A COMPARATIVE ANALYSIS OF STATE FUNDS ON STUDENT ACHIEVEMENT OF ECONOMICALLY DISADVANTAGED ELEMENTARY SCHOOLS IN INDEPENDENT SCHOOL DISTRICTS AND CHARTER SCHOOLS IN THE STATE OF TEXAS

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Dissertation Prepared for the Degree of

DOCTOR OF EDUCATION

UNIVERSITY OF NORTH TEXAS

May 2015

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Applewhite, Gary. A Comparative Analysis of State Funds on Student Achievement of Economically Disadvantaged Elementary Schools in Independent School Districts and Charter Schools in the State of Texas. Doctor of Education (Education Leadership), May 2015, 79 pp., 11 tables, references, 81 titles.

The purpose of this study was to evaluate the relationship between the instructional outcomes in the independent school districts and charter schools in relation to the expenditure of public funds for instruction and total operating expenditures from the general fund. The study considered Texas elementary charter schools and independent school districts, whose school populations were identified as having greater than or equal to 50% of economically disadvantaged students, according to the Texas Academic Excellence Indicator System (AEIS). The study made use of multiple regression and was an ex post facto cross-sectional analysis utilizing production function theory. The study's outcomes reported the difference in student achievement between elementary schools in independent public school districts and charter schools were small to negligible for math and reading achievement. The study also reported, there is no statistically significant difference in per pupil expenditure of public funds between elementary schools in independent public school districts and charter schools. Furthermore, there is no statistically significant relationship between student achievement and per pupil expenditure of public funds on elementary schools in independent public school districts and charter schools.

ACKNOWLEDGMENTS

I give thanks, praise and glory to my Heavenly Father for giving me all the blessings He has bestowed upon me. One of those many blessings the soul mate that He created for me, Stephanie through His wisdom and guidance I found her and thankfully she took on a helpless case of head over heels in love football player that desperately needed someone smarter than him to love and gently guide him.

Stephanie, where do I begin? How do I express my love, admiration, thankfulness, appreciation, gratefulness and shear devotion to you? After almost 25 years, you are still my #1 cheerleader, supporter and fan. I don't know what I did for God to bless me with you, but I am thankful He did. Thank you for everything honey. I love you more than mere words can express.

To mom and dad, thank you for all the years of support through this journey. To Janet and Billy, your love and support through the years has made this possible, thank you. To my brother Keith and my best friend Des, thank you for the constant encouragement along the way. To my children, Ryan, Zack and Savannah, you inspire me to keep learning.

To Texans Can! Academy, Wells ISD, and all of the teachers and students along the way, thank you for reminding me each day what education is all about, the kids. While, this dissertation may be over the research to inform educators, school boards, ISD's, charter schools, politicians, business leaders and all stakeholder how to better serve our children, marches on.

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CHAPTER 1

INTRODUCTION

With the implementation of No Child Left Behind (NCLB, 2002), the relationship between school funding and achievement has received considerable attention (Godwin & Kemerer, 2002; Hoxby, 2004a; Pan, Rudo & Smith-Hansen, 2003) leading to research evaluating the connection between student achievement and the per pupil expenditure of public funds. Additionally, accountability standards exist in which all students are expected to demonstrate high rates of achievement on standardized tests. Of particular concern is the achievement of economically disadvantaged students (Fernandez, 2002; Ford & Moore, 2004; Jackson & Moore, 2006). In addition, the amount of public funds spent on public education has come into question, in relationship to student performance on state standardized tests (Cuomo, 2010; Duncan, 2010; Freeman, 2010 Baker, 2012). In Texas, state funding policies and practices for traditional public schools and public charter schools are not equitable (Hoxby, 2004b), and finances for education across the nation continue to be a political hot topic from the U.S. Department of Education to individual states (Hoxby, 2004b; Pan et al., 2003; Simpson, Kite, & Gable, 2008; Turley, 2009) as the expectation of accountability standards has persisted through NCLB (2002).

Consistent voices in this debate have always included the U.S. Department of Education and governors from across the nation; however, newer voices are emerging in the discourse to include notable business leaders and educational philanthropists. In 2010 at the American Enterprise Institute, U.S. Secretary of Education, Arne Duncan, vocalized how states across the country were slashing educational budgets while

holding their schools to the same standards, and explicated that educational leaders will have to learn to do more with less, ushering in the “new normal” (Duncan, 2010). Governor Andrew Cuomo of New York stated that the New York state education budget had grown 6% per year from 1994-2009 and that the state was spending more on education than any other state in the nation yet were only 34th in terms of student performance (Cuomo, 2010). The relationship between spending and achievement was highlighted in both speeches, but from differing perspectives. Duncan (2010) was calling for high academic standards with less spending, while Cuomo (2010) expressed concern that despite increased expenditures, student achievement was poor. Governor Chris Christie of New Jersey echoed Governor Cuomo sighting Newark, New Jersey schools were spending $22,000 per student while less than a third of them were graduating from high school (Freeman, 2010).

Continuing in 2011, the Governor of Florida, Rick Scott, enumerated, “We’re spending a lot of money on education, and when you look at the results, it’s not great” (Baker, 2012, p. 1). Whereas Texas Governor, Rick Perry, refused to comment on the education financial situation in Texas after state District Judge John Dietz ruled, “The Court declares that the school finance system violates the ‘efficiency’ provisions of Article VII, §1 of the Texas Constitution, in that it fails to provide substantially equal access to revenues necessary to provide a general diffusion of knowledge” (Texas Taxpayer Student Fairness Coalition et al. v. Michael Williams et al., 2013, p.1). Judge Dietz also ruled that Texas’ current school finance system violated its state constitution and clarified, “It is inefficient, inequitable and unsuitable and arbitrarily funds districts at different levels below the constitutionality required level of the general diffusion of

knowledge" (*Texas Taxpayer Student Fairness Coalition et al. v. Michael Williams et al.,* 2013, p. 3).

Finally, at the National Governors Association meeting, renowned business leader, multi-billionaire and educational philanthropist Bill Gates argued, "The history of education is that over the last 20 years the spending has gone up and it has nearly doubled the per-pupil expenditure," while student achievement measured through standardized scores had remained fairly flat, concluding, "it's a big investment and yet the outcomes have not changed that much" (Gates, 2011). Each of these politicians and business leaders expressed concerns that educational spending is not resulting in higher academic achievement.

While political and business leaders alike may use whatever research that suits them to obtain the headline of the day, the amplified public education conversation has turned to the nations' and states' educational budgets and student achievement. The 1966 study by James Coleman entitled, *Equality of Educational Opportunity*, has been one of the most quoted studies by political leaders validating that the quality of education is not affected by finances (Baker, 2012). Coleman (1966) concluded that funding was not a primary factor of differences in student achievement between schools. Politicians have used this study to positively conclude that the amount of money spent on education does not matter and that student achievement and overall school performance can be improved notwithstanding, or in the face of, reductions in educational expenditures (Baker, 2012). However, what those same politicians fail to mention is that the Coleman report (1966) has been re-analyzed several times using newer statistical techniques and software that reveal very different results than those

the politicians depend upon (Beggs, 2013; Hanushek, 1989, 1994, 1997).

In an effort to provide solutions to the student achievement and funding dilemmas, researchers began to discuss the possibilities of school choice (Allen, 2006; Betts & Loveless, 2005; Clark, 2000; Hoxby, 2000; Peterson & Hassel, 1998). One component of school choice was the development of charter schools. In Texas, charter schools first appeared in 1995 (Clark, 2000). Charters agreed to accept the same responsibility of student achievement standards as traditional public schools, but without maintenance and operation funding; however, charter schools often spend more for maintenance and operations than traditional public schools (Clark, 2000).

In essence, these schools believed that they could equal or exceed student success rates with less state funding than the traditional public schools. This difference in state funding, according to Clark (2000) is "because they [charter schools] do not levy property taxes and cannot impose debt service property taxes; charter schools do not have access to state aid for facilities" (p. 5). However, charter schools access additional funding through private gifts, grants, and fund raising efforts (Clark, 2000). An important clarification is the difference between funding and the expenditure of funds, (i.e., spending). According to Clark (2000), charters spent less per pupil than traditional public schools, but received more revenue. There is a need to better understand the relationship between expenditures and achievement in both traditional and charter public schools, in order to inform educational leaders (Waldrip, 2008, p. i). This study addressed that need.

Problem Statement

This study addressed whether or not school expenditures predicted student achievement in math and reading in Texas independent school districts and charter elementary schools whose school population were identified as having greater than or equal to 50% of economically disadvantaged students. Although the issues of school funding, expenditures and student achievement have been researched and debated prior to NCLB, since the passing of NCLB concerns regarding school finance and academic achievement have been renewed (Baker, 2012; Beggs, 2013; Bohte, 2004; Borman & Dowling, 2010; Duncan, 2010; Gates, 2011; Hoxby & Kuziemko, 2004; Odden, 2003; Pan et al., 2003; Simpson et al., 2008; Turley, 2009). According to NCLB (2002) all students are expected to reach academic standards regardless of socioeconomic, at-risk, or learning disability status.

Both charter and traditional public schools are held to the same achievement standards, but usually approach spending differently. This study considered the differences in spending and achievement in charter and traditional independent school district elementary schools in Texas whose school population were identified as having greater than or equal to 50% of economically disadvantaged students.

In past and current research the production function theory has been utilized to measure and analyze inputs and outputs to determine a rate of effectiveness (Coleman, 1966; Greenwald, Hedges, & Laine, 1996; Hanushek, 1997; Hanushek & Rivkin, 2010). In essence, production function analysis is what was needed for educational leaders and politicians to understand the possible effects and outcomes of reform measures that relate to school spending and achievement. Early life interventions suggest that

elementary reforms are critical for the success of economically disadvantaged students (Beggs, 2013 & Suh, 2013). With this research, law makers and district leaders will have a greater understanding of the relationship between educational spending and academic achievement on elementary, economically disadvantaged school achievement in Texas.

Purpose of the Study

The purpose of this study was to evaluate the relationship between the instructional outcomes in the independent school district classrooms and the charter school classrooms in relation to the expenditure of public funds for instruction and total operating expenditures from the general fund. Specifically, this study evaluated student data in reading and mathematics and school expenditures for instruction and total operating expenditures for Texas elementary schools, both charter and independent school districts, whose school population were identified as having greater than or equal to 50% of economically disadvantaged students.

Research Questions

Considering the difference in funding between charter elementary schools and elementary schools in independent school districts in the state of Texas (Resource Center for Charter Schools, 2007; Hoxby, 2001b, 2004a, 2004b) the following research questions guided this study:

1. What is the difference in student achievement between elementary schools in independent public school districts and charter schools in the state of Texas

that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged?

2. What is the difference in per-pupil expenditure of public funds between elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged?
3. What is the relationship between student achievement and per-pupil expenditure of public funds on elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged?

Theoretical Framework

The theoretical framework for this study was established in the Coleman Report (1966) when Dr. James Coleman pioneered the transition of the economic model "production function" for the purpose of analyzing student achievement and school finances. Hanushek (1997) supported the utilization of the production function model as a framework to answer similar questions regarding school expenditures and student outcomes. A production function "is used to describe the important and powerful variables contributing to student performance outcomes like test scores" (Pan et al., 2003). A critical component of this study was to determine how the expenditure of school resources affects student performance in independent school districts and charter schools so the two systems can be evaluated.

The production function model was created for the purpose of evaluating the

relationship of outputs and inputs by Wicksteed in 1894 (Mishra, 2007). According to Mishra (2007) Wicksteed was an economist that developed the algebraic equation, $P = f(x^1, x^2, ..., x_m)$ (p. 1) stating that production is equal to the multiple functions that multiplicatively come together to create the product."

While within education, achievement is only one measurable output, other outputs exist that are not as easily quantifiable. These outputs may include self-efficacy in students and the development of meaningful relationships with peers, mentors, and teachers. Traditionally, production function was designed to measure for a single output but as the model evolved, it has elasticized and is considered viable for measuring multiple inputs and outputs (Mishra, 2007). Additionally, researches (Hanushek, 1997 & Waldrip, 2008) continue to utilize the production function model with a form of multiple regression analysis. Consequently, past research labors have assisted in expanding the breadth and profundity of our understanding of the role of school resources and effect on student achievement (Pan et al., 2003). This study draws from existing knowledge of production function and explores its linkage between financial expenditures and student performance.

Throughout the history and evolution of the production function model there have been concerns about the use of production function outside of pure economic analyses (Humphrey, 1997). According to Mishra (2007), "In many theoretical and most empirical studies it [production function] is loosely defined as a technical relationship between output and inputs, and the assumption that such output is maximal (and inputs minimal) is often tacit" (p. 2). In other words, by using the production function model there may be variables that could add value to the outcomes that will not be considered, thus

posing the following question. Why not use a value added model as the theoretical framework? Sanders and Horn (1995) who pioneered value added models cautioned against using value added models only. Ewing (2011) also observed that while value added models were a new instrument allowing researchers to make meaning of large amounts of data, caution was needed, as inferences might not be valid "either because of faulty assumptions or because of normal (and expected) variations" (p. 669). Additionally, according to Hanushek and Rivkin (2010) value added models bring a "separate set of issues as to whether omitted variables lead to biased estimates" (p. 268). Thus the production function theoretical model is a superior model for this study.

Significance of the Study

This study will serve to inform stake-holders such as legislators, researchers, educational and community leaders, and parents as to the connection or lack thereof between the expenditure of public funds and student achievement in both types of Texas elementary school systems serving economically disadvantaged populations. By determining whether or not per pupil expenditures predict student achievement between elementary schools in independent school districts and charter schools in the state of Texas that serve greater than or equal to 50% of economically disadvantaged students, researchers, state legislators, school district administrators, charter school operators, campus administrators, communities and parents will be armed with valuable information to inform the decision-making for the stake-holders concerned.

The significance of this study will be the outcomes produced from the study. The study will shed light on the whether or not per pupil expenditures predict student

achievement between elementary schools in independent school districts and charter schools in the state of Texas that serve greater than or equal to 50% of economically disadvantaged students. Furthermore, this study will contribute to the debate and concerns regarding expenditure of public funds and achievement by informing the opposing views i.e. charter school proponents (Resource Center for Charter Schools, 2007) and politicians and business leaders (Baker, 2012, Cuomo, 2010, Duncan, 2010, Freeman, 2010 & Gates, 2011).

Rationale for the Study

School finance and the expenditure of public funds has historically been a highly debated topic (Coleman, 1966; Hanushek, 1997; Hoxby, 2000, 2001a; La Noue, 1972). Since the passing of the NCLB act of 2002, concerns about adequate and equitable funding and the expenditures of those funds have resulted in the need for evidence to support or disprove the idea that achievement is dependent or related to funding and funding expenditures (Betts & Loveless, 2005; Hoxby, 2004b; Reyes & Rodriguez, 2004).

Definitions and Terms

- Average daily attendance (ADA) - Daily attendance of an independent, consolidated or charter school district or a campus averaged over a school year (Luke, 2007).
- Academic Excellence Indicator System (AEIS) - “The AEIS contains performance data and descriptive characteristics for all Texas public school districts and campuses. Local districts share responsibility for disseminating the AEIS reports,

including holding hearings for public discussion of the AEIS report content" (State of Texas, 2009).

- Charter school – "Charter school districts are open-enrollment school districts chartered by the State Board of Education. Established by the Texas Legislature in 1995 to promote local initiative, charter school districts are subject to fewer regulations than other public school districts. Generally, charter school districts are subject to laws and rules that ensure fiscal and academic accountability but do not unduly regulate instructional methods or pedagogical innovation. Like other public school districts, charter school districts are monitored and accredited under the statewide testing and accountability system" (Texas Education Agency, 2014a).
- Economically disadvantaged - "A student is reported as economically disadvantaged if he or she is eligible for free or reduced-price meals under the National School Lunch and Child Nutrition Program" (Texas Education Agency, 2014a).
- Existing debt allotment – "The Existing Debt Allotment program provides funding to school districts for debt service payments on eligible bonded debt" (Texas Education Agency Office of School Finance, 2010, p. 8).
- Foundation School Program (FSP) – Texas' state program that determines the amount of state and local funds each school district is entitled to under Texas school finance law (Texas Education Agency, 2014b).
- Independent school district (ISD) - A public school system defined geographically within the state of Texas which operates as an entity independent and separate from municipalities and counties and whose leadership, a school board of trustees, is elected by the citizens with the said geographic boundaries. It should also be noted

that each ISD has taxing authority that is also outside of the control of other governmental agencies and entities (Wikipedia, n.d.).

- Instructional Facility Allotment (IFA) – Provides funds to ISD's for payments made on debt for facilities purchased, constructed, renovated or expanded (Texas Education Agency, 2014b).
- No Child Left Behind (NCLB) - An act, passed by Congress in 2001, encouraging standards-based educational reform and requiring states to develop testing in fundamental skills to be given to all students in certain grades, if those states choose to receive federal funding for education (Texas Education Agency, 2014b).
- Per pupil expenditure - The amount of money spent on each individual student in a given school year.
- Production function - Contends that a maximum output or outcomes are achieved as a result of a set of input factors. If the resources (inputs) are allocated in a way that maximizes their net benefit, then the unit is allocatively efficient. An education production function would produce an outcome from a set of inputs that provided schools with the maximum amount of education possible from the inputs provided. For the purposes of this study, the inputs are the financial variables taken from the Texas AEIS database and the outcome is a continuous ratio variable composed of the percent of students passing the Texas Academic Knowledge and Skills (TAKS) test in reading and math on the Texas Academic Excellence Indicator System (Schwartz & Stiefel, 2001, pp. 115-137).
- Student achievement - State assessment scores reported as the percent of students passing a test on the AEIS report for each school represented in this study.

- Texas Assessment of Knowledge and Skills (TAKS) – “assessments are criterion-referenced achievement tests designed to measure the extent to which a student has learned and is able to apply the defined knowledge and skills at each tested grade level” (Texas Education Agency, 2014b).
- Texas Education Agency (TEA) - “The state executive agency for primary and secondary public education and is responsible for guiding and monitoring certain activities related to public education in Texas” (Texas Education Agency, 2012, p. 8).
- Texas Education Code (TEC) – “A set of the state statutes (laws) governing public education in Texas” (Texas Education Agency, 2014b). "The TEC directs the goals and framework of public education in Texas. It is established by the Texas Legislature” (Texas Education Agency, 2014b).
- Weighted average daily attendance (WADA) - is a “figure used in several state funding formulas to calculate the amount of state and local funds a district is entitled to” (Texas Education Agency, 2014b p. 21).

Assumptions

It is assumed all data reported to the Texas Education Agency by elementary schools in Independent School Districts and Charter Schools in the state of Texas are accurate. It is further assumed that all data from the Texas Education Agency in the AEIS are accurate.

Limitations

Although this study applies statistical measures to determine the difference in

student achievement, the difference in per pupil expenditure of public funds, and the relationship between student achievement and per pupil expenditure of those public funds, there are limitations to the scope of the research. Private schools are not measured as the study focused on elementary schools in independent school districts and charter schools. Regional and economic variations in cost of instruction were not measured in the study. For Research Question 3 total operating per-pupil expenditures were not analyzed due to multi-collinearity. Additionally, the demographic variable of African American had to be excluded because the statistical model became unstable when present. Only data obtained from the TEA was employed to measure each of the research questions.

The following limitations are present in this study:

- Data is obtained on student achievement from the Texas Education Agency.
- The study is limited to Grades 3, 4 and 5.
- The study is limited to the 2010-2011 TAKS test for reading and math.
- No single student “achievement test completely and accurately measures true student knowledge. The selection of specific questions, random events surrounding testing situations, familiarity with the tests, and other factors can lead measured scores to differ from true, under lying student knowledge” (Hanushek & Rivkin, 2010, p. 268).
- Data is obtained on expenditure of funds from the Texas Education Agency.
- Per pupil expenditure for instruction and total operating expenditures were the only financial expenditures analyzed.
- The study is limited to the public school finance system in Texas.

- The study is limited to independent school districts and charter schools in the state of Texas that serve greater than or equal to 50% economically disadvantaged students.

CHAPTER 2

LITERATURE REVIEW

The purpose of this literature review was to discuss the historical context of school finance, and how the evolution of educational finance policies have contributed to the relationship between student achievement and school expenditures. Specifically, this literature review focused on issues of financial efficiency and academic effectiveness as it relates to student achievement in Texas with regard to charter public schools and independent school districts. Finally, the concern for at-risk student populations was examined as it relates to school finance and student achievement.

School finance has historically been a highly debated topic (Coleman, 1966; Hanushek, 1997; Hoxby, 2000, 2001; La Noue, 1972; Wise, 1983). The progression of the school finance debate evolved into a more focused concern in which school funding was critically analyzed for its ability to impact student achievement (Betts & Loveless, 2005; Coleman, 1966; Greenwald, Hedges & Laine, 1996; Hanushek, 1981; Hanushek, 1989; Hoxby, 2001). Emerging from these debates was the idea of school choice (Reyes & Rodriguz, 2004; Sunderman, 2010), which evolved into the charter school movement (Hoxby, 2000, Reyes & Rodriguez, 2004). Concerns about inequities in Texas' school finance policies have resulted in litigation, debates, and policy revisions (Beggs, 2013; Harter, 1999; Texas Taxpayer & Student Fairness Coalition, et al., v. Michael Williams, et al., 2013; Turley, 2009).

Historical Context of School Finance and Student Achievement

Several studies have informed the development of educational funding models,

which resulted in policies and practices that were intended to address issues of school finance and student achievement (Coleman, 1966; Hanushek, 1997; Hoxby, 2000, 2001). The Civil Right Act of 1964 prompted research which resulted in the Coleman Report of 1966. The findings of the Coleman Report (1966) created controversy regarding school finance and student achievement (Bowles & Levin, 1968; Hanushek & Kain, 1972; Mostellar & Moynihan, 1972). This section discusses the historical timeline of these research efforts and their connections to the issue of school finance and student achievement.

The Civil Rights Act of 1964 was enacted by the 88th United States Congress on July 2, 1964 and was designed to: enforce the right to vote for all U.S. citizens, provide relief against discrimination, protect constitutional rights of access and non discrimination in public facilities and education, extend the Commission on Civil Rights, prevent discrimination and establish a Commission on Equal Employment Opportunity (U.S. Congress, 1964)). At the heart of the Civil Rights Act of 1964 was the issue of equality, as its intention was to outlaw discrimination against race, ethnicity, religion, and gender. Public education is an entity that encompasses all the groups represented in the Civil Rights Act of 1964. In an effort to identify issues within the public education system, it was necessary to commission a large study.

The *Equality of Educational Opportunity* (i.e. the Coleman report), was commissioned by the U.S. Commissioner of Education, Harold Howe II and presented to the president of the United States, president of the Senate, and the speaker of the House (Coleman, 1966). This report became a widely recognized research project that fueled politicians' perspectives about school funding and student achievement.

The expectation of the Coleman report was that it would verify that “the funding differences between black and white schools would be large, and that these differences would provide the central explanation for unequal achievements of blacks and whites” (Kahlenberg, 2001, p. 55). The findings however, did not validate this assumption. According to Kahlenberg (2001), the Coleman Report discovered that the disparities in funding between schools attended by blacks and whites were far smaller than anticipated. Second, funding was not closely related to achievement, family economic status was far more predictive. Third, a different kind of resource—peers—mattered a great deal (Coleman, 1966, pp. 55-56). The economic model of production function was the lens used to analyze the data in the Coleman Report (Pan, Rudo, & Smith-Hansen, 2003. According To Pan, Rudo, Schneider, and Smith-Hansen (2003), “a production function is used to describe the important and powerful variables contributing to student performance outcomes like test scores or high school graduation rates” (p. 12). These findings led to debates and ultimately policies that disregarded the impact of school funding on student achievement and placed the focus on issues such as racial integration through busing (Bowles & Levin, 1968; Campbell, 1969; Coleman, 1966; Mostellar & Moynihan, 1972).

The responses of other researchers to the Coleman Report varied and included questions of validity. Ultimately, the need for more research emerged as educational leaders and politicians wanted to better understand the connections between school finance and student achievement, especially for marginalized populations (Coleman, 1966).

Recent Responses to School Finance and Student Achievement

As the need for more understanding about the connections between student achievement and school finance continued to emerge, researchers attempted to contribute findings. Within these findings was a call to identify reliable criteria to analyze the effects of spending on student success. School finance and student achievement was highlighted in National Research Council (1999), which stated, “Educational policymaking is now in a state of indeterminacy. No satisfactory criteria exist by which to make important decisions regarding school finance” (p. 161). This statement indicated that a need for more specific research was needed on how school finances affect student achievement in order to better guide policy makers. To address the need for valid studies using reliable criteria, it is necessary to understand the function of student assessment because within this dissertation, student assessment data is a key variable of the study.

Another factor that emerged near this time was the No Child Left Behind (NCLB) Act (2002), which set into motion a movement towards standards-based education that was intended to ensure that every child received an equitable education, which would ideally narrow the achievement gap. NCLB (2002) prompted researchers, politicians, practitioners, and educational leaders to identify areas of inequity that were preventing student success. One of the areas identified was school funding and finance practices and policies (Adnett & Davies, 2002; Godwin & Kemerer, 2002; Pan et al., 2003) and the relationship between student achievement and school funding and expenditures. According to Pan et al. (2003), “attention has shifted somewhat away from equity issues to focus on the continuing rise in performance standards and the expectation for

adequate resource support for student achievement" (p. 3). Funding models continue to be challenged for effectiveness regarding equity and adequacy. Expenditure of public funds on education and student achievement were identified as valuable variables for measuring finance impacts on student success; therefore, this dissertation used student achievement data and per pupil expenditure of public funds data to see if there was a relationship between student achievement and per pupil expenditure of public funds within the same state.

To determine the most effective way of analyzing the effects of per pupil expenditures on student achievement, a look into other studies revealed some concerns. Much of the current research on student achievement and school funding and expenditures focused on the historical research using reevaluations and meta-analysis to draw conclusions about school finance and student achievement connections. Greenwald et al. (1996)96) conducted a meta-analysis in which they concluded that "a broad range of school inputs are positively related to student outcomes, and that the magnitude of the effects are sufficiently large to suggest that moderate increases in spending may be associated with significant increases in achievement" (p. 362). The implication of these findings is that the methods used to analyze the educational production function may result in varied conclusions. Pan et al. (2003) "reviewed the results of hundreds of production function studies only to conclude that he could find no systematic, positive relationship between school resources and student performance" (p. 13). They also concluded that while the numerous studies contributed to a broader understanding of the relationship between school finances and student achievement, there are still many unanswered questions.

In an attempt to clarify the relationship between funding, spending and student success, Pan et al. (2003) conducted a broad research effort with an emphasis on the differences between low and high performing schools and school finance. This research validated that there was indeed a connection between school finance and student achievement. Pan et al. (2003) found a "strong relationship between resources and student success. Furthermore, the results indicated that allocating resources within select areas and for certain practices might make a significant impact on student performance. In short, both the level of resources and their explicit allocation seem to affect educational outcomes" (p. vi). Specifically, Pan et al. (2003) discovered, "a general pattern emerged where higher performance was associated with higher spending for instruction, core expenditures, and number of teachers and with lower spending for general administration and number of administrative staff" (p. vi). In conclusion, the "major findings from this research indicated that states, districts, and schools need to consider the allocation and application of fiscal and non-fiscal resources an integral part of the education reform process" (pp. vii-viii). The issue of how schools allocate their resources became a focus of research

Simpson, Kite and Gable (2008) hypothesized that student achievement comes from the positive or negative manner in which an organization utilizes its resources. They specifically sought to identify how the socioeconomic status of the community, and how schools performed in multiple areas such as in math and ELA related to resource allocations. Simpson et al. (2008) was successful in identifying that there are multiple factors to be considered when researching the connections of research to student achievement and the reality is that since this research was conducted, the level of

indeterminacy of district level performance is still a concern for policy makers and educational leaders.

Baker (2012) determined that money does matter when evaluated in both short term and long term student achievement. Baker (2012) specifically discussed the relevance of per pupil expenditures to impact student outcomes in a positive manner. Borman and Dowling (2010) found that "Even after statistically taking into account students' family background, a large proportion of the variation among true school means is related to differences explained by school characteristics" (p. 1,201). Konstantopolous and Borman (2011) also concluded that funding matters, and Borman (2011) also considered factors related to school finance and student achievement, but specifically analyzed how school effects impacted student achievement between schools with an emphasis on marginalized populations such as disadvantaged students. Konstantopolous and Borman (2011) concluded that school effects such as student attendance, mobility, and student access to resources such as books, programs, labs, and facilities do correlate to student achievement. Ultimately, the use of school funds is relevant to many of the factors analyzed in Konstantopolous and Borman (2011).

The studies in this review of literature influenced the decision to focus on per pupil expenditures and differences in student achievement between differently funded schools within this dissertation. The two differently funded public school systems that were identified for this study were traditionally funded public, independent school districts, and alternatively funded public charter schools. Given the funding differences of these systems, there is a need to examine their per pupil expenditures as it relates to student achievement. In an effort to contribute to further understandings about these

relationships, this study focused on elementary schools that served a low socioeconomic population of students.

School Choice: Charter and Traditional Public Comparisons

A body of research that has developed regarding school choice, charter school funding, and achievement in comparison to traditional public school funding and achievement is from Caroline Hoxby (2001a, 2001b, 2003, 2004a; Hoxby & Murarka 2006). Hoxby (2001a) considered the effects of achievement and funding on school choice. Hoxby (2001a) stated, “A school that is more productive is one that produces higher achievement in its pupils for each dollar it spends” (p. 1). Within Hoxby (2001a), the various outcomes of school choice, including charter schools that evolve from both private and public schools, were considered with regard to productivity. Hoxby (2001b) concluded that Arizona public schools raised achievement in the face of competition from charter schools, and their improvements occurred after they faced charter competition above a critical level at which we might expect them to take notice of their students being drawn away by charter schools (p. 14).

Hoxby (2001b) spoke to the impact of competition from charter schools in improving achievement in traditional schools and continued the research in 2003. Hoxby (2001b) concluded that public schools benefitted from competition and as a result increased achievement. One concern raised by Hoxby (2003) regarded the measuring of the effects of funding on achievement through indications that low-performing students were migrating to the charters, and, as a result, potential attempts to validate the effects of funding may be skewed.

Hoxby (2004a, 2004b) and Hoxby and Kuziemko (2004) specifically analyzed the differences in achievement and funding between charter schools and traditional public schools. Hoxby (2003) was criticized for concerns regarding valid research parameters. In response to this concern, Hoxby (2004a) was conducted using national data bases, and compared charter schools with neighboring public schools with the same demographics. Hoxby (2004a) concluded that charter school students had higher rates of achievement than they otherwise would have if they had remained in the traditional public school setting. Hoxby and Kuziemko (2004) determined that students who begin charter school in elementary have an increase of six national percentile points higher in math and reading. With Hoxby (2004a) and Hoxby and Kuziemko (2004) research, evidence was articulated that a difference in achievement was evident between traditional public schools and charter schools on a national scale.

Implications for Texas School Finance and Achievement

The correlations between school funding and student achievement continue to persist as a topic of debate in the State of Texas among charter schools, independent school districts, and the state legislature (Booker, Gilpatric, Gronberg, & Jansen, 2008; Clark, 2000; Hoxby, 2004a). Numerous research articles and books investigate and present information to assist interested parties in furthering their understanding of the implications of funding on achievement (Adnett & Davies, 2002; Hanushek & Jorgenson, 1996; Hoxby, 2004b; Peterson & Hassel, 1998; Suh, 2013; Turley, 2009).

Hoxby (2004b) conducted a nationwide comparison study of charter schools and neighboring public schools on reading and math proficiency. The research discovered

students attending charter schools were 5.2% more likely to be reading proficient and 3.2% more likely to be math proficient on their state's exam. Additionally, the longer the charter school was in operation the better the students attending that charter school did on their state assessment over their peers in neighboring public schools (Hoxby, 2004b). Moreover, the findings of Hoxby (2004b) for Texas elementary students in math revealed that the average difference between charter schools and its matched public school in the percentage of students who were proficient (controlling for schools that target at-risk or gifted students) was -6.8% and that difference is statistically significant with a confidence level of 90%.

Hoxby (2004b) concluded that despite only receiving 40% of funding as compared to neighboring schools, charter students measured proficiently in math and reading. Hoxby (2004b) suggested that economically disadvantaged and Hispanic students attending charter schools were more likely to gain academically according to their state test scores. The charter school achievement brought to light the issue of funding.

Conversely, in studying 696 Texas public high schools Turley (2009) found no statistical relationship between per-pupil expenditures and student achievement on the TAKS exit level test, given to 11th grade students. Moreover, Turley (2009) found there was no statistical relationship between per-pupil expenditures and SAT. Suh (2013) concurred for minority student group reporting that equitable funding between schools across the nation had little to no change in the achievement gap.

These findings lack consistency and leave doubt as to the connections of funding and achievement. One thing, however, is certain: Texas does not fund charters in the same way it funds independent school districts.

Texas School Finance Model: Charter and Public School Revenue

According to a national study on charter schools finance, Texas does not contribute to facility cost of charter schools in their per pupil allocation, also known as average daily attendance (ADA) (Nelson, Muir, & Drown, 2000). Although the state of Texas does provide additional funding to charter schools and independent school districts for at-risk students, the funding is based on the students' attendance or ADA, and therefore offsets the at-risk funding due to the lower attendance of at-risk students (Nelson et al., 2000). The result of this type of funding is that schools serving at-risk populations receive less funding because of attendance practices commonly associated with at-risk student populations (Hurst, 2003). Finally Texas charter schools do not receive facilities funding. The Texas school funding model is complex and is explained in the next section.

Texas School Funding Model: Foundation School Program (FSP)

According to the Texas Education Agency Office of School Finance (2010) finances for Texas public school comes from three main sources: local school district property taxes, state funds, and federal funds. This system is known as the Foundation School Program (FSP). The bulk of school funding comes from local property taxes and state funding.

The FSP was created to determine the amount of state and local funds that were due to districts under the Texas school finance laws. The FSP was designed to make sure all Independent school districts receive, "substantially equal access to similar revenue per student at similar tax effort, considering all state and local tax revenues of districts after acknowledging all legitimate student and district cost differences" (Texas Education Code, §42.001(b)). The FSP is comprised of two chief mechanisms: operations and facilities funding. These mechanisms supply financial support for school operations and facilities.

Financing of Texas Independent School Districts

The operations funding mechanism of the FSP provides districts with support in backing their maintenance and operations (M&O) based on three components: Tier I, Tier II and Revenue at the compressed tax rate (Texas Education Agency, 2010-2011).

Tier I of the FSP supplies districts with a, “basic level of funding with allotments for regular education; special education; compensatory education, including Pregnancy Related Services; career and technical education; bilingual / English as a Second Language education; gifted and talented education; and public education grants” (Texas Education Agency, 2010-2011, p. 7). Additional allotments include: “transportation, new instructional facilities, and the Texas Virtual School Network as well as an allotment for specialized programs at the high school level” (Texas Education Agency, 2010-2011, p. 7).

Tier II of the FSP supplements Tier I. Tier II gives assurance that a precise dollar amount of funding for each student in WADA (weighted average daily attendance), “for

each penny of a district's tax effort above a specified level"(Texas Education Agency, 2010-2011, p. 7).

"Revenue at the compressed tax rate provided for in the property-tax-relief law that was passed in 2006 and modified in 2009" (Texas Education Agency, 2010-2011, p. 7) assures districts a fixed amount of revenue for each student in WADA to pay revenue for a set reduction in each districts local M&O tax rates from rates that were set in 2005 (Texas Education Agency, 2011). Revenue for each district at the compressed tax rate is calculated from the, "state and local M&O revenue a district would have earned had it not lowered its tax rate" (Texas Education Agency, 2010-2011, p. 8). Revenue for each district at the compressed tax rate is the amount of the state's share of a, "district's Tier I entitlement and the revenue from the district's (compressed) M&O tax rate, adjusted for statutory minimum or maximum hold harmless provisions"(Texas Education Agency, 2010-2011, p. 8).

The FSP also provides Independent school districts facility funding by providing assistance for debt service of ISD facilities through the Instructional Facilities Allotment and the Existing Debt Allotment. The Instructional Facilities Allotment and the Existing Debt Allotment attempt to equalize interest and sinking (I&S) funds tax effort (Texas Education Agency, 2010-2011).

Financing of Texas Charter Schools

For operations the FSP provides charter schools Tier I and Tier II funding the same as Independent school districts, however, it is calculated based on state averages unlike Independent school districts. Yet, because charter schools do not have a tax

based they do not receive relief from a compressed tax rate. Unlike independent school districts, the FSP does not provide the instructional facilities allotment and the existing debt allotment to charter school, as a result, “Charter schools are not eligible to receive facilities funding” (Texas Education Agency, 2010-2011, p. 35).

The Effects of Texas Charter Schools Not Eligible for Facility Funding

With charter schools “not eligible to receive facilities funding” (Texas Education Agency, 2010-2011, p. 36) a multiplicative disparity in funding is created between Texas charter schools and independent school districts. Considering the majority of independent school districts fund school facilities projects through “bond issues, paid for over time” (Texas Constitution and Statutes, n.d.c, p. 6) through local interest and sinking fund, Instructional Facilities Allotment or existing debt Allotment (Resource Center for Charter Schools, 2007) charter schools must use operations funds to provide facilities. “This inequity in facilities funding is responsible for over half of the overall under-funding of charter schools” (Resource Center for Charter Schools, 2007).

In the Resource Center for Charter Schools (2007) study of the 2003-04 school year the *Apples to Apples* report found charter schools averaged $1,297 less WADA in revenue than independent school districts of, similar “size and demographics in the same county” (p. 1). Additionally the study revealed that independent school districts, “averaged $675 per student in funding for facilities from local taxes and state aid, for which charter schools had no parallel funding mechanism” (p. 2). Consequently, charter schools had to use their operating allotment to pay for facility expenditures.

This limits the charter schools more than the independent school districts

because the independent school districts obtain more state funding per pupil than that of a charter school district. Therefore, considering that, “Students’ achievement generally does rise when they attend voucher or charter schools” (Hoxby, 2003, p. 11) charter schools began to make the argument for equality in state funding.

Texas Finance Policies and At-Risk Student Populations

Harter’s (1999) research was in response to continued conversations and debates as to whether there is a relationship between school spending and student performance. Harter (1999) examined over 2,800 elementary schools in Texas and used a micro-analysis approach of school finance and student performance. Harter (1999) conducted a micro-analysis of student performance that considered student achievement with math and reading variables, academic potential of marginalized students, socioeconomic background, and school location and size.

While both math and reading were positively correlated, a significant result from the expenditure variable is found in the “positive relationship between spending for teachers’ career ladder supplement and achievement in both math and reading” (Harter, 1999, p. 293). Other positive significant findings were “High Gifted” and “Spending for regular school upkeep” (Harter, 1999, p. 294). One interesting find was that location (i.e., major suburb, city, city suburb, town and growth are) was not a statistically significant factor because they were all positively correlated. There were also some significant findings in a strong negative relationship between expenditures and student achievement. Expenditures on substitute teachers had a large negative on student achievement. Couple this negative finding with the positive finding of expenditures on

teachers' career ladder supplement, and we learn that school resources spent on quality teachers provides a higher student achievement than expenditures on temporary teachers. Strong negative findings were identified in at-risk, Black, disadvantaged and chapter 1 students in both math and reading.

Harter (1999) discovered that low poverty schools rated "at or below the median level for all schools in the sample" (Harter, 1999, p. 297). On the contrary, high poverty schools are above the median level for all schools in the sample. Harter (1999) also revealed few significant results for low poverty schools such as "expenditures for teachers' salary supplement and for regular school upkeep still show a strong positive association with performance" (p. 297). Harter (1999) discovered that low poverty student performance is not affected by school location and size.

Harter (1999) concluded that in high poverty schools none of the spending related negatively to student achievement. However, there was a strong positive relationship between the expenditures for teachers' salary supplement and school upkeep and student performance. Harter (1999) stated that the "results suggest that higher poverty schools are particularly susceptible to the ineffective use of resources" (p. 300).

Both analyses, the full sample and the low vs. high poverty sample, show that spending for teacher salary supplement, school supplies and school upkeep are vitally important for student achievement. Harter (1999) concluded that "the results indicate that differences in relatively small amounts of school expenditures can account for some of the variation in student achievement between schools" (p. 300). Equally important is the divulgence of expending school funds on substitute teachers, support personnel,

and guidance services is related to lower student performance. As indicated above, these negative relationships are more pronounced in the schools with a higher percent of economically disadvantaged students. In conclusion, Harter (1999) revealed that “the results indicate that the relationship between school expenditures and student achievement depends on how money is spent” (p. 300).

CHAPTER 3

METHODOLOGY

This study explored whether there was a relationship between student achievement and per pupil expenditure of public funds on elementary schools in independent school districts and charter schools in the state of Texas that serve greater than or equal to 50% of economically disadvantaged students. Litigation between the Texas Taxpayer Student Association and Michael Williams, the Commissioner of Education for the state of Texas, found that the states' current school finance system violated its state constitution and the funding system was inefficient and not equitable (Texas Taxpayer & Student Fairness Coalition et al. v. Michael Williams et al., 2013). Both school funding mechanism and student achievement standards have risen over time (Godwin & Kemerer, 2002; Hoxby, 2004a; Pan, Rudo & Smith-Hansen, 2003; Cuomo, 2010; Duncan, 2010; Freeman, 2010; Baker, 2012) forcing schools to provide all students an adequate education (No Child Left Behind, NCLB 2002) or else face being penalized by the state and federal governments (Henley, 2008).

Considering per pupil expenditures have increased over the last several years (Baker, 2012) the relationship between educational spending and student achievement had to be investigated. According to the U.S. Department of Education per pupil expenditures increased by $1,892 from 1999-2000 when the average per pupil expenditure was $9,292 to $11,184 in 2009-2010 (Wilkinson-Flicker, Kristapovich, Rathbun, Wang, & Zhang, 2013). While per pupil expenditures have risen by over two percent over the last 20-30 years Scholastic Aptitude Test (SAT®) scores have remained statistically flat (Snyder & Dillow, 2012). Considering these facts, politicians,

businessmen and educators continue to ask pertinent questions as to whether or not greater per pupil expenditures lead to greater student achievement.

Research Questions

The literature review suggested there were still unanswered questions concerning the differences between per pupil expenditures and student achievement for elementary schools in independent school districts and charter schools in the state of Texas that serve greater than or equal to 50% of economically disadvantaged students. The research questions for this study were:

1. What is the difference in student achievement between elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged?
2. What is the difference in per-pupil expenditure of public funds between elementary school in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged?
3. What is the relationship between student achievement and per-pupil expenditure of public funds on elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged?

Research Design

The design of this quantitative study was an ex post facto cross-sectional analysis that used the production function theory. The study was cross-sectional analysis in that it captured an understanding of educational spending and student achievement at a single moment in time (Turley, 2009). The study was ex post facto in that it was conducted after the variables had already been captured for other purposes. The data collected and analyzed was from the 2010-2011 Academic Excellence Indicator System (AEIS) report. The theory of production function was utilized to determine if student test scores and production were a result of the level of expenditures behind them function.

Participants

The sample comprised of 1469 independent school districts containing elementary schools with a rate of greater than or equal to 50% economically disadvantaged students and 38 charter school districts containing elementary schools with a rate of greater than or equal to 50% economically disadvantaged students in the state of Texas. The demographics of participants included: 73.24% Hispanic in ISD's and 58.28% in charters, 5.58% of the participants were white in charters while they accounted for 9.73% in ISD's, special education students represented 5.26% in charter schools and 7.87 in ISD's, at-risk students accounted for 62.27% in ISD's compared to 50.47% in charters and ISD's had a rate of 86.67% of students with SES indicators while charters had 91.30%.

Variables Examined/Instrumentations

The model consisted of elementary schools in independent school districts, and charter schools in the state of Texas. Dependent and independent variables were inspected in order to answer each of the research questions posed in this moderated multiple linear regression study.

Dependent Variables

1. Student Achievement, Section 1 page 2 of each school's AEIS report, percent passing reading and mathematics of the TAKS test at the 3rd, 4th and 5th grades during the 2010-2011 school year.
2. State Funding, Section 2 page 4 of each school's AEIS report entitled actual operating expenditure information: by function: Total operating expenditures: per pupil expenditures for instruction and total operating.

Independent Variables

1. Charter elementary schools with a greater than or equal to 50% economically disadvantaged students, Section 1 page 2 of each school's AEIS report, percent passing reading and mathematics of the TAKS test at the 3rd, 4th and 5th grades during the 2010-2011 school year.
2. Independent school district elementary schools with a greater than or equal to 50% economically disadvantaged students, Section 1 page 2 of each school's AEIS report, percent passing reading and mathematics of the TAKS test at the 3rd, 4th and 5th grades during the 2010-2011 school year.

Data was coded by numbers generated by the TEA representing the county in which the school district is located, and the district code and the school code. The data is also accessible by district and school name.

Procedures

This study examined the difference in student achievement between Texas elementary independent school districts and Texas elementary charter schools who serve an economically disadvantaged student population who was greater than or equal to 50%. Next, the study examined the difference in per pupil expenditure of public funds between Texas elementary independent school districts and Texas elementary charter schools who served an economically disadvantaged student population who was greater than or equal to 50%. Once these two analyses were completed, then a comparative analysis, a moderated multiple linear regression equation, between Texas elementary independent school districts and Texas elementary charter schools who serve an economically disadvantaged student population who is greater than or equal to 50% was produced to determine if there was a statistically significant relationship.

For Research Question 1, data regarding student academic achievement was taken from the AEIS reports by the TEA. Third grade students were assessed in reading and mathematics. Fourth grade students were assessed in reading, mathematics and writing. Fifth grade students were assessed in reading, mathematics and science. Students either did not meet minimum standards, met minimum standards, or met commended standards in each of the content areas. Students who attained commended status on any of the content areas exhibited performance on the

assessment in which 90% or more of the items were answered correctly (Turley, 2009). For the purposes of this study, the only percentage that was taken into consideration was the percentage of students passing reading and mathematics in 3rd, 4th and 5th grades (Texas Education Agency, TEA, 2011).

For Research Question 2, per pupil expenditure was operationally defined as per-pupil expenditure for each Independent School District and Charter school according to data gathered from the AEIS reports provided by TEA. Data regarding educational expenditures was taken from AEIS reports entitled actual operating expenditure information: total operating expenditures and instruction under the campus sector per student, which reported each individual independent school district and charter schools average per-pupil expenditure amount.

Data Analysis

Moderated Multiple Linear Regression

The method of research used for this quantitative cross-sectional, ex post facto study was a multiple linear regression for research questions one and two and a moderated multiple linear regression while assuming and checking for homoscedasticity concurrently employing the production function theory.

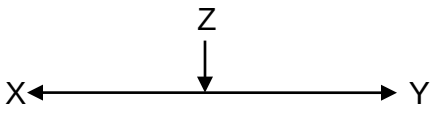
The production function theory allowed the researcher to look through a lens and evaluate the relationship of outputs and inputs (Mishra, 2007). For this research project the inputs were per pupil expenditures that come together multiplicatively to create the product and outputs, which were student achievements. Employing the production function theory allowed the analysis of inputs and outputs to measure the amount of

output for the given quantity of inputs. It is theorized the production, student achievement, is equal to the multiple functions per pupil expenditures of public funds, that multiplicatively come together to create the product. Thus, production function allowed the exploration of linkage between per pupil expenditures of public funds and student performance in order to better understand the role of per pupil expenditures of public funds and effects on student achievement. In addition, researchers Hanushek (1997) and & Waldrip (2008) utilized the production function model with varying forms of multiple linear regression analysis.

A moderated multiple linear regression analysis was employed to explain and predict the variance in interval dependent variables (student achievement) based on interval independent variables (per pupil expenditures). This analysis allowed the exploration of potential causal relationships, interaction effects and helped explain the natural phenomenon among the dependent and independent variables. According to Gall, Gall, & Borg (2007) multiple linear regression analysis is one of the most widely used statistical techniques due to its "versatility and the amount of information it yields about relationships among variables" (p. 353). Multiple regression is flexible enough to allow a researcher to use interval, ordinal or categorical data and provide estimates of magnitude and significance of relationships between variables (Gall et al., 2007).

A moderated multiple linear regression is a regression equation in which one of the independent variables modifies the relationship among the other variable (Cohen, Cohen, West, & Aiken, 2003). In this study, per pupil expenditures were designated as the moderator variable because it moderates the predictive validity of the student's achievement.

For example, in the figure below: X is the student achievement of elementary schools in independent school districts in the state of Texas that serve greater than or equal to 50% economically disadvantaged students; Y is the student achievement of elementary schools in charter schools in the state of Texas that serve greater than or equal to 50% economically disadvantaged students; and, Z is the per pupil expenditure of public funds.



Thus, Z, per pupil expenditures, moderates the relationship between X and Y. Stated differently, X and Y are dependent on Z.

The moderated multiple linear regression equation maintained homoscedasticity. Meeting homoscedasticity ensured the residual errors of the prediction have equal variance for all predicted values of Y (Cohen et al., 2003, p. 674). Also stated, "The variance of the residual around the regression line is assumed to be constant regardless of X" (Cohen et al., 2003, p. 120).

Moderated multiple linear regression is expressed as:

$$Y = b_0 + b_1 \chi_1 + b_2 \chi_2 + b_3 (\chi_1 \times \chi_2) + \varepsilon$$

Y is regressed on X.

In the moderated multiple linear regression analysis the Pearson product-moment correlation is of particular interest. The Pearson product-moment correlation, represented by *r*, is the coefficient after computing the sum of cross-products and dividing by the number, *n*, minus 1 (Hinkle, Wiersma, & Jurs, 2003). "The Pearson product-moment correlation is the mean of the cross-product of scores" (Hinkle et al.,

2003, p. 99).

The Pearson product-moment correlation was utilized to determine the strength of the linear relationship between student achievement (the dependent variable) and per pupil expenditure of public funds (the independent variable) of Texas elementary schools in independent school districts and charter schools who serve an economically disadvantaged student population who is greater than or equal to 50% in the 2010-2011 school year.

Univariate analysis is the most straight forward form of quantitative analysis. The analysis is analyzed describing, i.e., descriptive statistics, only one variable, hence the prefix of the name uni-variate. "Descriptive statistics are the mathematical techniques for organizing and summarizing a set of numerical data" (Gall et al., 2007, p. 132). Descriptive statistics generally include: N (number of items analyzed), measures of central tendency i.e., mean, mode and median and measures of variability; i.e., standard deviation (Gall et al., 2007).

Bivariate analysis, also known as bivariate correlation coefficient, involves two variables, generally X and Y, in order to determine the relationship between them. This statistic mathematically describes the "strength of the relationship between the two variables" (Gall et al., 2007, p. 136) X and Y.

Multivariate analysis also known as MVA and multivariate correlation has three or more variables and is based on the statistical principle of multivariate statistics, which describes and explores the relationship between each of the multiple variables in the analysis. Multivariate correlation allows researchers to mathematically see how the variables interact with one another singularly and collectively and how each affects the

outcome variables (Gall et al., 2007).

This quantitative cross-sectional, ex post facto, moderated multiple linear regression utilized SPSS® version 20 for windows statistical and data management package. The unit of analysis for each research question was elementary schools in independent school district and charter school in the state of Texas. Descriptive statistics were performed which consisted of the mean and standard deviation of each variable and the minimum and maximum student achievement scores and per pupil expenditure dollar amounts, as well as the N, number, were reported.

Summary

The research provided a statistical analysis of the relationship between expenditure of public funds of elementary in independent school districts and charter schools as it relates to student achievement. Reliable data sources were identified and offered the data necessary to complete the study. Specific forms of statistical analysis were aligned to the data to provide the necessary evaluative outcomes to complete the process effectively.

CHAPTER 4

RESULTS

The purpose of this study was to evaluate the relationship between the instructional outcomes in Texas public and charter elementary school campuses to determine the predictive validity of per-pupil expenditures of public funds on the campuses' academic success. Specifically, this study evaluated student achievement data in reading and math and per-pupil expenditures in instruction and total operating expenditures in Texas elementary schools from both charter and independent public school districts, whose total enrollment was greater than or equal to 50% of the total enrollment identified as economically disadvantaged in the 2010-2011 school year. The following research questions guided the current study:

Research Questions

1. What is the difference in student achievement between elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged?
2. What is the difference in per-pupil expenditure of public funds between elementary school in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged ?
3. What is the relationship between student achievement and per-pupil expenditure of public funds on elementary schools in independent public

school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged?

Organization

This chapter is organized by introducing descriptive statistics, bivariate correlations and multiple linear regressions, which were utilized to examine the impact of selected financial variables on student achievement while controlling for student demographic variables. The results, charts and graphs for all analyses are reported below.

Descriptive Statistics

Initially, descriptive measures were employed to examine the reading and mathematics TAKS scores for 3rd, 4th and 5th grade students during the 2010-2011 school year. The participants included 1,469 public schools with an average enrollment of 580 students and 38 charter school elementary campuses with an average enrollment of 370 students. Schools involved in this study reported their enrollment of students identified as economically disadvantaged at 50% or greater. In addition, per-pupil instructional expenditures and total per-pupil operating expenditures were examined.

As displayed in Tables 1 and 2, the average percentage of students passing the TAKS reading and math assessments among charter schools was 74.49% (reading) and 67.89% (math). In comparison, the percentage of students in public elementary

schools passed the TAKS reading and math assessments at an appreciably higher rate. The percentage of public school students passing the TAKS reading assessment was 85.26%, while 85.56% of public elementary school students passed the TAKS math assessment.

Regarding financial expenditures Table 1 revealed, the average total per-pupil operating expenditure among charter elementary schools was $5,300.81 (*SD* = $2,779.02), ranging from a minimum of $2,655 to a maximum of $19,791. In comparison, the total per-pupil operating expenditures among public elementary schools averaged $5,883.46 (*SD* = $3,586.80) ranging from a minimum of $280 to a maximum of $72,459. Furthermore, per-pupil instructional expenditures for elementary schools located in public school districts averaged $4,340.44 (*SD* = $2,401.98) ranging from a minimum of $139 to a maximum of $49,041 compared to charters with an average of $3,635.81 in per-pupil instructional expenditures (*SD* = $1,995.56) ranging from $1,869 to $14,066.

Table 1

Descriptive Statistics for Elementary Schools in Independent Public School Districts

Descriptive Statistics					
	N	Std. Minimum	Maximum	Mean	Deviatio
Total Operating Expenditures	1448	280	72459	5883.46	3586.797
Instructional Expenditures	1448	139	49041	4340.44	2401.984
TAKS_Math	1461	-4	99	85.56	10.758
TAKS_Reading	1461	-4	99	85.26	8.446
SES	1469	70.0	100.0	87.665	8.4390
At-Risk	1469	5.1	100.0	62.270	17.2576
School Type	1469	2	1360	579.67	202.513
White	1469	.0	89.3	9.728	14.1179
African American	1469	.0	97.5	14.698	21.4742
Hispanic	1469	1.8	100.0	73.236	26.1991
SPED	1469	.0	100.0	7.856	4.6122

Table 2

Descriptive Statistics for Elementary Schools in Charter School Districts

Descriptive Statistics					
	N	Minimum	Maximun	Mean	Std. Deviation
Total Operating Expenditures	36	2655	19791	5300.81	2779.021
Instructional Expenditures	36	1869	14066	3635.81	1995.557
TAKS_Math	37	-4	98	67.89	31.520
TAKS_Reading	37	-4	99	74.49	26.785
SES	38	70.1	100.0	91.229	7.5945
At-Risk	38	3.9	100.0	50.466	24.7109
School Type	38	18	901	368.66	220.408
White	38	.0	33.3	5.582	8.4853
African American	38	.0	97.3	33.679	31.5028
Hispanic	38	1.7	99.1	58.237	32.3376
SPED	38	.9	50.0	5.258	7.8303

Bivariate Correlations

Pearson product moment correlations were conducted to assess the relationship between each of the continuous variables. Regarding expenditures, Table 3 revealed overall that there were no statistically significant correlations between reading achievement and total operating per-pupil expenditure and per-pupil instructional expenditure. Additionally, no statistically significant correlations were noted between math achievement and total operating per-pupil expenditure and per-pupil instructional expenditure. However, reading and math were correlated ($r = .638$, $p < .01$) with an effect size of $R^2 = .407$ demonstrating that student performance on the TAKS reading assessment explained 40.7% of the variance in the student performance on the TAKS mathematics assessment. Therefore, increases in student's reading achievement were moderately correlated with increases in student's math achievement. According to Ferguson (2009), an R^2 value of .04 is the proposed minimum effect size corresponding to a "practically significant" effect, while 0.25 is considered a "moderate" effect. In Ferguson's work, an effect size of 0.64 is a "strong" effect size.

Table 3

Bivariate Relationships among Variables (Correlations)

	1	2	3	4	5	6	7	8	9	10	11	12
1 TAKS_Math	1.00											
2TAKS_Reading	.638**	1.00										
3 Total Operating	-.017	.032	1.00									
4 Instruction Expenditures	-.005	.048	.979**	1.00								
5 School Type	-.228**	-.177**	-.025	-.045	1.00							
6 At-Risk	.053**	-.043	.040	.020	-.105**	1.00						
7 SES	-.118**	-.183**	.049	.002	.066*	.500**	1.00					
8 Enrollment	.146**	.055*	-.240**	-.219**	-.161**	.313**	.054*	1.00				
9 White	-.029	.040	-.004	.035	-.046	-.422	-.589	-.286	1.00			
10 African American	-.153**	-.095**	.032	.034	.135**	-.323**	.061**	-.121	-.066	1.00		
11 Hispanic	.141**	.044	-.022	-.048	-.089**	.509**	.305	.242	-.512	-.813**	1.00	
12 SPED	-.128	-.106	.357	.383	-.086	-.166	-.159	-.228	.298	-.009	-.162	1.00

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

Regression Analysis

Research Question 1

What is the difference in student achievement between elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged?

Multiple regression models were constructed to determine the relationship between math achievement and school type while controlling for the percentage of White, Hispanic, At-Risk, Low SES and special education students.

The regression results reported in Table 4 revealed that the percentage of charter school students passing the math TAKS assessment was 16.09% less than their counterparts in elementary schools located in public elementary schools. The 95% confidence intervals ranged from -19.92% to -12.25%, signifying the difference in passing rates between charter and public school elementary campuses was statistically significant as the 95%CI did not include zero (Cohen et al., 2003, p. 497). However, the effect size (R^2) for math achievement was approximately 11%, which is small according to Ferguson (2009). Thus, while the overall model was statistically significant ($F(7, 1490) = 27.438$ $p < .001$) it had little practical significance in predicting student achievement in math TAKS assessment.

Table 4

Coefficient Table of Student Achievement in Math in Charter and Independent School District Elementary Schools

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	*t*	Sig.	Lower Bound	Upper Bound
1	(Constant)	105.335	4.472		23.555	p < .01	96.563	114.107
	At-Risk	.003	.023	.004	.111	.911	-.042	.047
	Low SES	-.265	.048	-.186	-5.548	p < .01	-.359	-.171
	White	-.020	.030	-.023	-.644	.520	-.079	.040
	Hispanic	.059	.014	.129	4.144	p < .01	.031	.087
	SPED	-.349	.067	-.136	-5.225	p < .01	-.481	-.218
	School Type	-16.093	1.955	-.208	-8.233	p < .01	-19.927	-12.259

a. Dependent Variable: TAKS_Math

Results for Student Achievement in Reading in Charter and Independent School District Elementary Schools

A separate linear multiple regression analysis was conducted to determine the relationship between reading achievement and school type while controlling for percent White, Hispanic, at-risk, low SES and special education students. The model had little practical significance as it yielded an $R^2 = .085$, indicating the overall model accounted for approximately 8.5% of the variance in reading achievement of elementary schools located in public elementary school and charter elementary schools. While the overall model accounted for 8.5% of the variance in reading achievement, the model was statistically significant ($F(7, 1490) = 20.862$, $p < .001$).

The regression reported in Table 5 revealed 10.64% fewer students in elementary charter schools passed the TAKS reading assessment in comparison to their counterparts in public school elementary campuses.

Table 5

Coefficient Table of Student Achievement in Reading in Charter and Independent School District Elementary Schools

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for *B*	
		B	Std. Error	Beta	*t*	Sig.	Lower Bound	Upper Bound
1	(Constant)	109.021	3.574		30.507	p < .01	102.011	116.031
	At-Risk	-.013	.018	-.023	-.698	.485	-.048	.023
	Low SES	-.252	.038	-.224	-6.595	p < .01	-.327	-.177
	White	-.023	.024	-.034	-.938	.348	-.070	.025
	Hispanic	.025	.011	.070	2.206	.028	.003	.047
	SPED	-.289	.053	-.143	-5.412	p < .01	-.394	-.184
	School Type	-10.635	1.562	-.174	-6.808	p < .01	-13.699	-7.571

a. Dependent Variable: TAKS_Reading

Summary of Research Question 1

Research Question 1 examined the difference in math and reading student achievement between elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged. The results revealed a small to negligible effect size for math and reading achievement (math achievement R^2 = .110, reading achievement R^2 = .085). The findings suggest additional variables not considered in the current study may be better predictors of student reading and math achievement than those included in the above models.

Research Question 2

Results for Per-pupil Instructional Expenditures in Charter and Independent School District Elementary Schools Model Summary

What is the difference in per-pupil expenditure of public funds between elementary school in independent public school districts and charter schools in the state of Texas that serve greater than or equal to 50% economically disadvantage students?

Multiple regression analysis was conducted to determine the relationship between per-pupil instructional expenditures and school type while controlling for percent of White, Hispanic, At-Risk, Low SES, special education students and student achievement. The overall model was statistically significant, ($F(9, 1466) = 153.582$ $p < .001$), and yielded an $R^2 = .482$, demonstrating the overall model explained approximately 48.2% of the variance in instructional expenditures.

The regression reported in Table 6 revealed that charter schools spent $7.54 more on per-pupil instructional expenditures than their counterparts in elementary schools located in elementary schools. However, the results were not statistically significant revealing no real difference in expenditure by campus type. In addition, 95% confidence interval ranged from -$297.10 to $312.17, meaning the difference in per-pupil instructional expenditures between charter and public school elementary campuses was not statistically significant as the 95% confidence interval included zero (Cohen et al., 2003, p. 497).

Table 6

Coefficient Table of Per-pupil Instructional Expenditures in Charter and Independent School District Elementary Schools

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
	B	Std. Error	Beta	*t*	Sig.	Lower Bound	Upper Bound
1 (Constant)	2891.676	442.510		6.535	$p < .01$	2023.656	3759.696
At-Risk	14.404	1.736	.210	8.298	$p < .01$	10.999	17.809
Low SES	-10.703	3.747	-.075	-2.856	.004	-18.053	-3.352
White	-13.314	2.337	-.155	-5.697	$p < .01$	-17.899	-8.730
Hispanic	-5.450	1.106	-.119	-4.926	$p < .01$	-7.619	-3.280
SPED	209.055	5.976	.701	34.985	$p < .01$	197.333	220.776
School Type	7.536	155.299	.001	.049	.961	-297.095	312.168
TAKS_Math	-.394	2.496	-.004	-.158	.875	-5.290	4.501
TAKS_Reading	6.774	3.151	.052	2.150	.032	.593	12.956

a. Dependent Variable: Per-pupil Instructional Expenditures

Results for Total Operating Per-pupil Expenditures in Charter and Independent School District Elementary Schools

Multiple regression analysis was conducted to determine the relationship between total operating per-pupil expenditures and school type while controlling for percent of White, Hispanic, At-Risk, Low SES, special education students and student achievement. The model was statistically significant, ($F(9, 1466) = 163.936$ $p < .001$), and yielded an $R^2 = .499$, indicating the overall model explained approximately 49.9% of the variance in total operating expenditures.

The regression reported in Table 7 revealed charter schools spent $293.85 more on total operating per-pupil expenditures than their counterparts in elementary schools located in elementary schools, yet the difference in expenditures was not statistically significantly different. Further, the 95% confidence intervals ranged from $-125.05 to

$712.74, further verifying the difference in total operating per-pupil expenditures between charter and public school elementary campuses was not statistically significant.

Table 7

Coefficient Table of Total Operating Per-pupil Expenditures in Charter and Independent School District Elementary Schools

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	*t*	Sig.	Lower Bound	Upper Bound
1	(Constant)	3449.621	608.491		5.669	p < .01	2256.015	4643.226
	At-Risk	19.161	2.387	.200	8.027	p < .01	14.478	23.843
	Low SES	-7.258	5.153	-.036	-1.408	.159	-17.366	2.850
	White	-25.973	3.214	-.216	-8.081	p < .01	-32.277	-19.668
	Hispanic	-6.491	1.521	-.102	-4.267	p < .01	-9.474	-3.507
	SPED	295.576	8.217	.709	35.971	p < .01	279.457	311.694
	School Type	293.845	213.550	.027	1.376	.169	-125.051	712.741
	TAKS Math	.350	3.432	.002	.102	.919	-6.382	7.082
	TAKS Reading	8.930	4.333	.049	2.061	.040	.429	17.430

a. Dependent Variable: Total Operating Per-pupil Expenditures

Summary of Research Question 2

Research Question 2 examined the difference in per-pupil instructional expenditures and total operating per-pupil expenditures between elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged. Multiple regression results revealed a moderate effect size (Ferguson, 2009) for the statistically significant model for per-pupil instructional expenditures and total operating per-pupil expenditures (per-pupil instructional

expenditures R^2 = .482, total operating per-pupil expenditures R^2 = .499). However, the resulting t-test and 95% confidence intervals for per-pupil instructional expenditures and total operating per-pupil expenditures revealed the difference in expenditures between charter and public school elementary campuses was not statistically significant.

Research Question 3

Results for Mathematical Student Achievement and Per-pupil Instructional Expenditures in Charter Elementary Schools

What is the relationship between student achievement and per-pupil expenditure of public funds on elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged?

A multiple regression analysis was conducted to determine the relationship between charter elementary schools mathematical student achievement and per-pupil instructional expenditures while controlling for the percentage of White, Hispanic, At-Risk, Low SES and special education students. The model was statistically significant, ($F(7, 28) = 6.165$ $p < .001$), and yielded an R^2 = .508, signifying the model accounted for approximately 50.8% of the variance in TAKS math achievement.

The regression results indicated suggest charter elementary school per-pupil instructional expenditures did not statistically significantly predict mathematical student achievement. Table 8 revealed that as charter elementary school per-pupil instructional expenditures decreased by one unit, ($1), mathematical student achievement decreased -.002% with a lower and upper bound 95% confidence interval ranging from -.01% to .01%,

Table 8

Coefficient Table of Mathematical Student Achievement and Per-pupil Instructional Expenditures in Charter Elementary Schools

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	*t*	Sig.	Lower Bound	Upper Bound
1	(Constant)	221.066	48.413		4.566	$p < .01$	121.898	320.235
	At-Risk	-.331	.214	-.256	-1.546	.133	-.770	.108
	Low SES	-2.130	.550	-.489	-3.876	.001	-3.256	-1.005
	White	-.142	.535	-.039	-.265	.793	-1.238	.954
	Hispanic	.519	.140	.529	3.694	.001	.231	.807
	SPED	1.623	1.309	.412	1.240	.225	-1.058	4.304
	Instructional Expenditures	-.002	.005	-.096	-.306	.762	-.012	.009

a. Dependent Variable: TAKS_Math

Results for Mathematical Student Achievement and Per-pupil Instructional Expenditures in Independent School District Elementary Schools

A multiple regression analysis was conducted to determine the relationship between independent school district elementary schools mathematical student achievement and per-pupil instructional expenditures while controlling for percent of White, Hispanic, At-Risk, Low SES and special education students. The model was not statistically significant, ($F(7, 1432) = 6.765$ $p < .001$), and yielded an R^2 value of .027, denoting the model accounted for approximately 2.7% of the variance in mathematical achievement in public elementary campuses.

The regression reported in Table 9 revealed that as independent school district elementary schools per-pupil instructional expenditures increased by one unit, ($1), mathematical student achievement increased by less than one percent with the 95% confidence interval ranging from .000 to .001, suggesting independent school district

elementary school per-pupil instructional expenditures did not statistically significantly predict mathematical student achievement.

Table 9

Coefficient Table of Mathematical Student Achievement and Per-pupil Instructional Expenditures in Independent School District Elementary Schools

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	*t*	Sig.	Lower Bound	Upper Bound
1	(Constant)	96.556	4.490		21.505	P < .01	87.748	05.363
	At-Risk	.003	.022	.005	.138	.890	-.040	.046
	SES	-.182	.046	-.145	-3.981	p < .01	-.271	-.092
	White	-.005	.029	-.007	-.190	.849	-.062	.051
	Hispanic	.043	.014	.107	3.173	.002	.017	.070
	SPED	-.268	.100	-.098	-2.669	.008	-.465	-.071
	Instructional Expenditures	.000	.000	.055	1.570	.117	.000	.001

a. Dependent Variable: TAKS_Math

Results for Reading Student Achievement and Per-pupil Instructional Expenditures in Charter Elementary Schools

A multiple regression analysis was conducted to determine the relationship between charter elementary schools reading student achievement and per-pupil instructional expenditures while controlling for percent of White, Hispanic, At-Risk, Low SES and special education students. The model was statistically significant, ($F(7, 28) = 2.686$ $p < .001$), and yielded an $R^2 = .252$, meaning the model accounted for approximately 25.2% of the variance among all the variables.

The regression indicated charter elementary school per-pupil instructional expenditures could not statistically significantly predict reading student achievement.

Evidenced as Table 10 revealed that as charter elementary school per-pupil instructional expenditures increase by one unit, $1, reading student achievement decreased by -0.08% with a lower and upper bound range of -.018% and .003%.

Table 10

Coefficient Table of Reading Student Achievement and Per-pupil Instructional Expenditures in Charter Elementary Schools

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	*t*	Sig.	Lower Bound	Upper Bound
1	(Constant)	170.871	50.842		3.361	p < .05	66.725	275.017
	At-Risk	.109	.225	.099	.483	.633	-.352	.570
	Low SES	-1.156	.57	-.312	-2.003	.055	-2.339	.026
	White	-.759	.562	-.244	-1.350	.188	-1.909	.392
	Hispanic	.205	.147	.245	1.389	.176	-.097	.507
	SPED	2.071	1.375	.617	1.506	.143	-.745	4.887
	Instructional Expenditures	-.008	.005	-.563	-1.453	.157	-.018	.003

a. Dependent Variable: TAKS_Reading

Results for Reading Student Achievement and Per-pupil Instructional Expenditures in Independent School District Elementary Schools

A multiple regression analysis was conducted to determine the relationship between independent school district elementary schools reading student achievement and per-pupil instructional expenditures while controlling for percent of White, Hispanic, At-Risk, Low SES and special education students. The model was statistically significant, ($F(7, 1432) = 8.764$ $p < .001$), and yielded an $R^2 = .036$, indicating the model accounted for approximately 3.6% of the variance among all the variables.

The regression reported in Table 11 revealed that as independent school district total per-pupil instructional expenditures increase by one unit, $1, reading student

achievement increases by 0.01% with a lower and upper bound range of .00% and .00% suggesting independent school district elementary school per-pupil instructional expenditures could not statistically significantly predict reading student achievement.

Table 11

Coefficient Table of Reading Student Achievement and Per-pupil Instructional Expenditures in Independent School District Elementary Schools

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	*t*	Sig.	Lower Bound	Upper Bound
1	(Constant)	97.783	3.458		28.281	$p < .01$	91.001	104.566
	At-Risk	-.031	.017	-.065	-1.826	.068	-.064	.002
	Low SES	-.162	.035	-.167	-4.608	$p < .01$	-.231	-.093
	White	.005	.022	-.009	.240	.810	-.038	.049
	Hispanic	.023	.011	.073	2.185	.029	.002	.044
	SPED	-.221	.077	-.105	-2.861	.004	-.373	-.070
	Instructional Expenditures	-.001	.000	.128	3.638	$p < .01$	-.000	.001

a. Dependent Variable: TAKS_Reading

Summary of Research Question 3

Research Question 3 examined the difference between student achievement and per-pupil expenditure of public funds on elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged. Multiple regression results revealed charter elementary school per-pupil instructional expenditures did not statistically significantly predict mathematical or reading student achievement. Nor did public elementary school per-pupil instructional expenditures statistically significantly predict mathematics and reading student achievement.

CHAPTER 5

SUMMARY, RESULTS, CONCLUSIONS AND RECOMMENDATIONS

This chapter provides an overview of this study. The research problem is reiterated, followed by a review of the methodology, and summary of results. The results are discussed and include interpretation of the findings focusing on the three research questions. This section also includes recommendations for further study, and conclusions. Recommendations and conclusions are based on the results of this study and previous research.

Overview of the Study

Problem Statement

This study addressed whether or not school expenditures predicted student achievement in math and reading in Texas independent public school districts and charter elementary schools whose school population maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged. Although the issues of school funding, expenditures and student achievement have been researched and debated prior to NCLB, since the passing of NCLB concerns regarding school finance and academic achievement have been renewed (Baker, 2012; Beggs, 2013; Bohte, 2004; Borman & Dowling, 2010; Duncan, 2010; Gates, 2011; Hoxby & Kuziemko, 2004; Odden, 2003; Pan et al., 2003; Simpson et al., 2008; Turley, 2009). According to NCLB (2002) all students are expected to reach academic standards regardless of socioeconomic, at-risk, or learning disability status.

Both charter and traditional public schools are held to the same achievement

standards, but traditionally approach spending differently. This study considered the differences in spending and achievement in charter and traditional public elementary schools in Texas who whose school population maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged.

Literature Review

A review of the literature was conducted in order to provide an understanding of: Historical context of school finance student achievement, recent responses to school finance and student achievement, charter school and traditional public school comparisons, Texas school finance model and Texas school funding model for the foundation school program.

Research Questions

The study was guided by three research questions:

1. What is the difference in student achievement between elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged?
2. What is the difference in per-pupil expenditure of public funds between elementary school in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged?

3. What is the relationship between student achievement and per-pupil expenditure of public funds on elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged?

Methodology and Results

Moderated Multiple Linear Regression

The method of research used for this quantitative cross-sectional, ex post facto study was a moderated multiple linear regression while assuming and checking for homoscedasticity concurrently employing the production function theory.

The production function theory allowed the researcher to look through a lens and evaluate the relationship of outputs and inputs (Mishra, 2007). For this research project the inputs were per pupil expenditures that come together multiplicatively to create the product and outputs, which were student achievements. Employing the production function theory allowed the analysis of inputs and outputs to measure the amount of output for the given quantity of inputs.

A moderated multiple linear regression analysis was employed to explain and predict the variance in interval dependent variables (student achievement) based on interval independent variables (per pupil expenditures). Multiple regression is flexible enough to allow a researcher to use interval, ordinal or categorical data and provide estimates of magnitude and significance of relationships between variables (Gall et al., 2007).

The moderated multiple linear regression equation maintained homoscedasticity. Meeting homoscedasticity ensured the residual errors of the prediction have equal variance for all predicted values of *Y* (Cohen et al., 2003, p. 674). This quantitative cross-sectional, ex post facto, moderated multiple linear regression utilized SPSS® version 20 for windows statistical and data management package. The unit of analysis for each research question was elementary schools in independent school district and charter school in the state of Texas. Descriptive statistics were performed which consisted of the mean and standard deviation of each variable and the minimum and maximum student achievement scores and per pupil expenditure dollar amounts, as well as the N, number, were reported.

Summary by Research Question

Research Question 1: What is the difference in student achievement between elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged?

The difference in student achievement between elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged students is small to negligible for the statistically significant model for math and reading achievement (math achievement $R^2 = .110$, reading achievement $R^2 = .085$). These results are not usable for practical purposes and no inferences should be made from them.

Research Question 2: What is the difference in per-pupil expenditure of public funds between elementary school in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged?

There is no statistically significant difference in per pupil expenditure of public funds between elementary school in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged students.

Research Question 3: What is the relationship between student achievement and per-pupil expenditure of public funds on elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged?

The is no statistically significant relationship between student achievement and per pupil expenditure of public funds on elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged students.

Recommendation for Further Study

Although this study added to the body of research on student achievement and per pupil expenditures for Texas elementary schools with high SES populations, further research is needed to add depth and provide a more widespread understanding of per pupil expenditures and their effect on student achievement between independent public

school districts and charter schools. The general public, business leaders and political leaders are looking for the biggest bang for their educational buck. As Bill Gates argued, “The history of education is that over the last 20 years the spending has gone up and it has nearly doubled the per-pupil expenditure,” while student achievement measured through standardized scores had remained fairly flat, concluding, “it’s a big investment and yet the outcomes have not changed that much” (Gates, 2011). In 2011, the Governor of Florida, Rick Scott, said, “We’re spending a lot of money on education, and when you look at the results, it’s not great” (Baker, 2012, p. 1). In Texas District Judge John Dietz ruled the Texas school finance system, “fails to provide substantially equal access to revenues necessary to provide a general diffusion of knowledge” (Texas Taxpayer Student Fairness Coalition et al. v. Michael Williams et al., 2013, p. 1) and clarified, “It is inefficient, inequitable and unsuitable” (Texas Taxpayer Student Fairness Coalition et al. v. Michael Williams et al., 2013, p. 3).

Future studies should consider expanding the per pupil expenditure variables to include all subset variables reported in the AEIS report. Also, in order to assess all of the financial comparison issues between independent public school districts and Charter schools revenue needs to be researched. For example, charter schools do not have a tax base and therefore do not receive maintenance and operation revenue. However, many charter schools have fund raising organizations that contribute to them, while many independent public school districts do not have this benefit. Furthermore, both independent public school districts and charter schools receive federal funds and those funds need to be taken into consideration as well.

Conclusions

The variables of charter elementary schools and independent public school district elementary schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged students did not reveal a statistically significant difference in student achievement as measured by the TAKS test for the 2010-2011 school year. Also, the financial variables (total operating and instructional per pupil expenditures) did not reveal a statistically significant difference in the per pupil expenditure of those funds between elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged students. Finally, there was no statistical relationship found between student achievement and per pupil expenditure of public funds on elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged students. Consequently, the researcher deduced that there was no difference in student achievement or per pupil expenditure of public funds between charter and independent public school district elementary schools. Furthermore, there was no relationship between educational expenditures and student achievement on charter and independent public school district elementary schools. Moreover, educational expenditures did not have any predictive value when it came to student achievement on the standardized TAKS test scores.

The implications were enormous considering the amount of resources expended attempting to determine whether school funding models are constitutional or not (Texas

Taxpayer Student Fairness Coalition et al. v. Michael Williams et al., 2013). Therefore, lawmakers and stake holders must contemplate this when constructing policy regarding school funding. The literature underscored the need for additional research to better understand the relationship between expenditures and achievement in both traditional and charter public schools (Waldrip, 2008, p. i) of which this study fulfilled. The findings of this study were supported by prior research efforts regarding educational expenditures and student achievement (Coleman, 1966; Pan et al., 2003; Suh, 2013; Turley, 2009) and add to the body of literature concerning the differences between charter schools and traditional public schools.

Summary

This chapter provided a comprehensive overview of this study. The research showed that there was no statistically significant difference between elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged students in student achievement, as measured by the TAKS test for the 2010-2011 school year, nor in the per pupil expenditure of funds. There was no statistical relationship found between student achievement and per pupil expenditure of public funds on elementary schools in independent public school districts and charter schools in the state of Texas that maintain total student enrollment where 50% or more of the total enrollment is identified as economically disadvantaged students. Prior research, such as Pan et al. (2003) was supported by this study

concluding that there was no statistical relationship between student achievement and educational expenditures.

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