the effects of district size in conjunction with student performance in Oklahoma City school districts. They concluded that school district consolidation would likely reduce both expenditure and student achievement. Their findings showed positive effects of economies of scale, however, with the results being directly linked to the performance of lower levels for
students (Jacques et al., 2000).

In a nationwide study that conducted a cross-sectional data analysis from the 99 largest schools in the United States to examine the cost efficiency of larger school districts, Riha et al. (2013) found that none of the claims proposed by modern supports of consolidation were valid. The researchers concluded that the assumptions of larger schools being more cost effective were

inconsistent (Riha et al., 2013). They found that larger school districts did not have any positive effects on economies of scale nor student performance (Riha et al., 2013).

Stevenson (2006) reviewed and analyzed eight South Carolina statewide studies that dealt with district size and student achievement. In his research, Stevenson examined many of the same variables that have led to the conclusion that bigger districts are not always better. Based on the results of these eight statewide studies, Stevenson concluded that there is no significant influence that large school districts have on either costs or student performance. Stevenson (2006) further pointed out that smaller schools allow more opportunities for students to be involved in co-curricular activities and offer more personalization and individual attention than larger schools, and based on a combination of his own research findings and review of other work on school size, has raised doubt about the cost effectiveness of larger schools. Stevenson argued that when dropout/graduation rates are taken into account, smaller schools actually are more cost efficient when it comes to student achievement and district expenditure.

Goldilocks Discrepancies

While a significant majority of the research focuses on one side of the consolidation debate or the other, some investigators have focused on determining the ideal district size. In this literature, the claimed ideal minimum size for a district is anywhere in the range of 400-2,000 students per district (Bingler et al., 2002; Dumcombe, 2007; Nguyen-Hoang & Yinger, 2014; Howley et al., 2011; Indiana State Legislation, 2007; Inerman & Otto, 2003; Preston et al., 2013; Rogers et al., 2014). Current researchers claim that the ideal maximum size for a district is anywhere from 4,000 to 6,000 students per district (Bingler et al., 2002; Dumcombe, 2007; Howley et al., 2011; Nguyen-Hoang & Yinger, 2014; Indiana State Legislation, 2007; Inerman & Otto, 2003; Preston et al., 2013; Rogers et al., 2014). Besides the inconsistencies in their

results, these studies present findings that are very broad and unspecific, and include ranges of size that very few districts currently fall under, providing little guidance to future consolidations and consolidation legislation.

To add more confusion to the current literature landscape, Gershenson and Langbein (2015) also stated that optimal school size remains a mystery. They focused their study on the academic performance of fourth and fifth graders in North Carolina, with the school size of students being the main variable. They made use of longitudinal administrative data and linear time trends, and analyzed teacher-by-school, student, and school-by-year fixed effects. They determined that there is no evidence of a causal relationship including school size and student achievement (Gershenson & Langbein, 2015). It may be notable that they did find significant relationships between student achievement and school size for the subgroups of learners with learning disabilities and learners who are socioeconomically disadvantaged. More specifically, an increase of 10 students per grade affected math and reading performance negatively (Gershenson & Langbein, 2015).

Dobbie and Fryer (2013) were in agreement with Gershenson and Langbein (2015), and they also added further effects on school achievement, which they discovered during their qualitative analysis on the variables affecting school achievement (Dobbie & Fryer, 2013). They found that the size of classes, the expenditures per-pupil, and the certification of teachers and their training do not affect school effectiveness significantly. Furthermore, they showed that increased instructional time, frequent feedback from teachers, high expectations, high-dosage tutoring, and the use of data to guide instruction added to about 45% of school effectiveness (Dobbie & Fryer, 2013).

Dumcombe and Yinger, two professors who have done extensive research on the consolidation issue, concluded through several of their studies that a workable definition of small districts is in the range of 400-1,600, with a "sweet spot" for maximum efficiency being around 3,000 students and diseconomies of scale occurring as a district exceeds 6,000 students (Dumcombe & Yinger, 2007, 2010). In both studies, the authors found strong evidence of economies of size for small districts and made several references to research that focuses on the potential savings districts could gain when moving from smaller districts to larger ones (Dumcombe & Yinger, 2007, 2010). Specifically, annual operating spending per pupil declines by 61.7% when two 300-student districts consolidate, and by 49.6% when the consolidating districts are 1,500 students each (Dumcombe & Yinger, 2010). The researchers showed particularly large savings for instruction and administrative cost (Dumcombe & Yinger, 2007).

As previously mentioned, Rogers et al. (2014) examined the most cost-effective size school district in the state of Michigan, and found that the number is roughly 2,900. Their findings were based on the relationship between district size and per-pupil expenditure, and did not include student achievement. Their study is unique in that it declares a definite number versus a range, and focuses more on how the incentive structure that the state offers is cost prohibited due to the difficulty of performing a consolidation where the ideal district size of 2,900 is met (Rogers et al., 2014).

Dumcombe and Yinger provided a literary review of research that studied the economies of scale of districts in the United States. The review concluded that evidence exists to support districts of approximately 2,000 to 4,000 that have greater ability to lower cost per pupil when compared to districts with less than 500 students. They also concluded that the minimum-cost size for a district is approximately 6,000 students. Although this review provided sound

information on a national scale, it provided little guidance on the cost-saving potential of a specific state that might not include normal ranges of district sizes.

In 2000, Jacques et al. studied the effects of district size on student achievement, and district expenditure for districts in Oklahoma. By using a nonlinear regression analysis, Jacques et al. concluded that economies of scale exist for districts with enrollment of up to 965 students. Additionally, they concluded that districts larger than the ideal number of 965 tend to have lower student achievement, and that massive consolidation of districts in Oklahoma would reduce both district expenditure and student achievement.

In a study examining the cost effectiveness of school district in Iowa, Inerman and Otto (2003) determined that costs per student rise when district enrollment drops below 750 students, and when enrollment rises past 2,750 students. Although the research shows a definite relationship between district size and expenditure, there is significantly more variation with the smaller districts than with the larger ones. This research was simple analyses of the factors that contribute to costs per student, and did not quantify student outcome or educational quality.

Consolidation and State Legislatures

Policymakers across the nation are continually looking for ways to increase student achievement and decrease district expenditure through the manipulation of district size (Balcom, 2013; Duncombe & Yinger, 2010; Howley et al., 2011; Welsch & Zimmer, 2016). Thirty-three percent of the states currently have active legislation that is contradictory to the economies of scale benefits of consolidation (Boser, 2013; Duncombe & Yinger, 2010; Howley et al., 2011). Twenty-five percent of state legislatures have had some type of mandatory or incentivized district consolidation legislation be proposed or passed in the last decade alone (Boser, 2013; Preston et al., 2013; Reingewertz, 2012; Rogers et al., 2014; Weldon, 2012). Ayscue and Orfield

(2015a/b) suggested that highly fragmented areas should make use of regional strategies, including, among others, inter-district transfer programs and district consolidation, to reduce segregation within schools across district lines. They further noted that highly fragmented states cannot accomplish the above-mentioned on their own, and that segregation has many negative effects on educational opportunities and educational success (Ayscue & Orfield, 2015a, 2015b).

A number of state legislatures have promoted wide-scale consolidation, offering state funds to help build newly-consolidated schools that meet certain requirements, while other states offer direct financial inducements to encourage consolidation, all with the purpose of cutting district expenditure (Balcom, 2013; Boser, 2013; Duncombe & Yinger, 2010; Howley et al., 2011). Being able to efficiently increase student achievement, or being able to decrease district expenditure without harming student performance, ideally is the main goal of district consolidation reform; however, this does not seem to hold true. As numerous recent state legislative initiatives have shown, a majority of the pressure for a school district to consolidate comes from a financial perspective rather than an academic one (Balcom, 2013; Boser, 2013; Cooley & Floyd, 2013; Silvernail & Sloan, 2004). This district consolidation push has proven to be extremely influential in the way educational leaders and visionaries continue to model their frame of thinking, and as this comprehensive review of the literature showed, the effect of this influence is evident throughout the country (Parrish, 2015).

The state of Vermont, home of the highest cost-per-pupil rate in the nation at an average of $18,000, has more than 280 districts serving just 80,000 students (Burnette, 2016). Seventy-nine have less than 100 students and one district has only 19 students (Burnette, 2016). In December 2012, the Vermont Education Commissioner called for the Vermont legislature to change current structure by requiring school districts with fewer than 1,500 students to

consolidate with neighboring districts. The Commissioner's plan called for mergers enforceable by state mandates and restricted state funding, as well as state funding to expedite such mergers (VAE, 2011).

Claiming that many school districts in Indiana were not large enough to maximize the benefits of economies of size, the Indiana General Assembly commissioned a study to examine the efficiency of local governing bodies, including the state's school districts. In December 2007, the Indiana Commission on Local Government Reform made recommendations on school reform, calling for schools to be reorganized to have a minimum student population of 2,000, as well as creating local plans for joint purchasing. The Indiana State Board of Education has since approved these recommendations (ICLGC, 2007).

Michigan governor Jennifer Granholm has advocated the state legislation to give her the power to force district mergers (Rogers et al., 2014). She claimed that merging small districts would mean increasing public school efficiency; however, she had very little empirical evidence to back her claim. In fact, the study done by Rogers et al. (2014), in their own state, clearly stated that consolidation of small districts does not meet the financial savings, as would breaking down larger districts.

In 2006, the Governor of Maine proposed and the legislature enacted a massive restructuring program for schools districts. The law required all school districts to work together to reorganize into the most efficient models. Schools were given until December of 2007 to submit required consolidation plans to the Education Commissioner. Among other guidelines under the program, all districts needed to have a student population of 2,500. The program's goal was to reduce the state's school districts from 290 to 80. The state forced consolidation through

withholding state aid and other financial benefits (Main State Board of Education [MSBE], 2011).

During the 2006 Special Session on Property Taxes of the State of New Jersey, the Joint Committee on Government Consolidation and Shared Services recommended a pilot program for countywide school districts. Legislators introduced a bill to enact this recommendation, which passed in only one house of legislation mainly due to local opposition in the pilot county. Legislators also enacted a bill that gave county superintendents (who are appointed by the Governor) the authority to eliminate non-operating unit districts, to create K-12 districts, to provide administrative services, and to approve certain expenditures of school districts (New Jersey Sate Board of Education [NJSBE], 2007).

In 2004, the Kansas Legislature passed Senate Bill 304, which created a "cooperative endeavor" between three Kansas universities called the Center for Innovative School Leadership (CISL) (Church & Bland, 2012). Its purpose was to provide school districts with suggestions on ways to improve efficiency within (Church & Bland, 2012). CISL has allowed for consultation to state legislatures and boards of education on ways to improve financial efficiencies, but yet contains little discussion centered on student achievement.

In November 2002, the Arkansas Supreme Court ordered education reforms to be put into place. Governor Mike Huckabee proposed legislation that called for the consolidation of districts with student populations of fewer than 1,500 students, which accounted for two-thirds of the state's school districts. In 2004, legislators enacted policy that forced school districts with fewer than 350 students to consolidate with a neighboring school district. In 2005, the state Supreme Court, overseeing the reform, reported that the guides of this mandate were still not in full

compliance with the 2002 ruling, and suggested further district consolidation (Arkansas Board of Education [ABE], 2010).

Some states even have policy that contradicts itself. In a revised version of the North Carolina Department of Education Facilities Guide, it recommends "elementary schools ranging from 450 to 700 students, middle schools ranging from 600 to 800 students, and high schools ranging from 800 to 1,200 students" (North Carolina Department of Public Instruction, 2014, p. 1). Included in the same publication is a section on district size that states the following: "Research on school climate and safety suggest, however, that smaller school sizes may have certain advantages" (p. 2). There is a positive relationship between smaller school size and a number of variables associated with school climate and order. Researchers on school size indicate ideal school sizes for improved safety and violence reduction to be: "Elementary: 300 to 400 students, Middle: 300 to 600 students, High: 400 to 800 students" (North Carolina Department of Public Instruction, 2014, p. 2).

District consolidation and state policymakers have proven to be extremely influential in the way educational leaders and visionaries continue to model their frame of thinking and, as this comprehensive review of the literature shows, the affect of this is evident throughout the country (Parrish, 2015). Twenty-five percent of state legislatures have had some type of mandatory or incentivized district consolidation legislation proposed or passed in the last decade alone; it is evident that the issue of consolidation is still a topic of debate (Boser, 2013; PSBA, 2009; Preston et al., 2013; Rogers et al., 2014; Reingewertz, 2012; Weldon, 2012). Without a consensus on the ideal school district size, consolidation legislation lacks the guidance it needs to fulfill its basic purpose of creating districts that provide increased educational outcomes with decreased expenditures.

Consolidation and Illinois

With the data analysis for this study coming from the state of Illinois, it seemed fitting to address how consolidation has affected the public education system in the state, as well as why Illinois' current public school organization created an ideal environment for the consolidation debate to take place. Illinois rates in the top of several national comparison categories related to the benefits of consolidation (Boser, 2013; Dabrowski & Klingner, 2016; NEA, 2014; Weldon, 2012). Illinois' political history, as well as more recent times, has engulfed the consolidation debate, often escalating to become a primary gubernatorial issue (Dabrowski & Klingner, 2016; State of Illinois, 2011; ISBE, 2015; Ward & Rink, 1992). Additionally, Illinois has many districts that meet the ideal prerequisites for consolidation (Dabrowski & Klingner, 2016; NEA, 2014).

Under the guidance of then State Superintendent Ted Sanders, the Illinois General Assembly in 1985 enacted a broad set of education reform initiatives known as the Education Reform Package (ERP) of 1985. Among its primary purpose of reforming the quality of the state's public education through better appropriations of state monies, ERP sought to emphasize both the educational quality and financial efficiency in larger school districts (Ward & Rink, 1992). ERP called for establishing committees of school district consolidations in every region of the state. The purpose of these committees was to determine which smaller districts could be consolidated into bigger ones. The committees were to develop plans that would then be submitted to the voters of the regions; however, there were never any provisions that placed any forced consolidation without electoral consent (Ward & Rink, 1992).

ERP also lead to the beginnings of a formal state support plan for school districts to conceive the possibility of and to entice them to look for efficiency in reorganization. Along

with massive financial incentives of General State Aid Difference (18-8.05(I)), Teacher Salary Equalization (18-8.2), Deficit Fund Balance (18-8.3), and $4,000 per Full-Time Certified Staff (18-8.5) the plan also lead to the six types of district reorganization options that are approved and supported by the Illinois State Board of Education (ISBE, 2016). These six main types of reorganization are: Consolidation, Unit District Conversion, Partial Elementary Unit District Formation, Annexation, High School Deactivation, and Cooperative High School Attendance Centers (ISBE, 2016).

Depending on the district size, type, and location, each one may be considered by districts looking to reorganize. Consolidation is the merging of two or more existing districts to create a completely new district. Unit District Conversion generally involves creating a single new high school or elementary school district with the dissolving of a unit district, two or more contingent unit districts or one or more unit districts and one or more high school districts. Partial Elementary Unit District Reorganization is when a Unit district serves all students in grades 9-12 within its territory but only some of the feeder elementary schools within the same territory. Annexation involves either detaching part of a school district and annexing it to another school district or dissolving the school district into more then one school districts. High School Deactivation consists of a school district deactivating its program and sending its students to one or more neighboring high schools. Lastly, Cooperative High School Attendance Centers and is the joining of two or more contiguous unit or high schools into one or more cooperative high school attendance centers.

In the 1986 gubernatorial race, school district consolidation became a main issue between the candidates. This led to statewide opposition to school district consolidation from parents, community members, and school officials. Studies and counter-studies began to appear, as well

as new coalitions and organizations that sought to combat school district consolidations. The issue of school district consolidation became a highly-debated topic in multiple levels of governments as well as state level conferences (Ward & Rink, 1992).

Consolidation of school districts continued, and in 2006, the Illinois General Assembly passed a new consolidation law known as P.A. 94-1019. By providing monetary support for many segments that consolidation brings with it, from paying 70% of the research firm's cost to balancing out the difference of faculty pay for a certain time period if districts were to consolidate, P.A. 94-1019 passed with financially-struggling districts in mind (Illinois General Assembly, 2006). While this legislation was not a forced district consolidation law, its purpose was to offer districts different types of ways to consolidate as well as to provide financial incentives that would make consolidating much more appealing to them. Its affects were evident, as by 2016, the number of school district had been reduced to 858 from 874 in 2007 (ISBE, 2016).

In the summer of 2011, Illinois Governor, Pat Quinn, stated that he "…planned to appoint a commission to review the issue with hopes to introduce mandatory school district consolidation" (Quinn, 2011). It was the Governor's claim that this would result in state legislation that would reduce Illinois' school districts to no more than 300. "If we have fewer districts, as many states do, we can find ways to economize" (*Chicago Tribune,* 2012,). The Governor's office confirmed that the governor was "looking into a tentative plan that would involve mandatory mergers, rather than voluntary ones" (AP, 2011).

This commission led to the proposal and adoption of Illinois House Bill 1216 (2011) and became known as Public Act 97-0503 (2011). PA 97-0503 established the Classrooms First Commission (CFC) to study the issue of district consolidation in order to, "improve service

delivery efficiencies, including instructional, financial, operational, and administrative services" (CFC, 2012, p. 3). At the time, the state of Illinois had seen a 10% decrease in public educational funding over the past four years on top of increasing educational expectations (ISBE, 2012). The results of the CFC were to propose a more supportive and simplistic consolidation incentive plan in order to "improve educational opportunities for public school students and improve efficient use of educational resources" (CFC, 2012, p. 3).

Rather than providing a specific frame of reference for an ideal school district size, the commission focused on recommendations that would allow school districts and the state to save money, such as ways school districts could engage the state community in conversations about consolidation, and looking at the hard numbers of both the current district consolidation incentives as well as forced consolidation costs. The CFC pointed to the counterproductive incentives that the state offers districts to consolidate as problematic to consolidation being a cost-saver for the state. The CFC found that in order for the state to drastically reduce the number of districts, some types of consolidation, such as Unit Consolidation, could cost the state upwards of $3.7 billion under the current statues based on estimated cost associated to the Salary Differential ($3.1 billion over 4 years) and the $4,000 per Certified Staff ($610.5 million over 3 years) incentives (CFC, 2012).

The CFC made recommendations of ways districts and the state could save money, such as sharing administrators and buying school supplies in bulk and then dispersing them to several neighboring districts (CFC, 2012). Rather than fully supporting the governor's vision of reducing state cost through consolidation, the CFC concluded that, "bigger was not always better" and that it was, "…possible to achieve greater fiscal efficiency and higher-quality academic programs through targeted and thoughtfully planned consolidation" (CFC, 2012, p. 11).

The CFC findings have led to a reevaluation of current Illinois law; as stated by former Governor Pat Quinn, "We need to make adjustments in the current law, because I don't think current law would envision the kind of fundamental restructuring we hope to get" (*Chicago Tribune,* 2012). In a final review, the CFC failed to examine specific statistical evidence to make a recommendation of an ideal district size, and simply based its findings on how districts seem to function as well as qualitative data.

Since the passing of P.A. 94-1019 (2006), there has only been a reduction of 16 school districts (ISBE, 2016). In the same number of years before the passing of P.A. 94-1019, there was a reduction of 23 school districts, from 897 in 2000 to 874 in 2007 (ISBE, 2013). This decrease in the number of district consolidations has lead to the continuation of school district consolidation policy at the state level (ISBE, 2016).

Summary

In the review of the literature, the current researcher has examined the most recent research on the topic of consolidation and district size. He also included recent research on the effects of consolidation on communities and student achievement. Furthermore, the research also investigated the benefits and disadvantages of consolidation, as well as what the research shows to be the ideal school size.

Specifically, the current researcher explored the historical ramifications and evolution of district consolidation, evidence from studies that support differing sides of consolidation, the results from state bureaucratic agendas across the country, and the policies and procedures of the state of Illinois. The literature teaches that consolidation is considered one of the most influential educational reforms of modern times, and is arguably responsible for reshaping the public school organizational structure into what it is today (Amis & Aïssaoui, 2013; Gershenson & Langbein,

2015). While history reveals that consolidating districts into larger districts was a common reform in an attempt to increase student achievement and reduce district expenditure, opposing research argues that consolidation does not lead to improved efficiencies and benefits for students, as often claimed (Bolkan, 2013; Duncombe & Yinger, 2010; Nguyen-Hoang & Yinger, 2014; Reingewertz, 2012; Howley et al., 2011; Schmidt & Schlottmann, 2007).

Combined, these two polarized sides, as well as discrepancies of ideal school district size, literature shows that even after decades of research, reformers and policymakers are unable to form a consensus on the effects of district size (Balcom, 2013; Chingos et al., 2013; Nguyen-Hoang & Yinger, 2014; Riha et al., 2013; Welsch & Zimmer, 2016;). Supporters of consolidation claim that larger schools enable the economies of scale to increase educational spending by lowering operational costs. (Flowers, 2010; Gershenson & Langbein, 2015; Parrish, 2015; Preston et al., 2013; Rogers et al., 2014; Riha et al., 2013; Weldon, 2012). Opponents of consolidation claim that the benefits seldom materialize, and that smaller districts increase relational aspects of schooling and subsequently provide a more conducive environment for the economies of scale to take place (Bolkan, 2013; Howley et al., 2011; Reingewertz, 2012; Riha et al., 2013; Schmidt & Schlottmann, 2007; Smithson, 2016).

Past researchers showed various opposing results in several different studies. Furthermore, several studies exist that encourage and discourage school district consolidation. Some researchers found an increase in student achievement, and some found a decrease in student achievement when school districts consolidated. Researchers showed a definite gap in concrete evidence with regard to the financial implications of school district consolidation, the effect of school district consolidation on student achievement, as well as the ideal school size in which students can perform optimally.

The results of this literary analysis reinforced the increasing realization that understanding how district size affects student achievement and district expenditure, as well as establishing the ideal district size for future consolidations and consolidation legislation, is much more complex than some previous research findings and professional opinions have led policymakers to believe. With continued support of district consolidation by policymakers as well as their focus on student learning and district expenditure, knowing which district size provides the ideal environment for efficiencies in both variables can provide the much-needed empirical evidence that the consolidation reform has been without. Therefore, the results of the current study will provide valuable insight for future consolidation practices, as well as insight for school administrators with regard to the variables affecting student achievement.

CHAPTER III: METHODOLOGY

Introduction

This quantitative study's purpose is premised on a better understanding of how the size of a district affects student acheivement and district expediture in order to determine what size district (or range of size) better fosters an environment conducive for high student achievement and low district expenditure.

The researcher addressed the following research questions in this quantitative study:

1. Is there empirical data to suggest a relationship between: a) student achievement and district size? b) district expenditure and district size?
2. Are there significant mean differences in student achievement across school districts based on district size? Are there significant means differences in district expenditure across school districts based on district size?

This chapter contains the discussion of the research design used. In addition, the researcher will discusses population, sample size, sampling procedure, the measurement used for the study and the operationalization of constructs, the data collection procedure, data analysis, and ethical procedures conducted in the study. The researcher concludes the chapter with a summary.

Research Design and Rationale

The researcher conducted a quantitative, correlational study. Quantitative research is defined as a type of study in which the objective is to explain a phenomenon by collecting numerical data that are analyzed using statistics (Pulido-Martos, Augusto-Landa, & Lopez-Zafra, 2012). A quantitative study is conducted if the goal of the study is to examine relationships among different numerically measured study variables (Babbie, 2012). Tools used in any

quantitative methodologies are quantitative measurement or instruments to measure data, and statistical analysis to quantitatively analyze the data to investigate the topic on hand (Mustafa, 2011). The current researcher collected numerical data in this study from existing data from a secondary source.

The specific quantitative research design used was a correlational research design. A correlational research design is conducted in a quantitative study in which the purpose is to examine relationships among different study variables, or to investigate the effect of independent variables on a particular dependent variable (Leedy & Omrod, 2010). The researcher used a correlational research design to examine the possible effect the enrollment size of a school district has on student achievement and district expenditure. Causality cannot be assumed in a correlation analysis. Correlational research design was an appropriate match, as this study did not involve any manipulation of variables or the use of a controlled experimental research setting. The researcher did not use an experimental research design in this quantitative study, as there were no interventions or treatment groups introduced in this study.

Population

The population of the study consisted of different school districts in the state of Illinois. This school district should have fostered a system of high student achievement coupled with effective district spending. The unit of analysis for this study was the 858 districts in the state of Illinois for the 2015-16 school year. In terms of district size, the researcher classified districts into four size categories: Rural (under 500 students), Exurban (500-1,499 students), Suburban (1,500-2,500 students), Urban (over 2,500 students). As the researcher calculated data for each school district size category, he compared it to the results of the other size categories to determine what differences and similarities exist.

Sample Size and Sampling Procedures

The researcher determined the required number of samples or sample size for this current quantitative study by conducting a power analysis. Power analysis is conducted through the computation software G*Power. The sample size computation is based on different factors. These include the Cohen's effect size, the level of significance, and the statistical power or the probability of rejecting a false null hypothesis. Investigators conduct an *a priori* power analysis with the following factors: (a) statistical test of multiple linear regression analysis with one predictor (independent variable of district size); (b) statistical power of 0.80, which is normally used in quantitative studies (Faul, Erdfelder, Lang, & Buchner, 2009); (c) medium effect size of 0.15 based on a regression analysis; and (d) level of significance value of 0.05, typically used in a quantitative study. This yielded a minimum sample size of 55 (see Appendix A). The results of the power analysis computed for the 55 samples indicated that there should be at least 55 data sets of the dependent and independent variables for this study from the samples of school districts in the state of Illinois collected to achieve the required statistical power for a quantitative study of 80%.

In this quantitative study, the researcher used a purposive sampling technique because it has certain advantages applicable for this study, including greater accessibility, faster speed, and lesser costs associated in recruiting or obtaining samples for the study (Coy, 2008). The researcher chose a purposive sampling technique for this quantitative study because participating units needed to meet a specific set of inclusion criteria to be eligible to be able to participate in the study (Yang & Banamah, 2014). The inclusion criteria of the study were only school districts in the state of Illinois for which complete achievement, expenditure, and enrollment size could be collected. As stated, the researcher obtained samples from a secondary data source.

Measurement and Operationalization of Constructs

The current researcher obtained data from a secondary source, specifically the Illinois State Board of Education (ISBE). The researcher utilized data provided by ISBE on every school district in the state of Illinois. State mandated achievement tests are administered statewide at multiple grades, and consequently provide the most consistent data for comparing student achievement uniformly across all districts. The database from ISBE included the data on the school district size (independent variable), student achievement (dependent variable), and district expenditure (dependent variable). Secondary data were existing data available in historical records, database, and documents (Andrews, Higgins, Andrews, & Lalor, 2012). As stated, the data of the study variables collected were during the 2015-16 school year. The researcher measured all of the data of the study variables continuously.

District Expenditure

District expenditure was a dependent variable. It was a continuously measured variable with the following computation: gross operating expenditure per pupil (OEPP) cost of a school district (excepting summer school, adult education, bond principal retired, and capital expenditures) divided by the 9-month average daily attendance (ADA) for the regular school term (ISBE, 2015).

District Size

District size was an independent variable. It was a continuously measured variable. It was the actual number of students enrolled in an entire school district according to the district's average daily attendance (ADA).

Student Achievement

Student achievement was a dependent variable. The researcher used the percentage of students passing achievement tests to measure student achievement. This was based on students' performance scores on the Illinois State Partnership for Assessment of Readiness for College and Careers (PARCC) achievement test.

Data Collection Procedures

The researcher requested the required data from the office of the Illinois State Board of Education (ISBE). They have the data on the district expenditure, district size, and student achievement on their databases and records. The researcher conducted a request for the data by e-mailing the database administrators, and sending a written request letter to the physical office in Springfield Illinois. The request letter included a written request to obtain the data, and the description of how the data would be used. The researcher also included the purpose of the study in the request letter. The researcher submitted the request letter by mail delivery and through e-mail. The researcher requested data of the entire 858 districts in the state of Illinois for the 2015-16 school year. Once the ISBE granted the request, the researcher commenced data collection. The researcher inputted specific data collected from the database into an Excel spreadsheet format that uploaded to the statistical assessment software of SPSS, where he conducted the statistical analysis.

Data Analysis Plan

Test of Assumptions

The researcher analyzed the quantitative data using linear regression analysis to determine what, if any affect the independent variable of enrollment size of a school district had on the dependent variables of student achievement and district expenditure. Prior to the linear

regression analysis, the researcher conducted normality testing on the data of the different study variables. It was a requirement of a parametric statistical test that the data should exhibit normal distribution. A regression analysis is considered a parametric statistical test. The researcher conducted an investigation of the normality distribution by examining the skewness and kurtosis statistics, and also the investigation of the normality plots in the histograms. Also, the researcher generated scatter plots of the data of the study variable to investigate the presence of outliers in the data set. Outliers were removed in the data set prior to the actual statistical analysis, as it has a negative effect on the results of the statistical analysis.

Descriptive Statistics

Because all of the study variables were continuously measured, the researcher used descriptive statistics as the central tendency measures of mean, and obtained standard deviation to summarize the data of the study variables. The study variables included the independent variable of enrollment size of a school district and the dependent variables of student achievement and district expenditure.

Inferential Statistics

To address the first research question for this quantitative study, the researcher conducted a linear regression analysis to determine the effect of the independent variable of enrollment size of a school district on the dependent variables of student achievement and district expenditure. The researcher analyzed the effect of the independent variable of enrollment size on the different dependent variables in separate regression models; he created two regressions for this study.

The researcher used a level of significance value of 0.05 in the two-regression model that he created to determine whether the independent variable significantly affected the dependent variables. The independent variable significantly affected the dependent variable if the *p*-value of

the *t*-statistics to test the individual affect of an independent variable to the dependent variable was less than or equal to the level of significance value. This would mean that the independent variable had a significant affect on the dependent variable.

The researcher knew the magnitude of the affect of the significant independent variable to the dependent variable through the analysis of the beta coefficient. A positive beta coefficient would indicate a positive effect, which means that value of the dependent variable would increase if the value of the independent variable increased. A negative beta coefficient would indicate a negative affect, which means that the value of the dependent variable would decrease if the value of the independent variable increased.

To address research question two, the researcher conducted a test of difference to determine the differences among districts in their size in relation to student achievement and district expenditure. Specifically, the researcher conducted an Analysis of Variance (ANOVA) with student achievement and district expenditure as the dependent variables, and district size as the independent variable. The independent variable of district size was a categorical variable, in this case with four size categories which included Rural (under 500 students), Exurban (500-1,499 students), Suburban (1,500-2,500 students), and Urban (over 2,500 students). The researcher used a level of significance of 0.05 in the ANOVA. The researcher considered student achievement and district expenditure significantly different across the different groupings of district size to affect the dependent variable if the *p*-value of the *F*-statistics was less than or equal to the level of significance value. Then, he conducted a post-hoc test to further examine the significant differences.

Ethical Procedures

Human subjects were not involved in this study. The unit of analysis was the school districts. The data did not require any anonymity or confidentiality assurance, as the data available were public information and did not have any sensitive information that should be kept anonymous. The identification information was the names of the school districts, which was not sensitive information. As such, all measures that ensure the protection of human subjects engaged in research were not needed. However, if needed, the data collection procedures designed for this study were first reviewed by the university's Institutional Review Board (IRB) to guarantee that the data collection procedure was ethically and legally acceptable and did not violate human rights.

The researcher requested permission from the office of Illinois State Board of Education (ISBE) for the data, and obtained a letter of cooperation. A letter of cooperation states that the organization agrees to allow sharing of the data and using the data for this quantitative study. The researcher submitted the letters of cooperation with the IRB application and would have included said letter in the IRB approval process if necessary.

The researcher stored electronic copies of the complete set of data in a digital media storage and on his personal computer, and stored printed copies in a locked filing cabinet at his personal residence. Storage of printed copies will last up to 3 years after the conclusion of the study. The electronic files were to be permanently deleted 3 years after the conclusion of the study. Paper copies of the data were to be paper shredded 3 years after the conclusion of the study. Only the researcher will be able to access any data.

Summary

In this chapter, the current researcher has included the discussion of the study's research design, population, sample size and sampling procedures, instrumentation and operationalization of constructs, data collection procedure, data analysis, and ethical procedures. The sample of the study included different school districts in the state of Illinois that foster a system of high student achievement coupled with efficient district spending. This quantitative study used a correlational research design using linear regression analysis and ANOVA test of difference to address the research questions of the study. The purpose of this quantitative correlational study was to determine what, if any, affect of enrollment size of a school district has on the student achievement and district expenditure. The researcher used secondary data to obtain the data of the study variables. The succeeding chapter will be the discussion of the results of the analysis to address the research questions of the study.

CHAPTER IV: RESULTS AND ANALYSIS

Introduction

The purpose of this quantitative study using a correlational research design was to explore the effect of district size on student achievement and district expenditure. Specifically, the study aimed to understand how the size of a district affects student achievement and district expenditure in order to determine what size district (or range of sizes) better fosters an environment conducive for high student achievement and low district expenditure. In this section of the study, the researcher presents descriptive data, data analysis using linear regression analysis, and ANOVA. The study variables included the independent variable of enrollment size of a school district, and the dependent variables of student achievement and district expenditure. The researcher utilized IBM SPSS Statistics (SPSS) Version 22 to conduct the data analysis, and G*Power to conduct the power analysis. The following research questions and hypotheses guided this project:

1. Is there empirical data to suggest a relationship between: a) student achievement and district size? b) district expenditure and district size?
2. Are there significant mean differences in student achievement across school districts based on district size? Are there significant means differences in district expenditure across school districts based on district size?

Descriptive Statistics Summaries of Study Variables

The original samples consisted of 858 samples of school districts in the state of Illinois. However, upon removing outliers, as well as districts for which complete data was not available, the final number of samples was 814 school districts in the state of Illinois. The researcher conducted post-hoc power analysis to determine whether the final sample size of 814 was more

than enough to achieve statistical power in the statistical analysis. Typically, an 80% power is required in quantitative studies. Post-hoc power analysis for a regression analysis involving a two-tailed test, medium effect size (0.15), level of significance of 0.05, one number of predictor or independent variable, and the total sample size resulted to a power of 1.00 or 100% (see Figure 1). Also, post-hoc power analysis for an ANOVA involving medium effect size (0.25), level of significance of 0.05, four groups of numbers for the independent variable of district size, and the total sample size also resulted in a power of 1.00, or 100%. Thus, the use of 814 as the final sample size resulted to a statistical power greater than the 80% minimum for a quantitative study. Therefore, the final sample size was more than adequate.

Summaries of the scores of study variables are presented in Tables 1 and 2. The researcher measured school district size by the average daily attendance (ADA). The majority of the samples of school districts were Rural (255; 31.3%) or Exurban (322; 39.6%). The mean district size was 1,402.31 (SD = 1,526.43). The highest school district size among the 814 school district samples was 8,800.11, and the lowest was 47.07. For student achievement of the school districts, the mean student achievement, as measured by the student's performance scores on the Illinois State Partnership for Assessment of Readiness for College and Careers (PARCC) achievement test, was 32.16 (SD = 15.29). The highest student achievement among the 814 school district samples was 83.10, and the lowest was 0. For district expenditures of the school districts, the mean district expenditure was 21.85 (SD = 26.49). The highest district expenditure among the 814 school district samples was 178.69, and the lowest was 1.07.

Table 1

Frequency and Percentage Summaries of District Size

	Frequency	Percent
Rural	255	31.3
Exurban	322	39.6
Suburban	102	12.5
Urban	135	16.6

Table 2

Descriptive Statistics Summaries of Study Variables

	N	Minimum	Maximum	Mean	Std. Deviation
Student Achievement (PARCC)	814	0.00	83.10	32.16	15.29
District Size (ADA)	814	47.07	8800.11	1402.31	1526.43
District Expenditure*	814	1.07	178.69	21.85	26.49

*Divided by 1,000

Normality Testing

A required assumption of parametric statistical test is normality. Normality of the data is a required assumption for parametric statistical tests, such as regression analysis and ANOVA. The researcher conducted normality testing by examining the skewness and kurtosis statistics and histograms. Table 3 summarizes the skewness and kurtosis statistics for the data of the study variables of student achievement, district size, and district expenditure. To determine whether the data follows normal distribution, skewness statistics greater than three indicated strong non-normality, and kurtosis statistics between 10 and 20 also indicated non-normality (Kline, 2005). As can be seen in Table 3, all the skewness statistics for the study variables of 0.55 to 2.87 were not greater than 3. The kurtosis statistics for the study variables of 0.42 to 9.99 were not in the

range of 10 to 20. Also, histograms in Figures 3 to 5 show that the graphs for student achievement, district size, and district expenditure all formed a bell-shaped curved pattern, although not perfect, representing a normal distribution curve. With these results, the data for each of the study variables of student achievement, district size, and district expenditure exhibited a normality distribution assumption. Thus, the researcher could conduct the different parametric tests to address the research objectives of the study.

Table 3

Skewness and Kurtosis of Study Variables

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Student Achievement (PARCC)	814	0.55	0.09	0.42	0.17
District Size (ADA)	814	2.06	0.09	4.39	0.17
District Expenditure	814	2.87	0.09	9.99	0.17

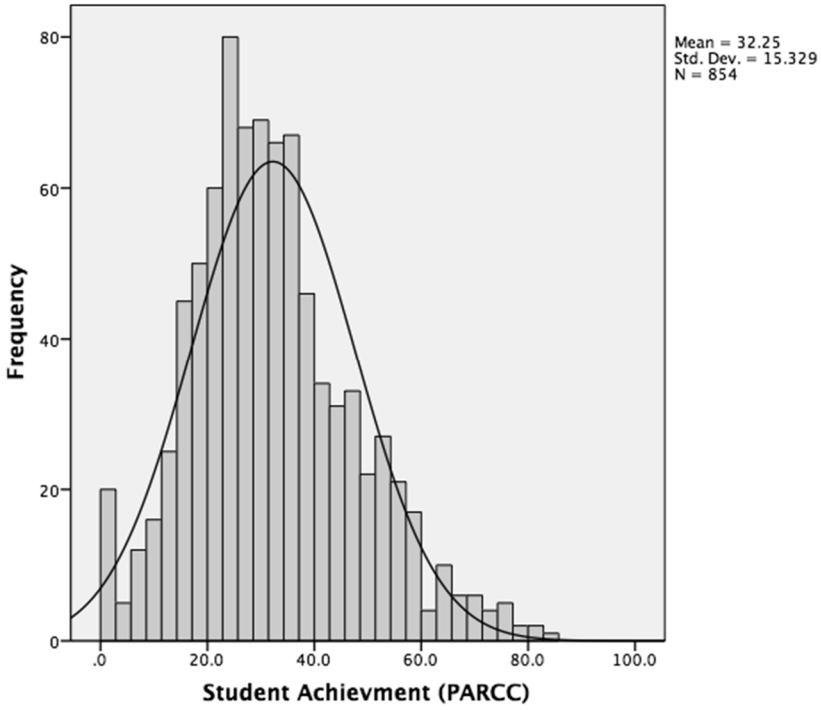

Figure 3. Histogram of student achievement.

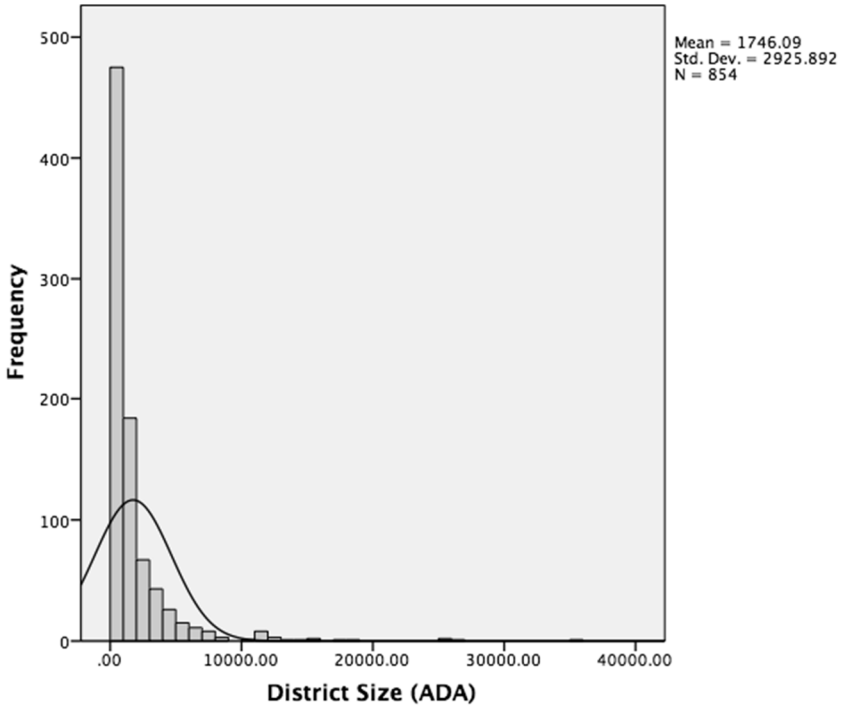

Figure 4. Histogram of district size.

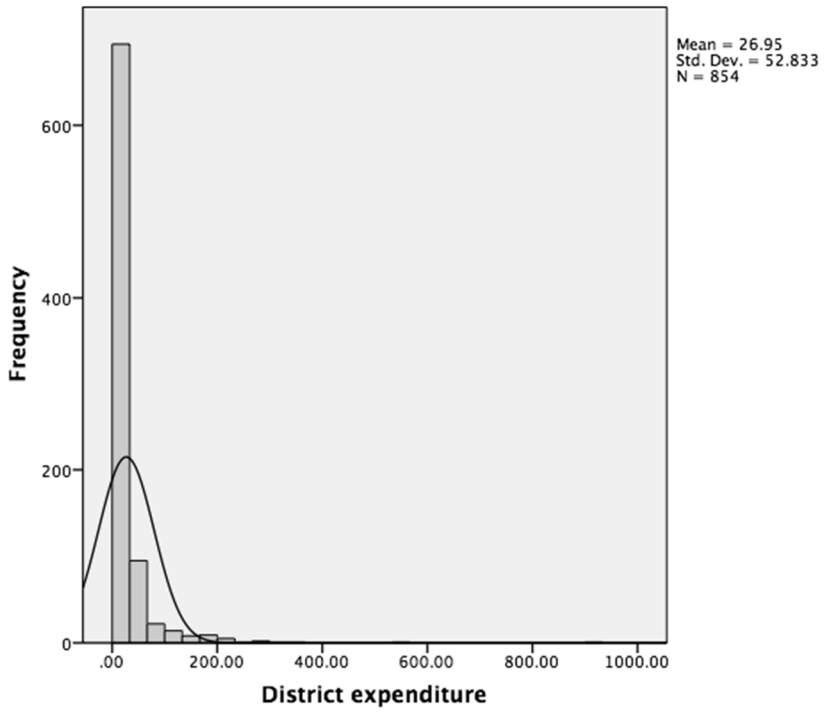

Figure 5. Histogram of district expenditure.

Outlier Investigation

The researcher generated a scatterplot to detect outliers in the data of the study variables in this research study. The scatterplots of the different study variables of student achievement, district size, and district expenditure are presented in Figures 6 to 8. The scatterplots of the different study variables showed that there were no outliers in the data set. In the range of possible scores, there were no data points that were abnormal. In addition, randomness of the data of the study variables of student achievement, district size, and district expenditure can be observed in the following three scatterplots. With the exception of the precluded outlier district CPS, there were no other outliers in the data set.

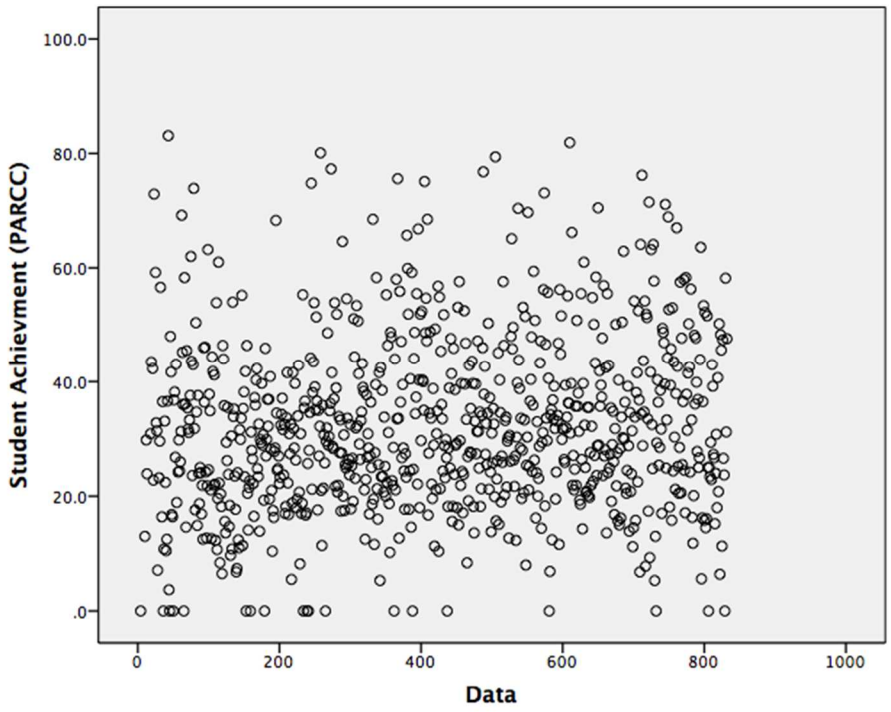

Figure 6. Scatter plots of student achievement.

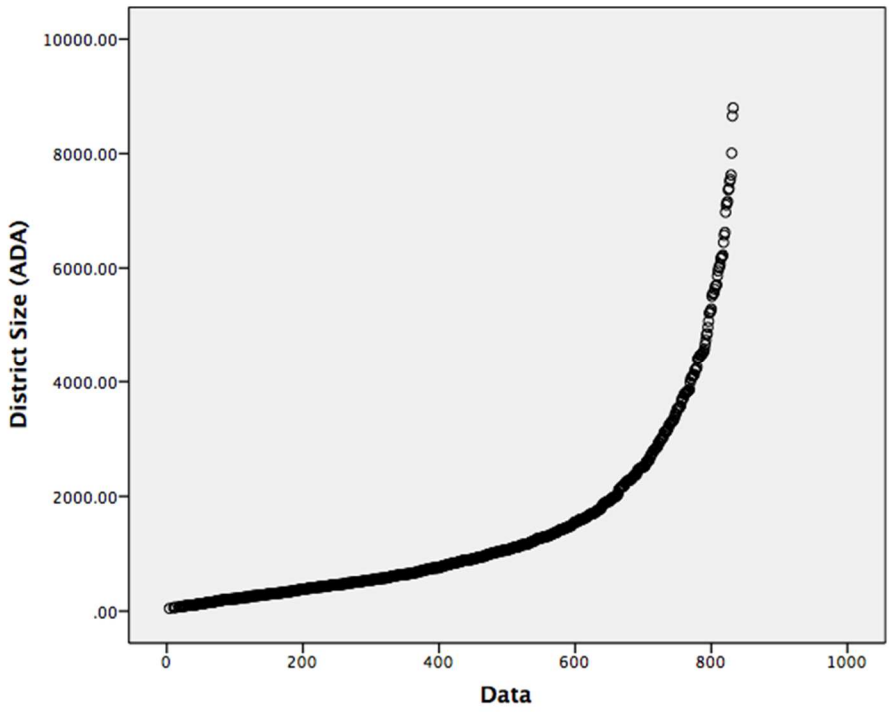

Figure 7. Scatter plots of district size.

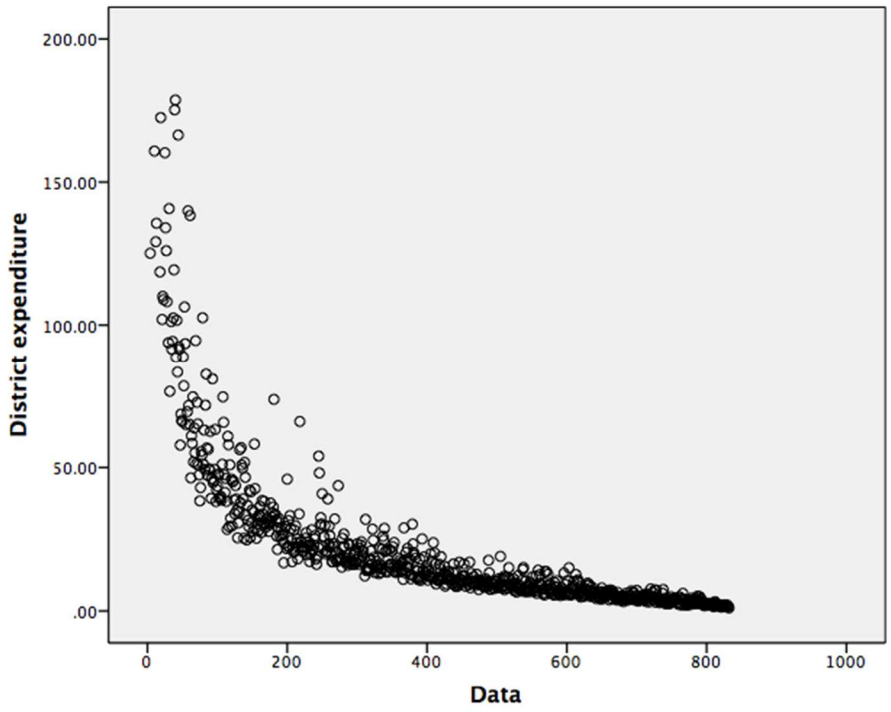

Figure 8. Scatter plots of district expenditure.

Regression Results for Research Question One

The researcher conducted a regression analysis to address research question one, to determine if district size affects student achievement and district expenditure. This analysis determined if there was a specific size or a range of size of a district that enhances student achievement when related to district expenditure. The researcher used a level of significance of 0.05 in the regression analysis. There was a significant relationship if the *p*-value was less than or equal to the level of significance value.

When addressing the concept of the achieving the ideal school district size, based on student achievement and district expenditure, the regression analyses provided empirical evidence that positive effects on student achievement and district expenditure of larger school districts were evident. In the scope of creating a more efficient and effective public education system, one could argue that bigger is in fact better. When addressing the need to consolidate

based on the need of producing more cost-effective districts while not sacrificing academic delivery and services, consolidating smaller districts into larger ones does hold potential benefits.

Table 4 shows the regression results to determine the effect of district size on student achievement. The regression result showed that the model fit of the regression model ($F(1, 812) = 3.16$, $p = 0.08$) was insignificant, indicating that the regression model did not have an acceptable model fit. The r square value of the regression model was 0.004, which indicated a very low effect size. The effect size of the independent variable of district size on student achievement was very low, and only captured 0.4% of the variance in the regression model. Investigation of the individual effect showed that district size ($t(811) = 1.78$, $p = 0.08$) did not have a significant effect or predictive relationship with student achievement.

Table 4

Regression Results of Effect of District Size on Student Achievement

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	*p*
		B	Std. Error	Beta		
1	(Constant)	31.23	0.73		43.04	<0.01*
	District Size (ADA)	0.001	0.00	.062	1.78	0.08*

Note. $F(1, 812) = 3.16$, $p = 0.08$, R Square (R2) = 0.004, $N = 813$

a. Dependent Variable: Student Achievement (PARCC)

b. Predictors: (Constant), District Size (ADA)

*Significant at level of significance of 0.05

The results of this regression analysis showed that district size did not have a significant effect on student achievement, and therefore the claims that smaller districts produce higher student achievement were incorrect when compared to other size districts. Other variables aside, (relationships, attendance, involvement) when determining if a certain sizes of districts produce

higher academic success, the 2015-16 PARCC results showed that there was no evidence to support this claim. Without evidence to support such claims, the argument that one size over the other are better suited to reach the academic student success is misleading.

Table 5 shows the regression results to determine the effect of district size on district expenditure. The regression result showed that the model fit of the regression model ($F(1, 812) = 238.67$, $p = 0.08$) was insignificant, indicating that the regression model did not have an acceptable model fit. The r square value of the regression model was 0.23, which indicated a moderate effect size. The effect size of the independent variable of district size on district expenditure was moderate, and captured 23% of the variance in the regression model. Investigation of the individual effect showed that a district size ($t(811) = -15.45$, $p < 0.001$) had a significant effect or predictive relationship with district expenditure. Investigation of the unstandardized beta coefficient value showed that district size (-0.01) had a negative effect and predictive relationship on district expenditure. This meant that a larger district size of the school district would result to lesser district expenditure. A one score increase in district size would result to a 0.01 decrease in district expenditure in the school district. There was empirical data to suggest that there was a specific size or a range of size of a district that enhanced district expenditure. The regression equation can be written as $Y_{\text{District expenditure}} = 33.45 - 0.01X_{\text{District Size}}$

Table 5

Regression Results of Effect of District Size on District Expenditure

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	*p*
		B	Std. Error	Beta		
1	(Constant)	33.45	1.11		30.14	<0.01*
	District Size (ADA)	-0.01	0.001	-0.48	-15.45	<0.01*

Note. $F(1, 812) = 238.67$, $p < 0.001$, R Square (R2) = 0.23, $N = 813$

a. Dependent Variable: District expenditure

b. Predictors: (Constant), District Size (ADA)

*Significant at level of significance of 0.05

The analysis supported the claim that larger school districts are more cost effective in terms of lowering total operating expenditure per pupil when compared to their smaller counterparts. These results would lead one to believe that larger school districts do hold benefit to saving taxpayers money through a means of servicing more students for less money. With this claim being one of the most prevalent in the pro-consolidation movement, these results serve as empirical evidence that school district economies of scale do exist.

ANOVA Results for Research Question Two

The researcher conducted an ANOVA test to address research question two to determine whether there were differences among districts in their size in relation to student achievement and district expenditure that were large enough to be relevant. The researcher used a level of significance of 0.05 in the ANOVA. There was a significant difference if the *p*-value was less than or equal to the level of significance value.

The ANOVA results in Table 7 showed that the student achievement ($F(3,810) = 5.28$, $p < 0.001$) and district expenditure ($F(3, 810) = 257.49$, $p < 0.001$) were significantly different across differences in school district size. This meant that differences among districts in their size resulted in differences in the student achievement and district expenditure of the school districts. Post-hoc test results in Table 8 showed that school districts in the rural category had significantly lesser student achievement than those school districts in the exurban category (Mean difference = -3.99, $p = 0.01$), suburban (Mean difference = -4.62, $p = 0.05$), and urban (Mean difference = -5.39, $p = 0.01$). Mean comparison in Table 6 showed that school districts in the urban category ($M = 34.50$; SD = 15.29) had the highest student achievement while school districts in the rural

category (M = 29.11; SD = 15.54) had the lowest student achievement. Without controlling for other variables such as social-economic status and specific educational spending, this analysis showed that school districts with bigger district size had greater student achievement.

Also, Post-hoc test results in Table 8 showed that school districts in the rural category had significantly greater district expenditure than those in the exurban category (Mean difference = 35.55, $p < 0.001$), suburban (Mean difference = 42.46, $p < 0.001$), and urban (Mean difference = 45.26, $p < 0.001$). School districts in the exurban category had significantly greater district expenditure than those in the suburban category (Mean difference = 6.96, $p = 0.01$) and urban (Mean difference = 9.76, $p < 0.001$). Mean comparison in Table 6 showed that the rural category (M = 48.71; SD = 33.35) has the highest district expenditure, while the urban category (M = 3.46; SD = 1.42) had the lowest district expenditure. This analysis showed that school districts with bigger district size had lesser district expenditure.

Table 6

Descriptive Statistics of Student Achievement and District Expenditure by District Size

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Student Achievement (PARCC)	Rural	255	29.11	15.54	0.97	27.19	31.03	0.00	83.10
	Exurban	322	33.10	14.59	0.81	31.50	34.70	0.00	79.40
	Suburban	102	33.73	13.62	1.35	31.05	36.40	13.60	81.90
	Urban	135	34.50	16.84	1.45	31.63	37.37	0.00	76.20
	Total	814	32.16	15.29	0.54	31.11	33.21	0.00	83.10
District Expenditure	Rural	255	48.71	33.35	2.09	44.60	52.83	16.26	178.69
	Exurban	322	13.21	5.23	0.29	12.64	13.79	5.36	31.92
	Suburban	102	6.25	2.11	0.21	5.84	6.67	3.27	15.06
	Urban	135	3.46	1.42	0.12	3.21	3.70	1.07	7.66
	Total	814	21.85	26.49	0.93	20.02	23.67	1.07	178.69

Table 7

ANOVA Results of Differences of Student Achievement and District Expenditure by District Size

		Sum of Squares	df	Mean Square	F	*p*
Student Achievement (PARCC)	Between Groups	3647.76	3	1215.92	5.28	<0.01*
	Within Groups	186397.26	810	230.12		
	Total	190045.03	813			
District Expenditure	Between Groups	278534.27	3	92844.76	257.49	<0.01*
	Within Groups	292070.77	810	360.58		
	Total	570605.04	813			

*Significant at level of significance of 0.05

Table 8

Post-Hoc Test Results of Differences of Student Achievement and District Expenditure by District Size

Dependent Variable	(I) District Size	(J) District Size	Mean Difference (I-J)	Std. Error	*p*	95% Confidence Interval	
						Lower Bound	Upper Bound
Student Achievement (PARCC)	Rural	2.00 Exurban	-3.99*	1.27	0.01	-7.27	-0.72
		3.00 Suburban	-4.62*	1.78	0.05	-9.19	-0.04
		4.00 Urban	-5.39*	1.61	0.01	-9.55	-1.23
	Exurban	3.00 Suburban	-0.63	1.72	0.98	-5.06	3.81
		4.00 Urban	-1.40	1.56	0.81	-5.40	2.61
	Suburban	4.00 Urban	-0.77	1.99	0.98	-5.89	4.35
District Expenditure	Rural	2.00 Exurban	35.50*	1.59	<0.01	31.40	39.60
		3.00 Suburban	42.46*	2.22	<0.01	36.73	48.19
		4.00 Urban	45.26*	2.02	<0.01	40.06	50.46
	Exurban	3.00 Suburban	6.96*	2.16	0.01	1.41	12.51
		4.00 Urban	9.76*	1.95	<0.01	4.75	14.77
	Suburban	4.00 Urban	2.80	2.49	0.68	-3.61	9.21

* The mean difference is significant at the 0.05 level.

Summary

The purpose of this quantitative study using a correlational research design was to explore the affect of district size on student achievement and district expenditure. In this chapter, the researcher presented the results and analysis of the statistical analysis to address the two research questions of the study. Results of the regression analysis showed that district size did not have a significant effect on student achievement, while district size had a significant negative effect on district expenditure. Results of the ANOVA showed that student achievement and district expenditure were significantly different across differences in school district size. School districts with bigger district size had greater student achievement. School districts with bigger district size had lesser district expenditure. These results serve as empirical evidence that school district economies of scale do exist in terms of student achievement and district expenditure, and that an ideal school district size can be realized.

The results conclude that the claims of smaller districts being more efficient as well as effective in terms of student achievement and district expenditure are misleading. Even more so, through evaluation of the descending order of means, one can conclude that when it comes to the academic achievement and district expenditure, smaller districts not only produce outcomes of less achievement than their larger counterparts, but also require more expenditure to do so. Based on this analysis, one can claim that larger district are more cost effective as well as better suited to reach optimal levels of efficiency when it comes to student achievement and district expenditure. These findings produce empirical evidence that the consolidation of school districts is viable when electing to increase student achievement and decrease district expenditure. In the next chapter, Chapter 5, the researcher includes further discussion of the results presented in this chapter. The researcher will review each of the results in each of the two research questions

investigated, and will discuss the potential implications for each of the results of the analysis in the succeeding chapter.

CHAPTER V: DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

Introduction

This chapter contains a summary of the research and the implications of the research findings, as well as a description of the limitations of the research and recommendations for future research. The researcher will associate the implications and conclusions of the study to the existing research in the field.

The purpose of this quantitative dissertation was to investigate how the size of a district affects student achievement and district expenditure in order to determine what size district (or range of sizes) better fosters an environment conducive for high student achievement and low district expenditure. Although many politicians, administrators, and researchers believe that larger district size brings about better economies of scale and student achievement, there is contradicting research and little consensus on this issue (Andrews et al., 2002; Balcom, 2013, Berry, 2006; Berry & West, 2008; Boser, 2013; Duncombe & Yinger, 2010; Gordon & Knight, 2008). The studies present findings that are very broad and unspecific, and include ranges of size that very few districts currently fall under, providing little guidance to future consolidations and consolidation legislation. The current researcher undertook this study to determine if the enrollment size of a school district has any impact on student achievement, in order to add to the socio-economy as well as the educational body of literature. More specifically, the aim was to determine an ideal district size or range of sizes that could be used as a guideline for consolidation of school districts.

Major Findings of the Study

Since the 1930s, there was an ongoing process to consolidate smaller districts form larger ones in an attempt to use available funds more appropriately to benefit both the students and the state. This study focused on the school districts in the state of Illinois, using 814 samples of school districts to conduct this study, which was more than enough to achieve enough statistical power in the statistical analysis.

District consolidation represents a powerful and impactful educational reform in public school systems of the United States (Adams & Foster, 2002; Berry, 2006; Boser, 2103; Duncombe et al., 2005; Duncombe & Yinger, 2010; Howley et al., 2011). When comparing to the structures of the public education system over the past century, policymakers have consolidated close to 90% of districts in an effort to make the business of education more efficient and effective (Amis & Aïssaoui, 2013; Duncombe & Yinger, 2010; Reingewertz, 2012; Stevenson, 2006). Over the last century, the number of districts has decreased, even as the number of enrolled students has increased, causing the average district enrollment to increase from 187 in 1937 to 3,600 in 2014 (Cooley & Floyd, 2013; NCES, 2015).

The purpose of this study was to find if an ideal district size, or range of sizes, exists in terms of proving an environment conducive for high student achievement and low district expenditure. Based on their size and geographical location, the researcher divided districts within the state of Illinois into Rural (less than 500 students), Exurban (500-1,499 students), Suburban (1,500-2,500 students), and Urban (more than 2,500 students). The researcher will discuss the results in terms of the research questions, which were:

1. Is there empirical data to suggest a relationship between: a) student achievement and district size? b) district expenditure and district size?

2. Are there significant mean differences in student achievement across school districts based on district size? Are there significant means differences in district expenditure across school districts based on district size?

Research Question One

This question asked if the district size affected student achievement and district expenditure. The results showed the independent variable—district size—had a low effect on student achievement (0.4% of the variance in the regression model). Therefore, there was not a significant effect of the district size on student achievement, and not a predictive relationship with student achievement, meaning that the district size cannot be used to predict student achievement.

The second part of research question one necessitated finding a possible relationship between district size, student achievement, and expenditure. The results of the regression model indicated that there was a moderate effect size of the independent variable—district size—on district expenditure (23% of the variance in the regression model). The findings of the individual effect showed that the bigger the size of the district, the less the district expenditure, or that larger districts spend less money. Even if the district size increased with 0.01, there would be an associated decrease in expenditure.

In sum, for research question one, the researcher found that the size of the district does not have a significant effect on student achievement. The size of the district does, however, have a significant effect on the expenditure of a district as the larger the district is the smaller the expenditure.

Research Question Two

To establish if there were large enough differences among districts in relation to their

size, student achievement, and expenditure to be relevant, the researcher conducted an ANOVA test (using a 0.05 level of significance). The researcher found both student achievement ($F(3,810) = 5.28$, $p < 0.001$) and district expenditure ($F(3, 810) = 257.49$, $p < 0.001$) to be significantly different across the different district sizes. Therefore, the size of the school districts gave rise to differences in student achievement and district expenditure. The findings showed that rural districts had significantly poorer student achievement compared to the exurban, suburban and urban district sizes. The comparison indicated that urban district size was associated with the highest achievement (M = 34.50; SD = 15.29) and the rural district size had the lowest student achievement (M = 29.11; SD = 15.54). Thus, based on the mean comparison results of this study bigger district size is associated with better school achievement of the students.

Pertaining to the different district sizes and expenditure, the results indicated that the rural district size had significantly greater district expenditure compared to the exurban, suburban, and urban district sizes respectively. The district size with the highest expenditure was rural district size (M = 48.71; SD = 33.35) and the district size with the lowest expenditure was urban (M = 3.46; SD = 1.42). Therefore there was a chiastic relationship between district size and expenditure—the bigger the district size the less the district expenditure will be.

Interpretation of the Findings

The findings for research question one confirm the consolidation trend in public education as consolidation of districts is done to make education more efficient and effective in terms of obtaining a comparative level of student achievement for less expenditure (Amis & Aïssaoui, 2013; Duncombe & Yinger, 2010; Reingewertz, 2012; Stevenson, 2006). In terms of the ecological systems theory, this investigation only focused on the effect of district size on

expenditure and student achievement, as it was expected that students may be influenced by the size and capital expenditure of the district where their school falls under (Neal & Neal, 2013). Whereas the results of this study did not show as strong of a relationship between the size of the district and student achievement as could be expected (Flowers, 2010; Gershenson & Langbein, 2015), it did show a significant relationship between district size and expenditure (Amis & Aïssaoui, 2013; Gershenson & Langbein, 2015). In keeping with the ideas that stemmed from the Industrial Revolution, Preston et al. (2013) found that larger districts spent less compared to smaller districts. The findings of this study may be used to bring more of a consensus between the pro-consolidation and anti-consolidation debate (Bickel & Howley, 2000; Boser, 2013; Chingos et al., 2013; Cooley & Floyd, 2013; Howley et al., 2011; NASBE, 2003; Parrish, 2015; Schmidt & Schlottmann, 2007).

The researcher confirmed the argument that increased student enrollment would result in lower costs per pupil, and that the savings could be used to improve the quality of education (Heiney, 2014; Preston et al., 2013; Riha et al., 2013) by the ANOVA test for question two. When assessing education in business terms, increased production reduces duplicated services, resulting in an educational system that is fiscally more efficient; thus consolidation of smaller districts into larger districts should bring about financial savings and higher efficacy. The results for question two confirmed this argument (Howley et al., 2011; Nguyen-Hoang & Yinger, 2014; Preston et al., 2013, Riha et al., 2013). The ANOVA results supported educational reform through consolidation of districts by providing statistical results that showed larger sized districts both spend less money per student, and the overall student achievement was better (Banicki & Murphy, 2014; Heiney, 2014), and that higher expenditure on actual classroom or educational activities benefitted the students (Cullen et al., 2015).

The results of this study therefore do not seem to support Flaherty's (2013) findings, who stated that increased academic performance was related to higher expenditures on classroom instruction. In the current study, the researcher did not explore the allocation of funds, only how much expenditure there was per district, thus it was not possible to determine whether this study contradicts Flaherty's (2013) findings or not. Flaherty covered a wider range of school districts compared to the current study, covering 500 districts across the United States and using a longitudinal design, as it ran from 2000/1 until 2008/9. The differences in population and time span may explain the seeming differences in findings. However, the empirical data of the current study supported the pro-consolidation argumentation, making consolidation a viable option to increase the efficiency of districts both in terms of expenditure and student achievement by increasing the size of operation, and allowing the economies of scale to improve the relationship of district expenditure with that of student achievement (Flaherty, 2013; Flowers, 2010; Gershenson & Langbein, 2015; Howley et al., 2011; Preston et al., 2013; Riha et al., 2013).

Implications of the Findings

An anti-consolidation researcher, Hayek (2013), alluded that consolidation might be beneficial for decreasing expenditures of certain school districts, but it might not be beneficial towards student achievement. The empirical data from the current study did not support this argument of Hayek, as the ANOVA results of this study indicated gains in student achievement linked to lower expenditure in the urban district size. This positive support for consolidation may be of particular interest to policymakers who are advocating consolidation, as it strengthens their argument that both financial and student achievement gains could be made through consolidation of smaller districts.

Decreasing enrollment numbers, in especially rural districts, may lead to unnecessary high expenditure due to duplication of services, and consolidation of districts may seem to be a viable option (Haagenson, 2015). A decrease in enrollment brings with it a decrease in staffing, programs, and services offered to the students, which in turn may have a negative impact on student performance (Haagenson, 2015). Boser (2013) advised that there is a definite need for states and districts to affect changes in school management systems that would allow sharing of services to cut costs in smaller districts. Whereas Cooley and Floyd (2004) and Duncombe et al. (2014) found that district consolidation in the state of Texas yielded statistically significant increases in district expenditure and decreases in student achievement, the current researcher found the opposite. The differences in the findings could be due to the different focus of Duncombe et al., as they focused on the effect of district consolidation on property prices. The findings of the current study supported consolidation as it indicated that larger districts, especially of the urban size, lead to decreased expenditure and improved student achievement. Policymakers and district administrators can use the findings of this study to strengthen their support for consolidation of smaller districts where there may be resistance to change (Preston et al., 2013).

Although the current researcher used data from the state of Illinois only, the district sample of 814 was well representative. Furthermore, the researcher obtained student assessment data from state assessments and not only teacher designed assessments, as the latter could provide differences in achievement and assessment. The researcher used 2015-2016 data for this study, making the results relevant for the current economic and social environment. In keeping with the ecologic systems theory, the current environment impacts the students' achievement as

well as the expenditure at the district level. It is therefore deemed possible to generalize the results of this study to other states in the United States.

Overall, the results of this study lend support to the findings of other researchers who endorse consolidation as educational reform. Whereas some may argue that the long-standing consolidation movement is fueled only by the need to save on educational funding (Miller, 2013) the findings of this study are in support of consolidation based on the positive gains in both expenditure savings and increased student achievement. The Illinois State Board of Education (ISBE) can implement the findings of this study by means of district reorganization to improve student achievement and decrease education expenditure. As the results of this study were statistically significant, other education departments may also utilize it for educational reorganization. As highlighted earlier, there are other factors in play when examining the link between district size, student achievement, and expenditure. Ecological factors of any situation, including education, are complex, and therefore changes should be made with caution, as the current researcher did not set out to prove causality, but rather to determine links between the variables.

Limitations & Delimitations of the Study

The main limitation was that the researcher only included the state of Illinois as the data set, as it is considered an exemplar state due to its high number of districts, as well as having a higher comparable percentage of districts entrenched in the consolidation debate (Dabrowski & Klingner, 2016), and its highly active legislation on consolidation (NEA, 2014). This makes Illinois a leading state in consolidation enhancements (ISBE, 2016; NEA, 2014). The generalizability of the study findings may be limited to the state of Illinois only, or states with similar distribution of rural and urban districts.

Another limitation was that the district sizes—rural, exurban, suburban, and urban—were only based on the number of pupils, and did not take the geographical features into consideration. It can be argued that there are many other influences in the urban school regions that could explain the increased student achievement apart from expenditure. However, this and other relationships or possible causality were not the aim of this study.

The delimitations of this study included exemptions of potential data sources. This study used school district data from the state of Illinois, but not the City of Chicago School District (CPS) due to its size that would have skewed the data (ISBE, 2015). For example, the district average student enrollment was 3,690 at the time of the current study when CPS was not included; with CPS that number was 4,700. Including CPS in the data for this study would have altered the data by 22% (ISBE, 2015).

Another delimitation is that the current researcher only used the results from a one-year only post-hoc assessment data (2015-16). This delimitation of data collection may not be representative of the educational expenditure or students' achievement over a longer period. Doing so causes an increased chance that the data used is less reliable in terms of measuring student achievement.

Lastly, there are many factors in education that could arguably be just as important that the current researcher did not measure nor control for. The researcher intentionally did not evaluate variables such as SES, graduation rate, or even college readiness, for this study, as these would take away from the focus of this study, which was how district size effects student achievement and district expenditure.

Recommendations for Future Research

Future researchers may choose to duplicate this study in other states to determine the generalizability of the results. Researchers may take some of the ecological factors into consideration when replicating this study to determine whether increased student achievement could be linked with, for example, more internet access in the urban-sized districts compared to rural districts. Similarly, future researchers could use the percentage expenditure on educational programs as a variable to determine whether that could be linked with increased student achievement as researchers such as Flaherty (2013) found. Lastly, researchers may choose to study the possible links between district size, expenditure, and student achievement over a longer period of time.

Summary and Conclusions

In this quantitative relational study, the current researcher set out to determine whether there was a link between school district size, expenditure, and student achievement. More specifically, his aim was to determine an ideal district size or range of sizes that could be used as a guideline for consolidation of school districts. Much discussion for and against consolidation can be found in the literature, and no consensus could be reached to date, as this is a multi-tiered problem and there are many factors at play when dealing with the educational environment. As such, the researcher did not formulate a specific expectation for the outcomes of this study due to the controversy that exists in research literature.

The researcher used the state of Illinois to draw a data set from and 814 districts divided according to size for this study. Chicago Public Schools 299 (CPS) was one of 44 districts removed from the dataset due to containing outlying properties (the original sample was 858). Adding CPS (and other outlying districts) would have caused the statistical significance to

be compromised. For example, the district average student enrollment at the time of this study was 3,690 when CPS was not included; with CPS that number is 4,700. Including CPS in the data for this study would have altered the data by 22% (ISBE, 2015).

The findings of this study supported the pro-consolidation argument, as the researcher found that larger districts (urban size) spent less money and exhibited better student achievement, and the regression equation (YDistrict expenditure = 33.45 - 0.01XDistrict Size) can be utilized as guiding evidence. Although the findings were statistically significant, the current researcher did not set out to determine causality, and therefore cannot state that the size of the district causes lower expenditure and better student achievement. In keeping with the ecological systems approach, one has to point to the myriad of possible factors and relationships that could contribute to student achievement.

As the researcher saw school district size, expenditure per student and the consolidation of school districts as the primary effects on student achievement within the current study, he primarily focused the data analyses on the changes within the direct school environment and the community in which these students interact, which may or may not affect their achievement. The underlying purpose was to determine the ideal ecological circumstances, with regards to student achievement and performance within different school district sizes, in order to ascertain whether and at which point school district consolidation would be the most effective.

In today's high stakes world, it is more important than ever to provide a fiscally efficient public education to all without harming the academic success of any. The findings of this study could be used to enhance public education for generations to come by better preparing educational policymakers and reformers when making recommendations for the development of current and future school district consolidation policy. As seen in the literary analysis of this

study, balancing educational expenditure with student achievement is not an easy undertaking, and based on the findings of this study, for many districts, in order to save costs and increase student achievement simultaneously, consolidation seems like a viable option.

REFERENCES

Adams Jr, J. E., & Foster, E. M. (2002). District size and state educational costs: Should consolidation follow school finance reform? *Journal of Education Finance*, 833-855. Retrieved from: http://www.journalofeducationfinance.com

Amis, J. M., & Aïssaoui, R. (2013). Readiness for change: An institutional perspective. *Journal of Change Management, 1*(13), 69-95. doi:10.1080/14697017.2013.768435

Andrews, M., Duncombe, W., & Yinger, J. (2002). Revisiting economies of size in American education: are we any closer to a consensus?. *Economics of Education Review*, *21*(3), 245-262. doi:10.1016/S0272-7757(01)00006-1

Andrews, L., Higgins, A., Andrews, M., & Lalor, J. G. (2012). Classic grounded theory to analyze secondary data: Reality and reflections. *Grounded Theory Review*, *11*(1), 12-26.

Antonucci, M. (2013). School district size and the Goldilocks problem. *Educational Intelligence Agency.* Retrieved from: http://www.eiaonline.com/intercepts/2013/11/12/school-district-size-and-the-goldilocks-problem/

Arkansas Board of Education [ABE] (2010).

Associated Press (2011).

Augenblick, J., Myers, J., & Silverstein, J. (2001). A comprehensive study on the organization of Kansas school districts. *Prepared for the Kansas State Board of Education in response to RFP*, (00241).

Ayscue, J., & Orfield, G. (2015a). States with highly fragmented school districts have greater levels of school segregation. *USApp– American Politics and Policy Blog.*

Ayscue, J. B., & Orfield, G. (2015b). School district lines stratify educational opportunity by race and poverty. *Race and Social Problems, 1*(7), 5–20. doi:10.1007/s12552-014-9135-0

Babbie, E. R. (2012). *The practice of social research*. Belmont, CA: Wadsworth.

Balcom, J. J. (2013). *Leadership in school district consolidation and the impact on student outcomes.* Drexel University.

Banicki, G. J., & Murphy, G. (2014). Evidenced-based adequacy model for school funding: Success rates in Illinois schools. *Journal of Modern Education Review, 8*(4), 587–597. doi:10.15341/jmer(2155-7993)/08.04.2014/003

Bard, J., Gardener, C., & Wieland, R. (2006). Rural school district consolidation. *Academic Leadership: The Online Journal*, *4*(2), 9. Retrieved from http://scholars.fhsu.edu/alj/vol4/iss2/9/

Barnes, G., & Slate, J. R. (2014). School district size and limited English proficient student performance: A statewide analysis. *Journal of Education Research, 3*(8), 123-128.

Barton, J. D. (2015). *An investigation of the relationship between school size, socio-economic status, expenditure-per-student, mobility rate, and percentage of non-white secondary students taking state science exams.* (Doctoral dissertation, Texas A & M University.)

Berry, C. (2006). School consolidation and inequality. *Brookings Papers on Education Policy*, (9), 49-75.

Berry, C. R., & West, M. R. (2008). Growing pains: The school consolidation movement and student outcomes. *The Journal of Law, Economics, & Organization*, *26*(1), 1-29. doi:10.1093/jleo/ewn015

Bickel, R., & Howley, C. (2000). The influence of scale on school performance. *Education Policy Analysis Archives*, *8*, 22. doi:10.14507/epaa.v8n22.2000

Billger, S. M., & Beck, F. D. (2012). The determinants of high school closures: Lessons from longitudinal data throughout Illinois. *Journal of Education Finance,* 2(38), 83-101.

Bingler, S., Diamond, B. M., Hill, B., Hoffman, J. L., Howley, C. B., Lawrence, B. K., Mitchell, S., … & Washor, E. (2002). *Dollars & sense: The cost effectiveness of small schools.* Retrieved from: http://eric.ed.gov/?id=ED473168

Bolkan, J. (2013). Is school district consolidation worth the cost? *The Journal.* Retrieved from https://thejournal.com/articles/2013/12/05/is-school-district-consolidation-worth-the-cost.aspx?admgarea=Features1

Boser, U. (2013). Size matters: A look at school-district consolidation. *Center for American Progress.* Retrieved from https://www.americanprogress.org/wp-content/uploads/2013/08/SchoolDistrictSize.pdf

Brasington, D. M. (2013). *Public school consolidation: A partial observability spatial bivariate probit approach.* Retrieved from http://economics.ucdavis.edu/events/papers/1012Parent.pdf

Bronfenbrenner, U. (2009). *The ecology of human development*. Harvard University Press.

Burnette II, D. (2016). Consolidation push roils Vermont landscape. *Education Week.* 21(35), 1-19.

Burns, M. K. (2015). Environmental context of learning: Introduction to the special topic. *School Psychology Review*, *2*(44), 147-149. doi:10.17105/spr-15-0046.1

Burns, M. K., Warmbold-Brann, K., & Zaslofsky, A. F. (2015). Ecological systems theory in school psychology review. *School Psychology Review, 3*(44), 249-261. doi:10.17105/spr-15-0092.1

California Department of Education. (2016). *District organization*. Retrieved from http://www.cde.ca.gov

Casto, H. G., Steinhauer, A., & Pollock, P. M. (2013). Potential synergy: Rural school districts and international student programs. *The Rural Educator, 1*(34).

Chicago Tribune. (2012). *Yes, classrooms first.* Retrieved from http://articles.chicagotribune.com/2012-01-31/opinion/ct-edit-consolidate-20120131_1_school-districts-restructuring-of-public-education-cost-effective-education.

Chingos, M., Whitehurst, G., & Gallaher, M. (2013). School district and student achievement. *The Brown Center on Education Policy.* Retrieved from http://www.brookings.edu/~/media/research/files/papers/2013/3/27-school-district-impacts-whitehurst/districts_technical_paper_final.pdf

Church E., & Bland, P. (2012). Process for increasing school district efficiency and effectiveness.

Classrooms First Commission (2012).

Cooley, D. A., & Floyd, K. A. (2013). Small rural school district consolidation in Texas: An analysis of its impact on cost and student achievement. *Administrative Issues Journal: Education, Practice, and Research*, *1*(3), 45-63.

Cox, D. N. (2002). Big trouble: Solving education problems means rethinking super-size districts and schools. *Focus On Utah*.

Coy, C. (2008). Sampling knowledge: The hermeneutics of snowball sampling in qualitative research. *International Journal of Social Research Methodology. International Journal of Social Research Methodology, 11*(4), 327-344.

Cullen, M., Polnick, B., Robles-Piña, R., & Slate, J. R. (2015). Instructional expenditures and student achievement: A multiyear statewide analysis. *Educational Research for Policy and Practice, 14*(93). doi:10.1007/s10671-014-9168-6

Dabrowski, T., & Klingner, J. (2016). Too many districts: Illinois school district consolidation provides path to increased efficiency, lower taxpayer burdens. *Illinois Policy Institute*. Retrieved from https://www.illinoispolicy.org/reports/illinois-school-district-consolidation-provides-path-to-efficiency-lower-tax-burdens/

De Haan, M., Leuven, E., & Oosterbeek, H. (2016). School consolidation and student achievement. *The Journal of Law, Economics, and Organization.* doi:10.1093/jleo/eww006

Diaz, V. (2008). Relationships between district size, socioeconomics, expenditures, and student achievement in Washington. *Rural Educator*, *29*(3), 30-39.

Dobbie, W., & Fryer, R. G. (2013). Getting beneath the veil of effective schools: Evidence from New York City. *American Economic Journal: Applied Economics, 4*(5), 28-60. doi

Driscoll, D., Halcoussis, D., & Svorny, S. (2003). School district size and student performance. *Economics of Education Review*, *22*(2), 193-201. doi:10.1016/S0272-7757(02)00002-X

Duncombe, W., & Yinger, J. (2005). How much more does a disadvantaged student cost?. *Economics of Education Review*, *24*(5), 513-532. doi:10.1016/j.econedurev.2004.07.015

Duncombe, W., & Yinger, J. (2007). Does school district consolidation cut costs?. *Education*, *2*(4), 341-375. doi: 10.1162/edfp.2007.2.4.341

Duncombe, W., & Yinger, J. (2010). The benefits and costs of school district consolidation: What recent research reveals about potential cost savings. *The School Administrator, 5*(67), 10-17.

Duncombe, W. D., Yinger, J., & Zhang, P. (2014). How does school district consolidation affect property values? A case study of New York. *Public Finance Review*, *44*(1), 52-79. doi:10.1177/1091142114524617

Duke, D. L., DeRoberto, T., & Trautvetter, S. (2009). Reducing the negative effects of large schools. Revised. *National Clearinghouse for Educational Facilities*.

Durflinger, N., & Haeffele, L. (2011). Illinois public school district consolidation: A tiered approach. *Center for the Study of Education Policy*.

Elliott, P. (2012). School consolidation and notions of progress: Why community actors almost always lose the fight to keep local schools and how they can turn the tables. *In Education, 18*(1), 50-66. Retrieved from http://ined.uregina.ca/ineducation/article/view/25/445

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using g*power 3.1: Tests for correlation and regression analysis. *Behavior Research Methods, 41*(4), 1149-1160. doi:10.3758%2FBRM.41.4.1149?

Fisher, K. (2012). Many foreign students are friendless in the U.S., study finds. *The Chronicle of Higher Education,* 1-8. Retrieved from http://chronicle.com/article/Many-Foreign-StudentsFind/132275/?cid=gn&utm_source=gn&utm_medium=en

Flaherty, S. (2013). Does money matter in Pennsylvania? School district spending and student proficiency since No Child Left Behind. *Eastern Economic Journal, 2*(39), 145–171. doi:10.1057/eej.2012.7

Flowers, R. (2010). Closing small rural schools: Research brief. *Educational Partnerships*. Retrieved from: http://files.eric.ed.gov/fulltext/ED538325.pdf

Foster, J. B. (2015). *School consolidation and community cohesion in one rural Kansas community: Mount Hope*. Retrieved from: http://krex.k-state.edu/dspace/handle/2097/19152

Gierzynski, A. (2007). *Albuquerque election financing: An analysis.* (Unpublished Manustript, University of Vermont.)

Gershenson, S., & Langbein, L. (2015). The effect of primary school size on academic achievement. *Educational Evaluation and Policy Analysis, 1*(37), 135-155. doi:10.3102/0162373715576075

Gong, Y. (2005). *The size effect of school district on fiscal management, administrative leadership, and student achievement: A comprehensive analysis of school districts in rural Pennsylvania using PSSA and CCD data* (Doctoral dissertation, Indiana University of Pennsylvania).

Gordon, N., & Knight, B. (2008). The effects of school district consolidation on educational cost and quality. *Public Finance Review*, *36*(4), 408-430. doi:10.1177/1091142107305219

Gronberg, T. J., Jansen, D. W., Karakaplan, M. U., & Taylor, L. L. (2015). School district consolidation: Market concentration and the scale-efficiency tradeoff. *Southern Economic Association, 2*(82), 580–597. doi:10.1002/soej.12029

Haagenson, L. A. (2015). Minnesota public school consolidation: Factors most influential when voting in favor of consolidation. *Culminating Projects in Education Administration and Leadership. Paper 4.* Retrieved from http://repository.stcloudstate.edu/edad_etds/4

Hall, J. (2015). Does school district and municipality border congruence matter?. *Urban Studies*, *54*(7), 1601-1618. doi:10.1177/0042098015619868

Hayek, V. P. (2013). *The educational case against school district consolidation: A study of school district structure.* Seton Hall University Dissertations and Theses. Paper 1887.

Heiney, J. N. (2014). Community size and public sector salaries. *Global Business & Economics Anthology, 1*, 26-33.

Howley, C. (2000). School district size and school performance. *Rural Education Issue Digest.* Retrieved from http://www.ael.org/rel/rural/pdf/digest3.pdf.

Howley, C. & Bickel, R. (2000). Research about school size and school performance in impoverished communities. *ERIC Digest.*

Howley, C., Johnson, J., & Petrie, J. (2011). *Consolidation of schools and districts: What the research says and what it means*. Retrieved from http://www.greatlakescenter.org

Humlum, M. K., & Smith, N. (2015). Long-term effects of school size on students' outcomes. *Economics of Education Review, 45*, 28–43. doi:10.1016/j.econedurev.2015.01.003

Illinois General Assembly (2006).

Illinois State Board of Education [ISBE]. (2015). *Annual Report*. Retrieved from http://www.isbe.net/reports/annual15/toc.htm.

Illinois State Department of Education [ISBE]. (2015). *School district reorganization at a glance*. Retrieved from http://www.isbe.net

Indian State Legislation (2007).

Inerman, M., & Otto, D. (2003). *A preliminary investigation of school district expenditures with respect to school district size in Iowa*. Retrieved from www.econ.iastate.edu/research /webpapers/paper-10183.pdf

Jacques, C., Brorsen, B. W., & Richter, F. G. C. (2000). Consolidating rural school districts: Potential savings and effects on student achievement. *Journal of Agricultural and Applied Economics, 32*, 573-583. doi:

Johnson, J., Showalter, D., Klein, R., & Lester, C. (2014). Why rural matters 2013-2014: The condition of rural education in the 50 states. *Rural School and Community Trust*. Retrieved from https://files.eric.ed.gov/fulltext/ED556045.pdf

Kennedy, B., & Tolbert, J. (2012). The Importance of School District Size. *Ohio State University SBSCOL*, *591*.

Kline, R.B. (2005). *Principles and practices of structural equation modelling,* 2nd ed. New York: Guildford.

Koontz, T. M., Gupta, D., Mudliar, P., & Ranjan, P. (2015). Adaptive institutions in social-ecological systems governance: A synthesis framework. *Environmental Science & Policy, B*(53), 139–151. doi:10.1016/j.envsci.2015.01.003

Lawrence, B. K., Bingler, S., Diamond, B. M., Hill, B., Hoffman, J. L., Howley, C. B., ... & Washor, E. (2002). Dollars and sense: The cost effectiveness of small schools. *Cincinnati, OH: Knowledge Works Foundation*.

Lee, J., Lu, R., Sieredzinski, M., & Zervos, A. (2016). *Consolidation as a potential cost saving measure for New Hampshire's Education System*. Retrieved from https://rockefeller.dartmouth.edu/sites/rockefeller.drupalmulti-prod.dartmouth.edu/files/prs_report_nh_educationfinal.pdf

Leedy, P. D., & Ormrod, J. E. (2010). *Practical research planning and design*. Upper Saddle River, NJ: Pearson Education.

Leland, S., & Thurmaier, K. (2014). Political and functional local government consolidation: The challenges for core public administration values and regional reform. *The American Review of Public Administration, 4*(44), 29S-46S. doi:10.1177/0275074014533003

López-Torres, L., & Prior, D. (2016). Centralized allocation of human resources. An application to public schools. *Computers & Operations Research, 73*, 104–114. doi:10.1016/j.cor.2016.04.001

Main State Board of Education [MSBE] (2011).

Miller, K. E. (2013). *The impacts of disaggregated non-instructional school district expenditures on student achievement in California*. Retrieved from https://repository.library.georgetown.edu/handle/10822/558649

Mills, J. N., McGee, J. B., & Greene, J. P. (2013). An analysis of the effect of consolidation on student achievement: Evidence from Arkansas. *EDRE Working Paper No. 2013-02.*

Molitor, R. (2014). *The relationship between the nature of perceived communication, student achievement and district size*. (Doctoral dissertation, George Fox University).

Moore, R. L., Combs, J. P., & Slate, J. R. (2014). High school size and White student college readiness: A statewide, multiyear analysis. *NCPEA Education Leadership Review of Doctoral Research, 1*(1), 142-156.

Mustafa, R. F. (2011). The P.O.E.Ms of educational research: A beginners' concise guide. *International Education Studies*, *4*(3), 23-30. doi:10.5539/ies.v4n3p23

National Center for Education Statistics (2014). *Digest of Education Statistics*. Retrieved from: https://nces.ed.gov/programs/digest/d12/tables/dt12_098.asp

National Education Association [NEA]. (2014). *Rankings & Estimates: Ranking of the States 2013 and Estimates of School Statistics 2014.* Retrieved from http://www.nea.org/assets/docs/NEA-Rankings-and-Estimates-2013-2014.pdf.

Neal, J. W., & Neal, Z. P. (2013). Nested or networked? Future directions for Ecological Systems Theory. *Social Development, 4*(22), 722–737. doi:10.1111/sode.12018

New Jersey State Board of Education (2007).

Nguyen-Hoang, P., & Yinger, J. (2014). Education finance reform, local behavior, and student performance in Massachusetts. *Journal of Education Finance, 4*(39), 297-322.

North Carolina Department of Public Instruction. (2014). *North Carolina public school guidelines on facilities planning.* Retrieved from http://www.schoolclearinghouse.org/pubs/facguid.pdf

Ogaz, D. A. C. (2016). *Multivariate approaches to school climate factors and school outcomes.* (Doctoral dissertation, University of Sussex).

Parrish, J. R. (2015). *A study of the effectiveness of a truancy reduction program for middle and high school students.* Retrieved from http://scholarscompass.vcu.edu/etd/3868/?utm_source=scholarscompass.vcu.edu%2Fetd%2F3868&utm_medium=PDF&utm_campaign=PDFCoverPages

Pennsylvania School Board of Education [PSBE] (2009).

Preston, J. P., Jakubiec, B. A. E., & Kooymans, R. (2013). Common challenges faced by rural principals: A review of the literature. *Rural Educator, 1*(35).

Pulido-Martos, M., Augusto-Landa, J., M., & Lopez-Zafra, E. (2012). Sources of stress in nursing students: A systematic review of quantitative studies. *International Nursing Review, 59*, 15–25. doi:10.1111/j.1466-7657.2011.00939.x

Quinn, P. (2011). *Budget address*. Retrieved from http://www2.illinois.gov/budget/documents/fy%202012/fy12_budget_speech.pdf

Redden, E. (2012). *Tensions simmer between American and international students. Inside higher ed.* Retrieved from http://www.insidehighered.com/news/2012/10/16/tensions-simmer-between-american-and-international-students

Reingewertz, Y. (2012). Do municipal amalgamations work? Evidence from municipalities in Israel. *Journal of Urban Economics, 72*(2-3), 240–251. doi:10.1016/j.jue.2012.06.001

Reschly, A. L., & Coolong-Chaffin, M. (2015). Contextual influences and response to intervention. *Handbook of Response to Intervention, 441-453.*

Riha, M. W., Slate, J. R., & Martinez-Garcia, C. (2013). What we know about middle school size and student performance: A review of the literature. *Journal of Education Research, 3*(7), 205-229.

Robertson, F. W. (2007). Economies of scale for large school districts: A national study with local implications. *The Social Science Journal*, *44*(4), 620-629. doi:10.1016/j.soscij.2007.10.005

Rogers, J. D., Glesner, T. J., & Meyers, H. W. (2014). Early experiences implementing voluntary school district mergers in Vermont. *Journal of Research in Rural Education, 29*(7), 1-14.

Ross, J. M., Hall, J. C., & Resh, W. G. (2013). *Frictions in polycentric administration with noncongruent borders: Evidence from Ohio school district class sizes.* doi:10.1093/jopart/mus090

Schmidt, R., & Schlottmann, A. (2007). Does school district size matter? *Nevada Policy Research Institute*. Retrieved from https://npri.org/docLib/20071126_District_Size.pdf

Scribner, C. F. (2016). *The fight for local control.* Cornell University Press. Retrieved from https://muse.jhu.edu/book/46198

Silverman, R. M. (2014). Urban, suburban, and rural contexts of school districts and neighborhood revitalization strategies: Rediscovering equity in education policy and urban planning. *Leadership and Policy in Schools, 1*(13), 3-27. doi:10.1080/15700763.2013.876051

Silvernail, D., & Sloan, J. (2004). EPS maintenance expense: Preliminary analysis. *Maine Education Policy Research Institute, University of Southern Maine Office*.

Smithson, J. (2016). *What really happened when districts consolidate? School Status.* Retrieved from http://blog.schoolstatus.com/what-happens-when-schools-consolidate

State of Illinois (2011).

Stevenson, K. (2006). *School size and its relationship to student outcomes and school climate: A review and analysis of eight South Carolina state-wide studies.* Retrieved from http://www.edfacilities.org/pubs/size_outcomes.pdf

Taylor, J. A., Van Scotter, P., & Coulson, D. (2007). Bridging Research on Learning and Student Achievement: The Role of Instructional Materials. *Science Educator*, *16*(2), 44-50.

Vermont Agency of Education (2011).

Ward, J., & Rink, F. (1992). Analysis of local stakeholder opposition to school district consolidation: An application of interpretive theory to public policy making. *Journal of Research in Rural Education, 2(*8), 11-19. Retrieved from http://jrre.vmhost.psu.edu/

Weldon, T. (2012). The promises and perils of school district consolidation. *The Council of State Governments.* Retrieved from http://knowledgecenter.csg.org/kc/content/promises-and-perils-school-district-consolidation

Welsch, D. M., & Zimmer, D. M. (2016). The dynamic relationship between school size and academic performance: An investigation of elementary schools in Wisconsin. *Research in Economics, 1*(70), 158–169. doi:10.1016/j.rie.2015.07.006

Willborn, S. L. (2013). *Tiebout in the country: The inevitable politics of rural school consolidation.* doi:10.2139/ssrn.2344427

Wu, J., & David, J. L. (2002). A spatially explicit hierarchical approach to modeling complex ecological systems: Theory and applications. *Ecological Modelling, 1-2*(153), 7–26. doi:10.1016/S0304-3800(01)00499-9

Xia, J., Gao, X., & Shen, J. (2015). Principals' and teachers' decision making power in small, medium, and large school districts. *Advances in Educational Administration, 22*, 65-83. doi:10.1108/S1479-366020150000022014

Yan, W. (2006). *Is bigger better? A comparison of rural school districts.* Center for Rural Pennsylvania.

Yang, K., & Banamah, A. (2014). Quota sampling as an alternative to probability sampling? An experimental study. *Sociological Research Online, 19,* 29-49. doi:10.5153/sro.3199

APPENDIX A: RESULT OF G*POWER SAMPLE SIZE COMPUTATION