THE RELATIONSHIP BETWEEN THE CONDITION OF SCHOOL FACILITIES AND CERTAIN EDUCATIONAL OUTCOMES, PARTICULARLY IN RURAL PUBLIC HIGH SCHOOLS IN TEXAS

by

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To God be all the glory!

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ABSTRACT

If the condition of facilities in some schools is such that the schools cannot provide a quality education for its students equal to that of other schools, then equal educational opportunity may not be available for all children. The purpose of this study was to examine the relationship between the condition of rural public high school facilities in Texas and student achievement, student attendance, and teacher turnover.

The measures for the condition of facilities variables used in this study were obtained from the 2006 Texas Comptroller's Facility Survey of the 1,037 public school districts in Texas. The participants for this study were the 72 rural public high schools out of the 309 total responses to the survey from all district types. Multiple regression analyses were utilized to examine which selected condition of facilities variables and demographic variables best predicted certain educational outcomes.

This study found that the student wealth level contributed most to the variance in student achievement. However, the condition of school facilities has a measurable effect over and above socioeconomic conditions on student achievement and teacher turnover. Significant findings with regard to condition of school facilities included:

1. Rural public high schools with a large percentage of portable classrooms have lower student achievement and higher teacher turnover. For every 10 percent reduction in the percent of portable square feet per student of school facilities, the average TAKS scores increased by 11.38 points and the average years of teacher experience with the district increased by 2.32 years.
2. Rural public high schools with a large percentage of deferred maintenance in their facilities have lower student achievement. For every additional 10 percent

addition of deferred maintenance of school facilities, the average TAKS scores decreased by 0.61 points.

School leaders are not able to control the socioeconomic conditions of the students they serve. The do, however, have some control over the quality of their school facilities. Excellent facilities for children who need them the least and inadequate facilities for the ones who need them the most violates the principal of equal educational opportunity for all children.

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CHAPTER I

INTRODUCTION AND PROBLEM STATEMENT

Introduction

The mission of public education in Texas is to "ensure that all Texas children have access to a quality education that enables them to achieve their potential and fully participate now and in the future in the social, economic, and educational opportunities of our state and nation" (Texas Education Code, Section 4.001). Quality school facilities for the privileged and inadequate school facilities for the disadvantaged undermine the mission of the Texas Education Code. The condition of school facilities is important to the degree that it affects certain educational outcomes.

Americans have traditionally embraced the belief that public education for all children is necessary for a free, democratic society. Equal educational opportunity is necessary to level the playing field for all children. However, generally, there is a disparity in the overall condition of school facilities between high-wealth schools and low-wealth schools. All children should have the same educational opportunities to become productive citizens regardless of race or socioeconomic condition of the students.

The vision of the original Common School Movement stressed the need for a public school system that "generates the informed citizenry needed for democratic government, embraces the welfare of all children in the nation, upholds the ideal of equal opportunity, and stresses the belief that public education can and should provide a level playing field" (Biddle & Berliner, 2002, p. 30). Horace Mann, known as the Father of American Public Education, promoted education as a natural right for every child. Mann believed in "the

existence of a great, immortal, immutable principle…which proves the absolute right to an education of every human being that comes into the world, and which, of course, proves the correlative duty of every government to see that the means of that education are provided for all" (Mann, 1846, p. 2).

Education has long been considered the great equalizer, providing equal opportunities for all students. However, education may be the great un-equalizer for low-income and minority children if they are educated in dilapidated facilities. The quality of school facilities says something about how the community feels about education. One study noted that the school is a "physical representation of a public message about the value of education" (Cash, 1993, p. 83). In the new era of accountability, educational leaders must explore all factors that affect student achievement. Students spend most of their educational career inside school facilities. Therefore, the condition of school facilities should be studied to see if there is a relationship between the condition of school facilities and student achievement.

Statement of the Problem

Many people believe that education and learning can happen anywhere. These people believe that place does not matter. They would say that a good teacher can teach students no matter what the setting. Although there is some validity to these statements, researchers are beginning to find that place does matter. If the condition of school facilities contributes to a positive learning environment for students and a positive working environment for the faculty and staff, the condition of school facilities will become an important consideration for educational leaders and policy makers.

Schools in rural communities face greater challenges with school facilities funding than schools in non-rural communities. Rural districts are in communities with small populations, tax bases that are often inadequate, and regulatory limits to their debt. These factors restrict their capacity to support bonds that fund facilities upgrades. This over-reliance on local property values may be the single most significant reason for inequities in school facilities funding. Schools with greater property value will be able to raise more revenue with less effort than schools with lower property values (Pool, 1993).

Since 1983, when the landmark report, *A Nation at Risk*, was released, school reform has been at the top of the national agenda (Kozol, 1991). Recent reform efforts and effective schools research recommend instructional changes, but hardly mention school facility changes. Packer (2008) estimates that by 2009, the federal funding shortfall for NCLB will be over $85 billion. Without the resources to improve the classroom environment through school repair and modernization, teachers and students will not have the educational environment to provide a quality education for all students. This study adds to the body of research literature by exploring the relationship between the condition of school facilities and certain educational outcomes, particularly in rural high schools.

Significance of the Study

Educational leaders have vast responsibilities as well as opportunities to serve the communities that have entrusted them with leading their schools. This study is important, because knowledge about the relationship between the condition of school facilities and educational outcomes will benefit educational leaders in determining the appropriate educational environment for students in the school district.

This study is important to study the relationship between the condition of school facilities and student outcomes, because Texas is constantly being confronted with the threat of litigation over equity issues. The over-reliance on local property taxes has long been known to contribute to school funding inequities. Texas relies heavily on local property taxes to fund capital outlay. Public schools in Texas have brought a series of lawsuits against the state of Texas with regard to school funding issues, some of which specifically included school facilities funding (Clark, 2001). This study revealed vital information for school districts and legal authorities seeking greater equity in school facilities funding.

There is not a great deal of research about the relationship between the condition of school facilities and certain educational outcomes. In the last twenty years, there have been several attempts to examine this relationship in various parts of the country. However, there have been very few studies done in Texas on the relationship between the condition of school facilities and certain educational outcomes. This study was the first of its kind to use data collected in a survey of the school districts in the entire state of Texas conducted by an official state agency, the Texas Comptroller of Public Accounts.

This study was the first study of the relationship between the condition of facilities and educational outcomes utilizing a survey of all rural high schools in the state of Texas. Texas does not maintain a state-wide database on the condition of school facilities in the state. This study provides policy makers with some basic information that may help them see the need for a state-wide collection of facility data to be used to address future facility needs. Policy makers need accurate information on which to base their decisions to implement program to address state aid for upgrading school facilities. This study may

help state policy makers evaluate their responsibility for providing appropriate public school facilities for all students.

This study provided useful information to educational leaders as they consider possible improvements to school facility infrastructure in local school districts. Educational leaders could use this information to justify the support of bond elections for the purpose of improving school facilities.

This study will be helpful for educational leaders trying to find ways to increase the academic achievement of their students. Earthman (1998) found that there is an educational disadvantage of five to seventeen percentile points on standardized tests for students housed in facilities rated as poor as compared to facilities rated as high quality. Policy makers and educational leaders worried about student achievement for all children will insist that no child should attend a school that is inferior in quality to other schools.

It is difficult in any research study of student achievement to control for all of the confounding variables that may also impact the variance in student achievement. School officials do not have much control over some factors that may impact student achievement, such as family background and socioeconomic status. However, even if the variance in student achievement caused by the condition of school facilities is small, it is important to remember that the condition of school facilities can be controlled to at least some degree by school officials. Improving the condition of school facilities is one way that educational leaders can have a positive impact on student learning and academic performance.

Theoretical Framework

A theoretical model showing a relationship between the condition of school facilities and student outcomes was first designed by Cash (1993). Although there are several variables that might affect the quality of school conditions as well as student achievement, Cash's theoretical model shows that student achievement is affected by the quality of the school's facilities in rural high schools in Virginia. The model designed by Cash may be viewed in Figure 1.1.

A study of urban high schools in Virginia by Hines used Cash's theoretical model. The model used by Cash and Hines showed several factors that can be attributed to the circumstances that affect building condition. The total amount of money available for education, the value the community places on education, and other external factors affect the quality of school facilities. These factors also affect the money available for maintenance of the facilities and the selection of personnel in school leadership positions (Hines, 1996).

Cash pointed out that the leadership of the school establishes the vision that determines the importance of the school facilities which house the educational process. If the level of importance is high, then the educational leaders will communicate to the staff the importance of creating a physical environment which promotes quality education. The maintenance and custodial staff will then have a corresponding effect on school building conditions (Cash, 1993).

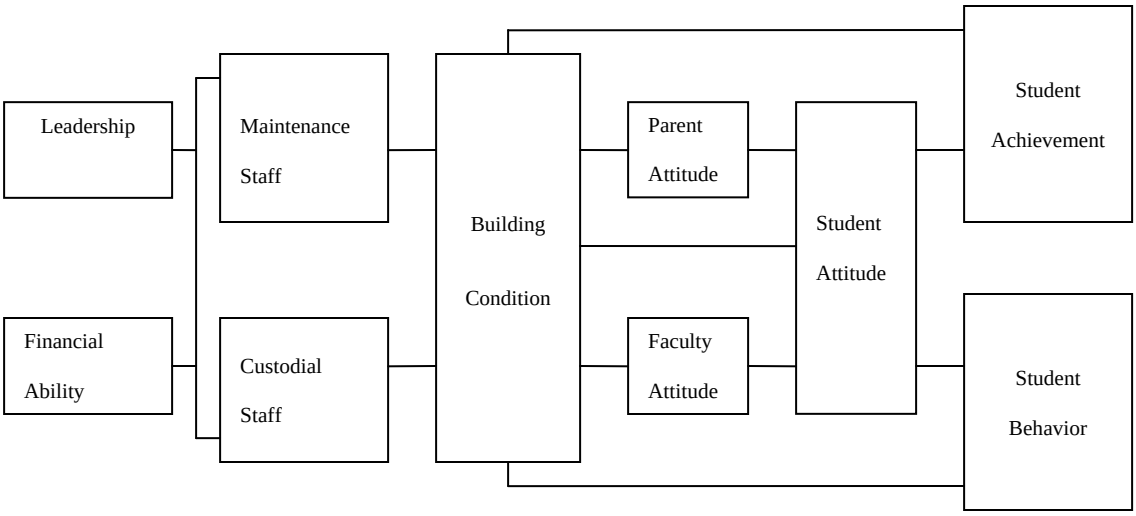

Figure 1.1. Theoretical Model Developed by Cash (1993)

Lemasters (1997) modified the Cash model by adding cosmetic and structural components. He extended the theoretical model into the elementary school. The model designed by Lemasters may be viewed in Figure 1.2. He added several antecedents to the condition of school facilities, which are influenced by factors outside of the model, yet they are important factors in determining the condition of school facilities. These exogenous variables included deferred maintenance, funding priorities, and administrative decisions.

Each of the models showed how the condition of school facilities may directly and indirectly affect student outcomes. The direct impact on student outcomes came from such variables as temperature control, lighting, acoustics, overcrowding, etc. The condition of school facilities may indirectly affect student outcomes by affecting parental and faculty attitudes, which then affected the attitude of students (Cash, 1993).

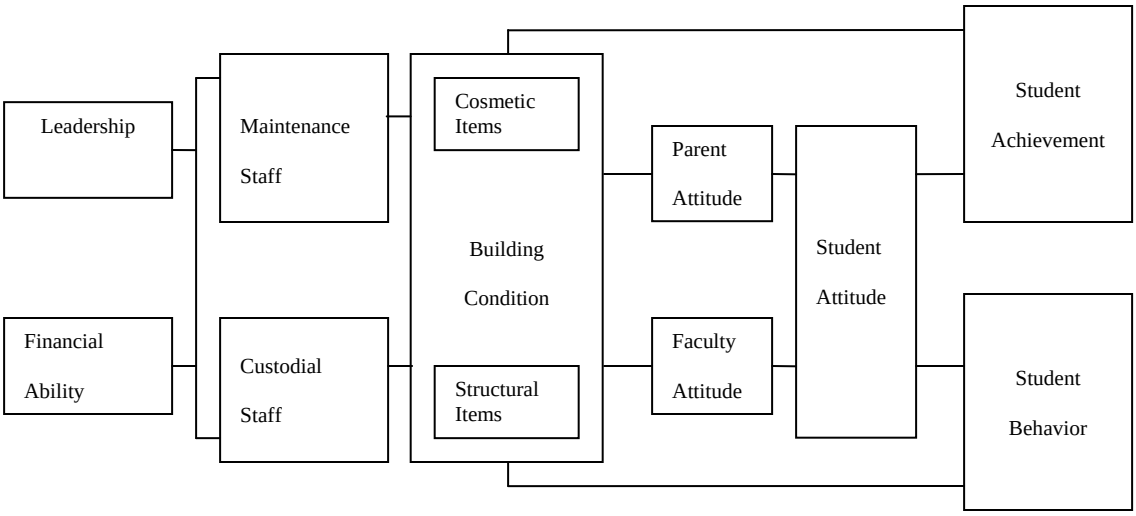

Figure 1.2. Lemasters (1997) Revision of Cash's Theoretical Model

The theoretical model in this study utilized a simplified version of Cash's basic model, but added the variable teacher turnover as one of the educational outcomes. The model in this study may be viewed in Figure 1.3. The more homogeneous the grouping of schools, the more definitive the findings regarding the relationship between the condition of school facilities and student achievement. Small, rural high schools in Texas have many of the same educational needs. The student population is relatively stable, so the variables for student outcomes may better reflect the current school environment than would a study of all of the high schools in the state of Texas.

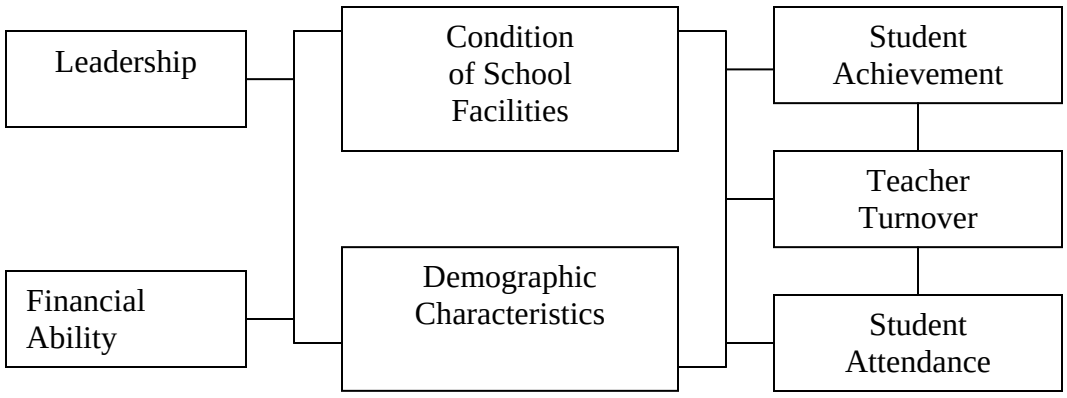

Figure 1.3. Theoretical Model Used in This Study

Purpose of the Study

Clearly, it is important for educational leaders and policy makers to address the physical qualities of the school facilities that impact student achievement and other educational outcomes. We must not simply require higher standards without providing the resources to fully fund the requirements of the law. “If raising the level of student achievement is an important issue to local school boards, these bodies may well want to improve the physical school environment of the students” (Cash, 1993, p. 9). Educational leaders must identify those school facility factors that contribute to student achievement and make improvements in those spaces that will foster increased student learning.

The purpose of this study was to examine the relationship between the condition of rural public high school facilities in Texas and certain educational outcomes. The condition of facilities variables selected for this study included: general condition of

school facilities, percent portable to total square feet per student, percent (over) under capacity, average age of facilities, number of years since last renovation, and percent deferred maintenance.

The demographic variables selected for this study included: student wealth level (percent of economic disadvantage students), school district wealth level (property value per student), and percent minority students. The educational outcome variables selected for this study included: student achievement, student attendance, and teacher turnover.

Research Question

The following research question was used in this study: What is the relationship between the condition of school facilities and certain educational outcomes, particularly in rural Texas public high schools?

Delimitations of the Study

The following statements were prescribed delimitations for this investigation.

1. The data used in this study was confined to the data collected by the Texas Comptroller of Public Accounts through a survey sent to all school districts in Texas in 2006. The survey asked for responses from the state's 1,037 taxing and non-taxing school districts and charter schools. This study excluded non-taxing entities and charter schools. The data were confined to the 2005-2006 school year.

2. This study was confined to those variables relating to the condition of school facilities that were measured by the 2006 Texas Comptroller's Facility Survey and developed and tested by representatives with facilities expertise from the Texas Association of School Administrators (TASA), Texas Association of School Boards (TASB), Texas Association of School Business Officials (TASBO), the Texas Education

Agency (TEA), the executive directors and staff of the state's 20 Regional Education Service Centers (RESCs). The variables representing the condition of public school facilities include the general condition of school facilities, percent portable to total square feet per student, overcrowded facilities, age of facilities, number of years since last renovation, and percent deferred maintenance.

3. There are many variables that relate to educational outcomes, and there are numerous school district characteristics. This study was confined to the following variables relating to educational outcomes: student achievement, teacher turnover rate, and percent student attendance. This study was confined to the following school district demographic characteristics: school district property wealth, student wealth level, and percent minority students.

4. This study was confined to rural public high schools in Texas. It would be difficult to generalize the findings in this study to non-rural high schools.

Limitations of the Study

The following statements were prescribed limitations for this study.

1. The survey was a voluntary survey and required considerable time to complete by school district administrators and facilities managers.

2. There are many variables that are known to have an impact on educational outcomes that were deemed outside the scope of this study.

3. There are many variables relating to the conditions of school facilities and other school district demographic information that were deemed outside the scope of this study.

4. The study was limited to the degree to which the return of the surveys is representative of all school districts in Texas.

5. The study was limited to the degree of accuracy of the respondents to the survey instrument. Using professional school district personnel to complete the survey helped to insure reliability of the findings, although the researcher acknowledged some degree of personal bias associated with any self-reporting survey.

6. The study was limited to the degree the select conditions of facilities are representative of those physical features which affect the quality of the learning environment in a public school classroom.

7. A multiple regression analysis does not signify a causal relationship between the variables. Any significant relationship found among variables in this study can not be characterized as a causal relationship.

Assumptions

1. The 2006 Texas Comptroller's Facility Study was an appropriate survey instrument for the measurement of the condition of school facilities in Texas.

2. Data retrieved from the 2006 Texas Comptroller's Facility Study were accurate as reported from the Superintendents and Facility Managers of each school district.

3. The data for this study were aggregated at the same unit of analysis (per student) as suggested by prior research.

4. There is an interrelationship among education outcomes.

5. There was little or no researcher bias. The researcher is the superintendent for a public school district that is classified by the Texas Education Agency as *Non-Metro: Stable*. However, there was little or no researcher bias due to the fact that the survey used in this study was objective in nature. All of the data were objective and factual in nature. The one question that could possibly be construed as subjective had clear definitions as to

the meaning of each possible answer. In addition, the superintendent was not the person who completed the survey for his school district. The school district director of maintenance completed the survey in 2006.

Definition of Terms

Academic Excellence Indicator System (AEIS). The Academic Excellence Indicator System is a report from the Texas Education Agency for all Texas public schools. The report contains data by school and school district. The data includes such information as TAKS scores, dropout rates, graduation rates, and attendance rates. The information is reported for the entire school district and by grade level. The report is also divided into various sub-population groups, including ethnic, socioeconomic, and special education students. This system determines the accreditation ratings for each school and school district.

Ad valorem tax. An ad valorem tax is a tax based on the assessed value of real property.

Average daily attendance (ADA). The average daily attendance (ADA) is the number of eligible days students are present divided by the total number of days in a school year.

Average years experience of teachers with district. The Academic Excellence Indicator (AEIS) Report provides the average number of years of experience for teachers at each high school in Texas. Average years experience of teachers with district will serve as a proxy for teacher turnover rate in this study.

Capital outlay. Capital outlay is the cost incurred by schools for land or facilities, improvements to grounds, construction of facilities, additions to facilities, major remodeling of facilities, or purchase of major equipment.

Chapter 41 district. According to the Texas Education Code, a chapter 41 district is a school district with a property wealth of over $315,000 of appraised property value per student, more commonly referred to as a property wealthy school district.

Chapter 42 district. According to the Texas Education Code, a chapter 42 district is a school district with a property wealth of below $315,000 of appraised property value per student, more commonly referred to as a property poor school district.

Comptroller Property Tax Division Value (CPTD Value). The Comptroller Property Tax Division Value (CPTD Value) is the property value set by the Texas Comptroller's office for school district state revenue calculations.

District type. The Texas Education Agency classifies school districts as district type on a scale ranging from Major Urban to Rural. Factors such as size, growth rates, student economic status, and proximity to urban areas are used to determine the appropriate group. The Texas Education Agency defines the classification of public school districts as follows:

> Major Urban is the classification of the largest school districts in the state that serve the six metropolitan areas of Houston, Dallas, San Antonio, Fort Worth, Austin, and El Paso.
>
> Major Suburban is the classification of other school districts in and around the major urban areas. Generally speaking, major suburban districts are contiguous to major urban districts.
>
> Other Central City is the classification of the largest districts in counties with populations between 100,000 and 699,999 and are not contiguous to any major urban districts.

> Other Central City Suburban is the classification of other school districts in and around the other large, but not major, Texas cities. Its enrollment is greater than 3 percent of the contiguous Other Central City district.
>
> Independent Town is the classification of the largest school districts in counties with populations of 25,000 to 100,000.
>
> Non-Metro: Fast Growing is the classification of school districts that are not in any of the above categories and that exhibits a five-year growth rate of at least 20 percent. These districts must have at least 300 students in membership.
>
> Non-Metro: Stable is the classification of school districts that are not in any of the above categories yet have a number of students in membership that exceeds the state median.
>
> Rural is the classification of school districts that either have a growth rate less than 20 percent and the number of students in membership is between 300 and the state median or the number of students in membership is less than 300.
>
> (Texas Education Agency, 2006).

Debt service. Debt Service is the cost incurred by schools for the repayment of loans or bond principal, interest, and service charges.

Educational outcomes. Educational outcomes refer to effects of the educational process of schooling. For this study, these effects include student achievement, teacher turnover rate, and student attendance as defined below.

High-income students. High-income students are defined in this study as students who do not qualify for the school federal free- or reduced-lunch program.

High-wealth school district. High-wealth school districts are defined in this study as school districts with $315,000 or more of appraised property value per student.

Low-income students. Low-income students are defined in this study as students who qualify for the school federal free- or reduced-lunch program.

Low-wealth school district. Low-wealth school districts are defined in this study as school districts with less than $315,000 of appraised property value per student.

Maintenance and operation. Maintenance and operation (M&O) refers to that part of a school district budget that is required to maintain and operate the school district, i.e., salaries, textbooks, supplies, maintenance of schools, transportation, and utilities.

Minority students. Minority students are defined in this study as students who are classified as non-white students by the Texas Education Agency. The percent of minority students is reported by the Texas Education Agency in their Academic Excellence Indicator System (AEIS).

Percent economic disadvantage students. Percent economic disadvantage students is a demographic variable measured by the percent of students who qualify for the federal free- or reduced-lunch program as reported by the Texas Education Agency in its Academic Excellence Indicator System (AEIS).

Percent student attendance. The percent student attendance of each high school is the average percentage of attendance for students at the high school for any given school year. Percent student attendance is reported by the Texas Education Agency in their Academic Excellence Indicator System (AEIS).

School district wealth level. School district wealth level will be defined in this study as the taxable property value per student of a public school district as determined by the State Comptroller Property Tax Division (CPTD) and reported by the Texas Education Agency in their Academic Excellence Indicator System (AEIS).

State achievement test. The state achievement test for this study is the Texas Assessment of Knowledge and Skills (TAKS).

Student achievement. This study defines student achievement as the average TAKS scores in grade 11 for all tests taken, as reported by the Texas Education Agency in their Academic Excellence Indicator System (AEIS).

Student wealth level. The Texas Education Agency (TEA) defines student wealth level as the percent of students classified as economically disadvantaged, which is measured by the percent of students who qualify for the federal free- or reduced-lunch program as reported by TEA in its Academic Excellence Indicator System (AEIS).

TAKS. TAKS refers to the Texas Assessment of Knowledge and Skills. This is the Texas state assessment instrument for all public schools in Texas, except for public charter schools. Scores on this annual state assessment are a major determination of a school or school district's accreditation status.

Teacher turnover rate. The Texas Education Agency (TEA) does not provide data regarding teacher turnover in Texas at the school level. TEA does not provide data regarding teacher turnover in Texas at the school level. However, TEA does provide the average number of years of experience for teachers at each high school. This study defines teacher turnover as the average years experience of teachers with district as reported by TEA in its Academic Excellence Indicator System (AEIS). This is the average number of years of experience of teachers at each high school.

Wealth per weighted student (WADA). Wealth per weighted student refers to the amount of funds per weighted student based on dividing the property wealth of a district by the number of weighted students in that district. WADA is further defined as the number of weighted students per average daily attendance.

Wealth recapture. Wealth recapture, more commonly referred to as "Robin Hood," is the process by which districts considered property wealthy under Texas Education Code, Chapter 41, must transfer money to the state or another school district based on their wealth per weighted student exceeding the statutory limit.

Weighted student. A weighted student is a student with high needs to whom a statutorily pre-determined funding weight per instructional program is applied to determine the amount of funds received by a school district to educate this student.

Overview of the Study

This study was organized into five chapters. Chapter I provided an introduction and statement of the problem that gave context to the study. A study of how the condition of facilities affected educational outcomes was relevant in the context of equal educational opportunity for all children.

The significance of the study is outlined in Chapter I. This section provided support for the need to study the relationship of school facilities and educational outcomes.

Chapter II was a review of the relevant literature related to the notion of how the condition of school facilities and various demographic characteristics of schools affect certain educational outcomes, such as student achievement, teacher turnover, and student attendance. A history of school facilities funding and litigation in Texas and the United States is given to provide further context for the availability of resources to address school facilities needs, particularly in rural schools.

Chapter III contained the methodology used in this study. The chapter describes the data to be analyzed and the predictor and criterion variables used in the study. Finally, the chapter describes the methodology using multiple regression analyses.

Chapter IV included the presentation and analysis of the data using multiple regression analyses.

Chapter V included the conclusions of each of the multiple regression analyses performed. The chapter then provided a discussion about each of the condition of facilities variables as they relate to student achievement, teacher turnover, and student attendance. Finally, several practical implications for this study were given for policy makers and educational leaders. The chapter concluded with a discussion of recommendations for possible future research in this area.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The purpose of Chapter II was to provide a review of related literature and research. This review provided a basis for understanding the ways in which important issues related to the condition of school facilities have been described in recent literature and research, particularly with regard to demographic variables and certain educational outcomes. There is very little research about the relationship between the condition of school facilities and certain educational outcomes. In the last twenty years, there have only been a small number of attempts to examine this relationship in various parts of the country, particularly in Virginia by Cash (1993), Hines (1996), and Lanham (1999).

A comprehensive review of the literature revealed that there has only been one study on the relationship between the condition of school facilities and student outcomes in Texas. The one study found in Texas focused on the impact of school facilities on student achievement, behavior, attendance, and teacher turnover rate in Central Texas middle schools. O'Neill and Oates (2001) developed the survey used in that study that was sent to middle school principals in Central Texas. An additional study in Texas will add to the body of knowledge because of the size of the state and the diversity of its student population.

This study utilized data that came from a survey developed by the Texas Comptroller of Public Accounts. The Comptroller developed the survey in cooperation with the Texas Education Agency and representatives from the Texas Association of School

Administrators (TASA), Texas Association of School Boards (TASB), Texas Association of School Business Officials (TASBO), Regional Education Service Centers, and individuals with facility expertise. This is the only study of its kind in Texas found to use data collected from an official survey developed by a state agency.

This review of literature first examined the condition of school facilities in the United States. The review then examined several important variables related to the condition of school facilities, school demographic variables, and variables related to educational outcomes, as well as the condition of rural school facilities. Finally, the review examined the literature on the inequity of Texas school facilities funding, using court cases in Texas and Wyoming to illustrate the inequities in school facilities funding.

Condition of School Facilities

Schools across the United States are facing a facility crisis. In 1995, the General Accounting Office conducted a survey of the facilities needs of school districts in the United States. The study documented widespread physical deficiencies in many school facilities across the country. Data from the General Accounting Office study reported that it would take about $112 billion to repair or upgrade schools in the United States to good condition. Some schools have very few facility needs, while others have very inadequate facilities. According to the General Accounting Office study, almost 60% of schools in the United States had at least one major building feature that needed to be repaired, overhauled, or replaced. One of the most disturbing findings was that the most likely students to attend the most inadequate facilities were the academically neediest students—minorities and low-income students (General Accounting Office, 1995).

The following year, the General Accounting Office reported that almost one in four schools in the United States reported at least one on-site building in inadequate condition. In addition, 76% of schools reported a need to upgrade or repair on-site buildings to good overall condition (General Accounting Office, 1996b).

The condition of school facilities nationwide is one of deterioration and obsolescence. President Bill Clinton, in his 1997 State of the Union Address, stated that "we cannot expect our children to raise themselves up in schools that are literally falling down. With the student population at an all time high and record numbers of school buildings falling into disrepair, this has now become a serious national concern" (Clinton, 1997).

The National Center of Education Statistics (1999) reported the average age of public school buildings in the United States in 1998 was 42 years old. School facilities have a predictable life cycle. Most roofs, lighting fixtures, and heating equipment have been replaced by the time a school building is 30 to 40 years old. About 40% of schools report unsatisfactory environmental conditions. School buildings begin rapid deterioration when the buildings are over 40 years old, and most schools are abandoned after 60 years (Ornstein, 1994).

Older school facilities are more prevalent in schools with a higher percentage of low-income children than those with a higher percentage of high-income children. A higher proportion of children in poverty enroll in the oldest school buildings in the United States. Twenty percent of schools with high-income students were built before 1950. However, 33% of schools with low-income students were built before 1950 (National Center for Educational Statistics, 1999).

About one-half of America's schools have poor ventilation, heating problems, lighting problems, or poor physical security. One survey estimated that the amount of deferred maintenance for rural schools has approached $2.6 billion, and the cost to replace rural school facilities was approximately $18 billion (Dewees & Earthman, 2000).

In 2006, the Building Educational Success Together (BEST) research team examined school construction spending across the nation from 1995 through 2004. BEST reported an investment of $500 billion in school facility construction in the United States during those ten years. However, in spite of the amount of investment in school facilities, there still remains a great disparity in the most dilapidated and overcrowded school facilities in low-income communities compared to the facilities in high-income communities. Low-income communities made an average investment of $4,140 per student in facilities compared to an average investment of $11,500 per student in facilities in the high-income communities (Filardo, Vincent, Sung, & Stein, 2006).

Filardo et al. (2006) found that school districts with predominantly minority student enrollment invested $5,172 per student on facilities from 1995 through 2004, while school districts with predominantly white student enrollment spent $7,102 per student on facilities during this same time period.

Overcrowded Facilities

Overcrowded schools utilized spaces for teaching that were never intended to be used as classrooms, such as libraries, gymnasiums, laboratories, cafeterias, storage areas, and closets. The National Center for Educational Statistics (2000) reported that one in four public schools were overcrowded. Earthman (2002) found that overcrowded school

facilities have a negative influence on student performance of low-income and minority students.

There were very few studies of the long term effects of overcrowded conditions in schools. One study of a school district that experienced overcrowded conditions over several years was done in New York City. In a study of four New York City public schools with a high percentage of low-income students from 1990 to 1996, overcrowding was found to have a negative impact on student achievement. In those school districts, the proportion of 6th grade students who passed the minimum standard for the standardized reading test was four to nine percentage points below that of schools that were not overcrowded. The proportion of 6th grade students who passed the standardized math test was two to six percentage points below that of schools that were not overcrowded. Students in overcrowded schools are at a huge disadvantage to students who are not attending overcrowded schools (Rivera-Batiz & Marti, 1995).

In a survey of 213 teachers in overcrowded New York City public schools, teachers said that overcrowding and lack of space was a higher priority to address than sanitation, maintenance, violence, and other issues. Seventy-five percent of the teachers said that overcrowding affects classroom activities, instructional techniques, and student achievement. Seventy percent of the teachers also said that overcrowding was leading to staff burnout (Rivera-Batiz & Marti, 1995).

General Condition of School Facilities

As the general condition of school facilities improve, so do the average student achievement scores. A study of public schools in the District of Columbia in 1991 found that as a school facility improved its general condition from poor to excellent, the average

achievement score increased 10.9 points (Earthman, 2004). A study of the Milwaukee Public Schools found that when differences in the individual ability of students was controlled, measures of school facilities explained as much of the differences in test performance across schools as did indicators of family backgrounds and school attachment. Significant facility measures explained about 10 to 15 percent of the differences in scores across schools, when the influences of the other variables were statistically controlled (Lewis, 2001).

A study of rural high schools in Virginia compared the Iowa Test of Basic Skills (ITBS) scores of students with the condition of school facilities. The condition category of the facilities were substandard, standard, and above standard. The study found that test scores of student in school facilities rated as above standard were as many as five percentage points above the scores of students in school facilities rated as poor (Cash, 1993). A study of the relationship between the condition of school facilities and student achievement was conducted in 2002 in the public school districts of Washington, D.C., and Chicago, Illinois. After controlling for poverty, ethnicity, and school size, the study found that students educated in school facilities rated as good were performing from three to four percentage points better on reading and math than students educated in school facilities rated as poor (Schneider, 2002).

The same methodology and data-gathering instrument Cash developed was used in a study of large urban high schools in Virginia. The results of this study were basically the same as Cash's study. The test scores for students in schools rated as above-standard were nine points higher for writing and science, 15 points higher for reading, and 17 points higher for mathematics compared with the same scores for students in substandard

buildings (Hines, 1996). When students attend school in facilities that are of lesser quality than other students, equity of educational opportunity comes into question. If students who are educated in school facilities with poor conditions perform 5-17 percentage points lower than students in school facilities rated as "good," the students in poor school facilities are disadvantaged when it comes to educational opportunity.

Portable Classrooms

Portable classrooms serve the purpose of relieving overcrowded conditions of school facilities until permanent facilities can be built. A study by the National Center for Education Statistics (2000) reported that one-third of the nation's schools use portable classroom facilities. Portable facilities are seen to be a temporary solution to the problem of overcrowded conditions of school districts. However, too often these *temporary* solutions become permanent structures and remain in use in some school districts twenty to forty years after being moved onto a school campus.

Chan (2005) studied the use of portable classrooms in eleven Georgia elementary schools and found the physical conditions of portable classrooms were inferior to that of permanent classrooms. Most of the portable classrooms in the study were poorly configured, lacked internet access, and were overcrowded. Lyons (2001) reported several problems inherent with portable classrooms. One of the problems noted by Lyons was the safety risk of portables being located away from the main school facility. Students and teachers must walk between buildings to go to the restroom, media center, gym class, etc. Portable classrooms also have higher utility and maintenance costs per square foot than permanent school facilities.

The use of portable classrooms to address overcrowded conditions in schools affects property-poor school districts to a greater degree than property-wealthy school districts. In a study of Nebraska school facilities, Pool (1993) reported that school districts with low property value per student had more portable facilities than school districts with high property value per student. This difference in the number of portable facilities illustrates that there are more overcrowded conditions and less capacity to build new facilities in property-poor school districts. The abundance of portable facilities in property-poor school districts may demonstrate the lack of equal educational opportunity that exists for children in property-poor school districts.

Age of School Facilities

More students in rural areas attend schools with school facilities over 50 years old than do students in suburban areas. In addition, schools with an enrollment of over 50% low-income students generally have older facilities than do schools with an enrollment of less than 50% low-income students (National Center for Education Statistics, 1999). Pool (1993) found that schools with a majority of school facilities categorized as older facilities reported frequent deferred maintenance; limited ability to restructure the district's instructional program; less capability to meet facility needs without raising taxes; and an urgent need for a bond issue, but not much prospect of the bond referendum being successful.

As a general rule, older facilities do not have building features that enhance student performance, such as control of the thermal environment, acceptable lighting, acoustical control, and proper square footage to meet today's innovative teaching requirements. Several studies confirmed that students in newer school facilities significantly

outperformed students in older facilities in tests of reading, listening, language, and arithmetic (Earthman, 2004). A study of high schools in Georgia by Garrett (1980) concluded that school facility age does influence student achievement. Garrett also reported that student attitudes were affected by the quality of the learning environment.

Bowers and Burkett (1988) studied the relationship of school facility age and student achievement using two elementary school facilities from the same school district in rural Tennessee. These two schools were thought to have similar students, faculty, and educational program. Bowers and Burkett concluded that a relationship did exist between the physical environment and student achievement, health, attendance, and behavior. The students in the newer school performed higher than students in the older school on all available measures of achievement.

The older a school facility, the greater the negative impact that facility has on a student. Ikpa (1992) found a relationship between age of school facilities and the gap in student achievement. Ikpa's research indicated that as the age of the school building increased, achievement test scores of students decreased. The age of school facilities seems to be a significant school characteristic in explaining the variance in test scores.

O'Neill and Oates (2001) studied the impact of school facilities on student achievement, behavior, attendance and teacher turnover rates in selected Central Texas middle schools. O'Neill and Oates found that several of the building variables were significantly related to student achievement, but the variable having the strongest relationship with student achievement was the age of the facility. A particularly strong relationship existed between the age of the school facilities and the percentage of eighth grade students passing reading.

These studies demonstrate that older school facilities are detrimental to the educational process of students. Older school facilities cannot compare with either the quality of new facilities or providing the infrastructure for the latest innovative ideas and technology. Older school facilities are obsolete and cannot meet current educational needs without major renovation (Chan, 1996).

Number of Years Since Last Renovation

One of the most reliable indicators of the true age of school facilities was the number of years since its last major renovation. The age of school facilities was usually an accurate indicator of the condition of the facilities. Older school facilities do not usually have the building features of newer school facilities such as adequate classroom spaces, new technology infrastructure, and energy efficient environmental systems. However, major renovation of older school facilities can transform obsolete facilities into school facilities that are comparable to the newest facilities. The lack of major renovation of older school facilities greatly restricts the school's ability to meet the current needs of students.

Schools that have not renovated older facilities in recent years face difficulty in improving their educational programs. The National Center for Education Statistics (1999) reported statistics on the year that schools underwent their last major renovation. About three-fourths of public schools in America have undergone at least one major renovation. Seventeen percent of schools reported last undergoing a major renovation prior to 1980; seventeen percent reported the last major renovation between 1980 and 1989; and 39% reported the last major renovation between 1990 and 1995. The study

reported that the number of years since the last major renovation is not related to student enrollment, locale, or region.

The date of the last major renovation has important implications for policymakers in evaluating whether or not school facilities are equipped to meet contemporary standards and expectations. Older school facilities must be renovated to allow for new technology infrastructure, adequate space for new instructional techniques, and energy efficient environmental systems.

Deferred Maintenance

Many school districts facing aging facilities simply put off performing critical facility maintenance and upgrades due to a lack of funding. Deferred maintenance is a concern especially for rural school districts. Rural school districts are constructing new school buildings and upgrading old ones at a slower rate than non-rural districts. From January 1994 to June 1998, about "21% of districts in urban areas constructed at least one new school compared to only nine percent of districts outside of urban areas" (Dewees & Earthman, 2000, p. 12).

Many rural school districts have little capacity to support bonds that fund facilities upgrades. Rural districts are often situated in communities with a small population, inadequate tax bases, and regulatory limits to their debt. These factors "restrict their ability to generate the revenues required to build school facilities" (Dewees & Earthman, 2000, p. 11). A declining enrollment found in many rural school districts translates into fewer taxpaying citizens and a shrinking tax base. Fewer taxpayers mean less revenue capacity available for supporting bonds to update facilities.

Rural districts usually have lower property value assessments. Facilities funding is generally tied to property values, so rural schools will have less actual capacity for bonded indebtedness. Less capacity for bonded indebtedness results in less revenue available to address the problems of age-related deterioration of school facilities.

Another indication of the lack of capacity to support bonds to upgrade facilities was that rural areas have a higher proportion of residents in or near poverty compared to metropolitan areas. Schools that serve a higher proportion of children in poverty are more likely to house their students in older facilities (Dewees & Earthman, 2000). In rural areas, "26.3% of residents live in households with income between one and two times the poverty line, compared with 18.2% in urban areas" (Nord, 1997, p. 31). As a result, poor rural communities may have difficulty raising support for bond issues to build public school facilities.

Williams reported that rural American families generally have less income than urban and suburban families. Williams indicated that rural family earnings are 71% of urban family earnings. Mathis (2003) reported that 244 of the 250 poorest counties in America are rural. Poverty rates in the poorest counties run two to three times higher than the national average (Williams, 2003).

In Texas, state statutes prohibit some small, rural school districts from incurring debt sufficient to replace existing facilities. Long-term debt for school districts that receive state assistance from the Instructional Facilities Allotment is limited by the greater of $100,000 per year or $250 per student in average daily attendance per year (Texas Education Code, Section 46.005, 1997). Some small school districts may not have the capacity to incur the debt they need because of the lack of student population. Small

schools that receive state assistance by participating in the Existing Debt Allotment program are limited to a debt tax rate that may not exceed $.29 per $100 of valuation (Texas Education Code, Section 46.034, 2007).

Policy makers must address the difficulty rural schools face with regard to facilities, or these school districts will continue to put off critical facility upgrades. Many rural schools have facilities that are in great need of repair or replacement; yet, some school districts may lack the capacity to raise the necessary funds to solve these facilities needs. This lack of capacity contributes to the inequities in school facilities funding (Texas Education Agency, 1997).

Rural School Facilities

Texas has the "largest number of rural students attending the largest number of rural schools" in the nation (Stern, 1994, p. 15). Two-thirds of Texas' school districts enroll fewer than 1,500 students (Dawn & McLaughlin, 1999). Yet, there has been limited research on rural education. This lack of research may reflect the low priority given to rural education on a national policy level. Rural schools across the nation face critical facilities issues. The General Accounting Office (1996a) reported that 51% of rural schools have at least one inadequate building feature, such as roofs, foundations, walls, plumbing, HVAC, and electrical features (Dewees & Earthman, 2000).

Full compliance with the Americans with Disabilities Act of 1990 is another building feature that rural schools lack. This act required schools to install such building features as access ramps, automatic doors, and elevators. Many rural schools lack the resources necessary to upgrade their facilities to fully comply with these federal requirements (Dewees, 1999). On September 25, 2008, President Bush reauthorized the Americans

with disabilities Act by signing into law the Americans with Disabilities Act Amendments Act of 2008 (ADA Amendments Act). The ADA Amendments Act expanded the definition of disability and generally makes it easier for an individual to establish that he or she has a disability (U.S. Equal Employment Opportunity Commission, 2009).

Rural schools lack building features that effectively deal with environmental conditions. Environmental conditions threaten student safety and interfere with classroom activities. A majority of rural schools report at least one unsatisfactory environmental condition. These deficiencies include energy efficiency, indoor air quality, and ventilation (Dewees, 1999). Without the resources to fund new facilities, many rural school districts will continue to use "run-down, dilapidated, and out-dated buildings" (Stern, 1994, p. 50).

Clean, quiet, safe, comfortable, and healthy environments are important components of successful teaching and learning. Unfortunately, studies show that schools serving poor and minority students suffer disproportionately from poor indoor air quality. Poor indoor air quality has been associated with student and teacher health and safety issues, as well as increased student absenteeism. A school that improves its indoor air quality will see better school attendance and improved academic performance (Schneider, 2002).

Rural communities have fewer businesses, less population, and generally lower assessed property value than urban or suburban communities. Thus, school districts in rural communities generally tend to be property-poor districts. Property-poor districts often have several building deficiencies when compared to property-wealthy districts.

A survey in Nebraska compared property-poor school districts to property-wealthy school districts. Property-poor school districts had more buildings that did not accommodate the use of technology, more deferred facility maintenance, more facilities inhibiting instructional change, and more temporary facilities. In contrast, property-wealthy school districts had buildings that did accommodate educational change, facilities that did accommodate the use of technology, and these districts had less bonded indebtedness (Pool, 1993).

Rural school districts with declining enrollments face several additional challenges when compared to school districts with increasing enrollments. School districts with declining enrollments were found to have several infrastructure deficiencies, such as "interiors and exteriors in poor condition, facilities inhibiting changes in the educational programs, buildings with safety hazards, delayed maintenance, little bond debt, and low anticipation of success of bond issues" (Pool, 1993, p. 5).

One of the critical building features that rural schools lack is the infrastructure necessary for modern technology. Technology can help rural schools overcome barriers associated with isolation, but many rural schools lack the infrastructure to support the technology. One study reported that 84% of rural schools lack fiber optic cable, and 46% lack operational computer networks. Nearly half of rural schools have six or more unsatisfactory technology elements (Dewees & Earthman, 2000).

Another building feature that rural schools lack is flexible spaces for instructional areas. These flexible spaces are needed for new teaching strategies and contemporary teaching formats. These are spaces that can be used for small-group instruction, science

labs, and media centers. One study reported that 37% of rural schools lack adequate science labs, and 13% lack an adequate media center (Dewees & Earthman, 2000).

Demographic Characteristics of Schools

School District Wealth Level

The quality of school facilities should not depend on the wealth of the local community, because every child deserves an education in quality facilities. Low-wealth school districts face a greater challenge of updating school facilities than schools in more affluent districts. High-wealth school districts have more capacity to finance major facility renovations and new facilities than low-wealth school districts. When school facilities funding is based on local property wealth, there will be inequities in the condition of the school facilities. Low-wealth school districts tend to have relatively high tax rates and low education expenditures, while high-wealth school districts tend to have low tax rates and high education expenditures (Pool, 1993).

There is a great disparity in the most dilapidated and overcrowded school facilities in low-wealth communities compared to the facilities in high-wealth communities. Filardo et al. (2006) found that in the period from 1995-2004, low-wealth communities made an average investment of $4,140 per student compared to an average investment of $11,500 per student in the high-wealth communities. A survey of school principals in New Jersey revealed significant disparities in the overall condition and overall educational adequacy in low-wealth schools districts when compared to other school districts (Schneider, 2002).

In Texas, high-wealth school districts have increased their bonded indebtedness dramatically since Senate Bill 7 was passed in 1993, commonly known as *Robin Hood*.

This bill, adopted in response to school finance litigation, served to partially equalize the wealth between school districts by recapturing some of the revenue from property wealthy school districts and redistributing it to property poor school districts. The state funded debt service to pay for capital improvements for wealthy school districts, allowing those school districts to keep 100% of their debt service tax revenue. As a result, many wealthy school districts have been able to take a bond package to the voters without increasing the total tax rate very much at all (Robertson, 2005).

Low-wealth school districts face more challenges than high-wealth districts in renovating their facilities. Many low-wealth school districts must place students in facilities that are old, overcrowded, and desperately need renovation. Low-wealth school districts have more portable facilities than high-wealth school districts. The difference in the number of portable facilities illustrates that there are more overcrowded conditions and less capacity to renovate or replace inadequate facilities in low-wealth school districts than in high-wealth school districts (Pool, 1993).

A study was done in Texas to determine how school districts reduced expenditures to remedy financial exigency. The study revealed that school districts facing an impending financial crisis that threatened their existence were typically property poor school districts with small enrollments. One of ways school districts reduce expenditures to remedy financial exigency is to reduce custodial/maintenance programs. All of the school districts analyzed in the study deferred maintenance to reduce expenditures in custodial/maintenance programs. Deferred maintenance will result in higher facility construction costs over time and, ultimately, will result in inadequate educational facilities for children (Rees, 2004).

Minority Students

Schools with the greatest number of minority students received less local and state revenue to spend per student than those schools with the least number of minority students. Instead of making things better for minority students, most state education systems shortchange these students by providing fewer educational resources for them. In 2005, schools in America with a high percentage of minority students received about $877 less per student in state and local funds than schools with a low percentage of minority students. In Texas, the funding gap between schools with a high percentage of minority students and schools with a low percentage of minority students is $1,385 per student when adjusted for low-income students (Arroyo, 2008).

This discriminatory gap in school funding puts schools with high minority enrollments at a great disadvantage as they compete for qualified teachers, pay for maintenance and repairs on facilities, etc. The gap of $1,385 translates into about $138,500 for an average high school of 1,000 students. This is enough revenue to fund three additional teachers and an educational aide to help improve student achievement.

Harris (2002) compared public schools in California that had the most minority students with schools that had the least minority students. The survey found that teachers in the schools with a high percentage of minority students are twice as likely to rate the working conditions in their school as poor and three times more likely to report that teacher turnover is a serious problem. Harris also reported that five percent of white students are enrolled in critically overcrowded schools while 25% of minority students are enrolled in critically overcrowded schools.

Pastor and Reed (2005) examined several aspects of infrastructure in the state of California. Regarding school facilities, Pastor found that there are three times more minority students enrolled in critically overcrowded schools than white students. Overcrowding is an important condition of school facilities, because Earthman (2002) found that overcrowded school facilities have a negative affect on student performance of minority students.

Students who are learning to speak English, or English Language Learners (ELL), are a group that most educational leaders agree need additional support to succeed in school. However, states with large percentages of ELL students are not generally providing the additional resources and support needed by those students. Schools with the highest percentage of ELL students often receive less money than schools with the lowest percentage of ELL students. Texas has one of the largest ELL populations in the nation, and yet Texas is in a tie with Nevada for having the largest ELL funding gap in the nation. Texas has an ELL funding gap between schools with a high percentage of ELL students and schools with a low percentage of ELL students of over $1,252 per student (Arroyo, 2008).

Williams (2003) found that minority students generally perform poorly on standardized tests. Williams also reported that in Texas, over half of the children in public schools are minority students. Schools along the Texas-Mexico border may have a minority enrollment of over 98%. Many of these students are classified as English Language Learners (ELL). These students are not only struggling to keep up with the basic curriculum, but they are also struggling to learn the English language at the same time.

A 2002 survey of classroom teachers in California public schools found that 50% of the teachers at schools with high percentages of English Language Learners (ELL) were more likely to rate their school's physical facilities as poor or only fair compared to thirty-four percent of teachers at schools with the lowest percentages of ELL students. These differences in the condition of facilities make the challenge of educating ELL students even more difficult at schools with the largest percentages of these students (Harris, 2002).

In a study of Nebraska school systems, Johnson (2004) found that schools with the greatest challenges to academic achievement are also the schools with the most limited resources with which to address those challenges. The study also found that those schools with the fewest challenges are the ones with the most resources. Johnson compared the 51 highest-achieving schools with the 23 lowest-achieving schools. In comparison with the highest-achieving schools, the lowest-achieving schools had a higher percentage of minority students. These same low-achieving schools received $637 per pupil less in total general fund revenue.

Student Wealth Level

The inadequate condition of school facilities has the largest affect on schools serving low-income students, which includes many rural school districts. The inadequate condition of school facilities is the result of public school funding inequities. The inequities in public school facilities funding are generally the result of over-reliance on local property values for funding. Unequal funding allows schools in affluent communities to upgrade building features in their facilities while schools in poor

communities are left without the funds to renovate these building features (Wong & Shen, 2002).

Earthman (2002) found that old, inadequate, and overcrowded school facilities have a negative influence on student performance of low-income students. Students from low-income areas have historically not performed as well as students from high-income areas. So when low-income students attend schools with old, dilapidated facilities, they are doubly disadvantaged. Poor conditions of school facilities constitute major barriers in education that directly affect opportunities for low-income students to learn and achieve at levels equal to those of other students. The failure to improve old, dilapidated school facilities may also communicate a message to low-income students that they are less valued than high-income students.

Earthman (2004) reported that most school facilities in poor condition are located in areas of greatest poverty, both in urban and rural areas. Low-income students, in particular, are not given a fair and equal opportunity to learn. Arroyo (2008) reported that, in 2005, schools in America with the highest percentage of low-income students received about $938 less per student in state and local revenue than schools with the highest percentage of high-income students. This gap in revenue has essentially remained unchanged since 1999.

Some policy makers think that federal funds should offset the disparity in revenue between schools with the highest percentage of low-income students and schools with the highest percentage of high-income students. However, federal revenues should not be included in calculating the funding gap between school districts with low-income and

high-income students. Federal funds are specifically designated to supplement, not supplant, state and local revenues (Welburn & Kysilco, 2002).

State and local revenues should, at a minimum, provide at least equal revenues between schools with high percentages of low-income students and schools with low percentages of low-income students and between schools with high percentages of minority students and high percentages of white students. These equal revenues would allow federal funds to actually supplement state and local funds to enrich the educational experience of the most challenged students. Low-income and minority students need more support than high-income and white students.

When states use federal dollars to help make up the difference in funding gaps between schools with high-income students and those schools with low-income students, then the federal funds are not being used for their intended purpose. Federal funds are meant to be used to provide extra support for students who need them, not to make up for inequities created by state policy makers. States that use federal dollars to make up the difference in funding gaps are not acknowledging that it takes more resources to educate some students, especially students with high needs.

Randolph-McCree and Pristoop (2005) reported an overall funding gap in Texas between high-wealth school districts and low-wealth school districts of $1,205 per student in 2003 (with an adjustment for low-income students). If this funding gap is not addressed by policy makers, it will be detrimental to low-income students reaching higher accountability standards put in place by Texas. With the inequity of school funding found between high-wealth school districts and low-wealth school districts, it is no wonder that there is an achievement gap between such school districts. Policymakers

must work to establish an equitable school funding system rather than the current inequitable school funding system that places low-income students at a disadvantage.

Educational Outcomes

Student Achievement

Several studies have shown that there is a relationship between the condition of school facilities and student achievement. Data from a study done in the Houston Independent School District noted this relationship. The study reported that schools with roofs in ruin, schools that rely on temporary buildings instead of permanent structures, and schools with understaffed custodial services provide an environment where students are less likely to attend school and are more likely to drop out. The overall environment of schools with inadequate facilities in Houston is one of scholastic underachievement. In fact, this study presented evidence that a school can expect to raise its academic achievement rating about twenty percent of the time by fixing roofs that are in disrepair (Branham, 2004).

Student achievement is strongly related to the quality of the teacher. Studies show that "good teachers are vital to raising student achievement and closing achievement gaps" (The Center for Public Education, 2005, p. 7). When experienced teachers leave low-income and minority schools, they are often replaced by novice teachers. Teacher turnover in these schools affect student achievement because "new teachers are less effective than experienced ones" (Schneider, 2003, p. 4). Therefore, one strategy a school district can use to positively impact student achievement in low-income and high-minority schools is to retain effective teachers. As previously stated, an effective teacher retention strategy is for school districts to improve and upgrade their school facilities.

This research is particularly critical for rural schools. Rural schools generally have a high percentage of low-income and minority students. A useful strategy for rural schools to improve student achievement for low-income and minority students may be to upgrade school facilities. This strategy may be useful in retaining effective teachers.

Cash (1993) studied the relationship between school facilities condition and student achievement in small, rural Virginia high schools. Student scores on achievement tests were adjusted for socioeconomic status. Cash found student achievement higher in school facilities with higher quality ratings. Student achievement scores were as much as five to seventeen percentile points higher in above standard school facilities as compared with facilities rated as substandard. Lower student achievement scores were related to specific building conditions such as substandard science labs, lack of air conditioning, inadequate locker conditions, and substandard classroom furniture, graffiti, and noisy external environments.

Hines (1996) replicated Cash's research using large, urban high schools in Virginia. Hines also found a very strong relationship between school facilities condition and student achievement. As school facilities condition improved, scale score improvements on standardized achievement tests ranged from an increase of 7.16 points on the social studies subtest to 11.63 points on the sources of information subtest. Both rural schools, as in the Cash study, and urban schools, as in the Hines study, showed improved test scores as the condition in school facilities improved.

This disparity in student test scores indicates that students in poor quality school facilities are at a disadvantage to students in high quality school facilities. Equal educational opportunity may not exist for students in poor quality school facilities.

Teacher Turnover

There has been very little research on the effects of school facility quality on teacher turnover. The existing research is generally limited to research on the education systems of developing countries and research by trade groups. These studies report that adequate facilities and equipment are important factors in teachers' job satisfaction (Buckley, Schneider, & Shang, 2004).

Buckley et al. (2004) found that the impact of facility improvement on teacher retention is equal to or greater than the impact of pay increases for teachers. Studies of teacher satisfaction in developing nations also showed that improvement in the quality of facilities was found to offset low wages. One benefit of the strategy of improving school facilities was that it is actually a more cost-effective teacher retention strategy than a permanent salary increase for teachers. Salary increases are on-going year after year. Facilities improvements are likely to be a one-time expense, last for many years, and have supplemental sources of state or federal funding available.

Teacher turnover is particularly important for rural school districts in Texas. The Texas Education Agency (2005) reported that rural schools had a teacher turnover rate of 19.9%, the highest teacher turnover rate of all school district categories in Texas in 2004-2005. Schneider (2004) found that the poorest school districts in New Jersey have facilities that are less likely to attract and retain teachers. In addition, Hanushek and Rivkin (2007) reported that schools with a large percentage of economically disadvantaged students are likely to have higher teacher turnover rates and higher percentages of new teachers than schools with a low percentage of economically disadvantaged students.

Hanushek and Rivkin (2007) report that new teachers are on average less effective than more experienced teachers. Rural school districts typically have both a large percentage of low-income students and a large percentage of new teachers. So the difficulties of attracting and retaining effective teachers in rural school districts' are doubled when these characteristics are considered.

It is generally perceived that teachers play a significant role in student achievement. Schools want the most effective teachers teaching their students. Hanushek and Rivkin (2007) reported that a struggling student who has a series of good teachers may offset the deficits of home environment. However, Hanushek and Rivkin found that student achievement will suffer when students continually have inexperienced teachers over several years. Many school districts struggle to attract and retain the quality teachers needed for all students to learn at high levels. The relationship between teacher turnover and achievement could lead to a vicious cycle of high teacher turnover lowering student achievement, and lower student achievement increasing teacher turnover.

Teacher turnover comes at great expense, both in the impact on student achievement and the negative financial drain to the school districts. Teacher turnover drains schools of financial and human capital and forces school districts to spend money on recruiting, preparing, training, and supporting new teachers. Barnes, Crowe, and Schaefer (2007) estimates that teacher turnover costs schools in the United States more than seven billion dollars a year. Costs of teacher turnover for school districts include advertising, attending job fairs, paying signing bonuses and administrative expenses related to training of new teachers, mentoring, professional development, hiring substitutes, and preparing for separation.

Research was done on the working conditions in five large, urban school districts across the United States. The study concluded that the condition of school facilities has a direct effect on teacher morale, sense of personal safety, feelings of effectiveness in the classroom, and on the general learning environment. After major renovation of school facilities, teachers feel a renewed sense of hope, commitment, and a belief that the district cares about what goes on in the school facility. However, in dilapidated school facilities, teachers experience despair and frustration. Poor working conditions result in higher absenteeism, low morale, and reduced job satisfaction (Corcoran, Walker, & White, 1988). Further research needs to be done to examine the relationship between teacher turnover and the condition of school facilities.

Teachers who leave school districts and education in general often cite low salaries as one of the reasons for leaving. The largest salary gap exists between rural and metropolitan community types. Rural schools pay far less than urban and suburban schools. However, quality school facilities may have a positive impact on teacher turnover. Research has shown that "relatively better working conditions may compensate for lower salaries" (Hanushek & Rivkin, 2007, p. 72). In fact, working conditions, including facilities, safety, and quality of leadership have more affect on teacher mobility than teacher salary (Hanushek & Rivkin, 2007). Further study is needed to determine which working conditions are the most important for teacher retention.

The quality of a school's infrastructure can affect overall teacher effectiveness and teacher retention. Buckley et al. (2004) found that the quality of school facilities are important factors in teachers' job satisfaction and can affect the ability of teachers to teach, teacher morale, and the very health and safety of teachers. School districts with

inadequate facilities are less likely to attract and retain teachers (Schneider, 2004). Teacher turnover leads to hiring less experienced teachers. School districts cannot attract highly educated professionals and then require them to work in inadequate working conditions that can be detrimental to their health.

Student Attendance

Another important area of research among policy makers and educational leaders is the possible relationship between the condition of school facilities and student attendance. A common belief among educators and educational facility planners is that the condition of school facilities does indeed have an affect on the attendance of students.

A study of 226 schools in the Houston Independent School District concluded that schools in need of roof repair and schools with a high percentage of temporary buildings had lower student attendance rates. A school with 1000 students that utilizes at least five percent of its total facilities as temporary facilities can expect to lose one student per day in student attendance more than a school of the same size without temporary facilities (Branham, 2004).

The Houston study also found that schools in need of roof repair will have a negative affect on student attendance. A school with 1000 students in need of roof repair can expect a loss of 4-5 students a day in attendance than they would have had in school had the roof been structurally sound (Branham, 2004).

The Mexican-American Legal Defense Education Fund (MALDEF) reported that overcrowded schools lead to higher absenteeism rates for both students and teachers. These higher absentee rates have detrimental effects on children's ability to learn and perform well (PolicyLink, 2005).

Overcrowding is another serious problem with regard to student learning. Students in overcrowded school facilities score lower on achievement tests. In a study of 31 elementary, middle, and high school facilities in five major cities across the nation reported that overcrowding resulted in a high rate of absenteeism among teachers and students. Working conditions in overcrowded school facilities are stressful and unpleasant, resulting in the high rate of absenteeism (Corcoran, 1988).

School Facilities Funding

History of Texas School Facilities Funding

Until recently, school facilities funding in Texas has relied largely on local property taxes. The over-reliance on local property taxes led to great disparities in school facilities funding. A brief history of Texas school facilities funding will reveal several weak attempts by the state to equalize facilities funding for school districts.

There were several failed attempts to provide equalized funding for facilities construction during the first ninety years of the twentieth century. However, until the last decade of the century, funding of school facilities was basically left up to each local school district. Local funding was adequate for high-wealth districts, but low-wealth districts were left without the property wealth to fund necessary capital improvements. Many low-wealth districts cut operational funding to save the necessary money to upgrade facilities. When bond elections were held by low-wealth districts, the debt service tax rate was considerably higher than high-wealth districts in order to raise the same level of funding (Walker, 1998).

The first effort to fund school facilities by the state was a provision in the 1880's, when the Texas legislature permitted a fund commonly used for operating expenses to be

used for school construction. Eventually, the legislature authorized the State Board of Education to invest the Permanent School Fund in school district bonds in 1901 and 1909. State incentive aid for construction was made available to these county boards to consolidate common school districts into rural high school districts (Walker, 1988).

The Texas legislature passed the Gilmer-Aikin Act in 1949 to finance basic education for all students. The Gilmer-Aikin Committee that proposed the Gilmer-Aikin Act recommended legislation for equalized funding for facilities construction. However, legislators did not equalize facilities funding because they were expecting increased school consolidations to make more efficient use of existing facilities (Clark, 2001). In 1971, the Texas Legislature provided incentive aid for school facilities construction for those districts that agreed to consolidate. However, there were few districts that took advantage of this incentive aid (Texas Education Agency, 1994).

In the 1980's, there were several study groups that were convened to study the idea of state support for school district facilities, but no state assistance for facilities funding for schools was ever given by the state. Because of this lack of action by the legislature, several low-wealth school districts filed the first of several lawsuits against the state for equalized funding of schools. These low-wealth districts joined together to file *Edgewood ISD v. Kirby* (Commonly known as *Edgewood I)* in 1985. In 1987, the trial court found in favor of the *Edgewood* plaintiffs. Judge Harley Clark wrote:

> The Court hereby declares and enters Judgment that the Texas School Financing System is unconstitutional and unenforceable in law because it fails to insure that each school district in this state has the same ability as every other district to obtain, by state legislative appropriation or by

> local taxation, or both, funds for educational expenditures, including facilities and equipment….School facilities will present a major problem during the next decade. The problem is a state problem, and it will probably require state, as opposed to only local district resources, to produce an adequate solution (*Edgewood I.S.D., et al., v. Kirby*, 1987).

Several committees and task forces were formed to address the lawsuit. The 1988 Select Committee on Education, appointed by Governor Bill Clements, proposed that the state establish an emergency fund of $100 million for new equalized construction of school district facilities and a state program of facilities and debt service assistance. Another committee, the School Facilities Advisory Committee, was formed in 1989. This committee proposed a guaranteed yield system for school district construction funding for school districts that used cash for construction funding (Clark, 2001).

The 1989 Governor's Task Force on Public Education recommended that debt service be included in the guaranteed yield of the Foundation School Program (Tier II) and that it be increased from the current level. The Task Force also recommended that the Legislature appropriate $5 million to fund a statewide facilities inventory (Governor's Task Force on Public Education, 1990).

In 1990, the Texas Legislature charged the Texas Education Agency with conducting an inventory of Texas school facilities. The agency released a draft Building and Educational Technology Assessment (BETA) report in May, 1992. The BETA report estimated the amount needed to meet the school district facilities needs to be about $2.85 billion, and another $480 million annually needed to accommodate enrollment growth

and aging facilities. Senate Bill 1 addressed several *Edgewood* requirements in 1990, but it failed to equalize funding for facilities (Clark, 2001).

In 1991, the Legislature passed an Emergency Grant Program to fund projects of school districts that were considered to be emergencies. Less than $50 million was funded for projects such as repairing buildings damaged in tornados, flooding, etc. (Clark, 2001).

In 1993, Legislators passed Senate Bill 7 to address requirements in *Edgewood v. Kirby*. This legislation required high-wealth districts to reduce their wealth to a specified level. This revenue redistribution plan was commonly referred to as the "Robin Hood Plan" (Clark, 2001).

In 1994, an interim committee of the Texas Senate studying facilities funding recommended a separate guaranteed yield to fund facilities for schools. However, the Legislature, in 1995, only provided the School Facilities Assistance Program. This program provided grant-based assistance to low-wealth and fast growth school districts. This small grant-based program was insufficient, and it did not provide for equitable funding for school facilities (Clark, 2001).

The Texas Supreme Court has ruled on four *Edgewood* cases. Each ruling prompted the Legislature to create initiatives that would satisfy the Texas Constitution and provide equalized funding. Most of the legal battles centered on the following language in the Texas Constitution:

> A general diffusion of knowledge is essential to the preservation of the liberties and rights of the people….It shall be the duty of the Legislature of the State to establish and make suitable provision for the support and

> maintenance of an efficient system of public free schools" (Texas Constitution of 1876, Article VII, Section 1).

In 1995, the Texas Supreme affirmed the constitutionality of the school finance system enacted in Senate Bill 7. However, the Texas Supreme Court also specifically addressed the legislature's failure to establish an equalized program of state aid for school facilities:

> We emphasize, however, that the challenge to the school finance law based on inadequate provision for facilities fails only because of an evidentiary void. Our judgment in this case should not be interpreted as a signal that the school finance crisis in Texas has ended….An efficient system of public education requires not only classroom instruction, but also the classrooms where that instruction is to take place. These components of an efficient system—instruction and facilities—are inseparable….Indeed, the evidence at trial shows that the lack of a separate facilities component has the potential of rendering the school finance system unconstitutional in its entirety in the very near future.
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> (*Edgewood Independent School District v. Meno*, 1995).

In 1997, partially in response to the 1995 ruling by the Texas Supreme Court, the Legislature finally established a separate, equalized system for funding school facilities. This new facility funding program was established by passing House Bill 4 in 1997, more commonly known as the Instructional Facilities Allotment. Applications for IFA are considered according to the wealth of the district. Preference is given to low-wealth districts with no existing debt. IFA assistance is given to school districts based on the

amount needed to service the debt of the district. State assistance is limited to the lesser of $100,000, $250 per student, or the district's actual debt payment. Low-wealth districts receive equalized state assistance up to a combined local and state yield of $35 per pupil in average daily attendance (ADA) per penny of debt service tax up to 7.14 pennies for each IFA project. High-wealth districts are not eligible for IFA assistance. However, these districts are allowed to reduce their recapture amounts due to the state by the amount of their debt service payments (Texas Education Code, Chapter 46, Subsection A, 1997).

In 1999, the Legislature passed another program for funding facilities. This program, known as Existing Debt Allotment (EDA), provides for funding existing debt. This program provides for payments for bond issues that are not eligible for IFA funding. The EDA guarantees school districts $35 per pupil in average daily attendance (ADA) per penny of debt tax up to a maximum of $.29 cents of existing debt taxation. The result of IFA and EDA funding programs was to compress school district tax rates and increase school district spending for instructional facilities (Texas Education Code, Chapter 46, Subsection B, 2007).

The final state program to assist school districts is the New Instructional Facilities Allotment (NIFA). The NIFA was introduced in 1999 to provide funding to equip newly constructed instructional facilities. Schools are eligible to receive $250 per pupil allotment the first year a new school is open (Texas Education Code, Section 42.158, 2007).

Inequity of Texas School Facilities Funding

The Instructional Facilities Allotment only benefits low-wealth districts that are able to pass bond elections. However, many low-wealth districts do not benefit from the IFA assistance, because they are not "poor enough" to qualify to receive part of the small amount of funds in this program. Other low-wealth districts have a difficult time passing bond elections because of their low property wealth, so they do not even qualify to apply for the IFA program (Dawn & McLaughlin, 1996).

IFA funds are awarded starting with the school district with the lowest property wealth per student and ascending until the funds are exhausted. The IFA funding over the past 10 years has been so inconsistent that the districts IFA was designed to help cannot depend on it. The Legislative Budget Board acknowledges the uncertainty of IFA funding by stating that "a high percentage of IFA eligible applications do not get funded from round to round" (Legislative Budget Board, 2006, p. 13).

The equity level for the Existing Debt Allotment (EDA) is so low that in 2005-2006, fewer than 75% of the state's students are in school districts with equal access to funds. This is in contrast to the 91% equity level in the 1999-2001 biennium, the first biennium the EDA was available. As the wealth level of the state rises, the equity level for schools participating in either the IFA or EDA facilities funding programs drops due to the frozen yield of $35. Wealthy school districts have rising yields due to the rising wealth of the state. The provision of recapture does not apply to local funds for building new facilities or to the retirement of current debt (Texas Education Code, Section 46.003, 1997). The districts in the top five percent of wealth yield $70.47 per penny, as opposed to $35 per penny for IFA or EDA districts (Equity Center, 2006). The lack of recapture of these

facilities funds creates an inequitable situation for school facilities funding. Low-wealth districts are capped at $35 per penny for funding, while high-wealth districts are free to tax at an unlimited wealth level.

The IFA and EDA programs have decreased the disparity between the poorest and wealthiest school districts for facilities funding, except for the highest five percent of districts. However, because of the small amount of funding for these programs, the impact on overall equity in school funding is small (Clark, 2001).

In 2003, the Texas Supreme Court ruled once again on a lawsuit brought by a group of Texas public schools. In that court case, commonly known as *West Orange Cove I*, the Supreme Court ruled that there was plenty of evidence that many of the school facilities in the state were inadequate. However, the state argued that simply because there were disparities in facilities in Texas was not proof of inefficiency. The state said that facilities needs vary too widely for schools, depending on the size and location of the schools. The state contended that no proof was submitted to prove that a general diffusion of knowledge was not possible without additional facilities (*West Orange Cove Consolidated Independent School District vs. Alanis*, 2003).

The court declared that the only requirement for efficiency was for schools to have substantially equal access to revenue for facilities. The court ruled that it was not unconstitutional for schools to supplement their programs with local funds, even if they were unmatched by state dollars. It was the opinion of the court that these supplemental funds were beyond that which was required for constitutional adequacy. As such, the state was not obligated to provide substantially equal access to these supplemental funds (*West Orange Cove Consolidated Independent School District vs. Alanis*, 2003).

A possible solution to equalize funding for facilities between low-wealth and high-wealth districts is to institute a recapture system for bonded indebtedness and capital expenditures for high-wealth districts. Currently, the State of Texas does not recapture revenue from wealthy school districts for the purpose of bonded indebtedness. Consequently, property-wealthy rural school districts can raise a significantly larger amount of revenue for bonded indebtedness than property-poor school districts.

School Facilities Litigation in Other States

There have been numerous court cases outside the state of Texas over the last couple of decades regarding school facilities funding. Recent court cases in Missouri, South Carolina, Arkansas, Massachusetts, Nebraska, Montana, Montana, California, Arizona, Kansas, New York, Louisiana, Pennsylvania, Georgia, Michigan, and Oklahoma are among the most recent challenges emphasizing the importance of facilities as an essential component of student learning (Campaign for Fiscal Equity, 2004).

One of the longest running battles over school finance has occurred in Wyoming. The funding lawsuits in Wyoming began in the 1970's. In 1980, the Wyoming Supreme Court found the state's public school finance system unconstitutional. The Court held that the public school finance system must utilize total state resources for building construction on parity for all school districts (*Campbell County School Dist. v. State*, 2008).

The second round of the battle came in 1995, when the Wyoming Supreme Court again found the public school finance system unconstitutional because the funding system resulted in wealth-based disparities in school construction financing. In 2001, the Wyoming Supreme Court ruled the new school finance system constitutional, but a few items were sent back to the legislature for further review. One of the most significant

items sent back for further review was the issue of capital funding of school districts. The Court found that a proper education could not be adequately delivered to children who attended schools that had long been denied adequate maintenance and construction funding (*Campbell County School Dist. v. State*, 2008).

Over the next several years, the Wyoming legislature adopted a new public school capital construction system and set aside about $990 million for public school capital construction. In 2008, as a result of this new allocation of capital funds, the Wyoming Supreme Court finally found that the school finance system of Wyoming was in full compliance with the state constitution. The only issue on which the Supreme Court disagreed with the district court was that the Appellate Court reversed the district court's ruling that the state could not limit the size of school buildings. The Wyoming Supreme Court found that the state had a compelling state interest in achieving equality in facilities. The Court repeated its finding that similarly situated students should have access to similar facilities (*Campbell County School Dist. v. State*, 2008).

Conceptual Framework

This study was based upon the analysis of the relationship between the condition of school facilities and educational outcomes. A review of the literature in the second half of the twentieth century revealed a range of thought from researchers. On one end of the spectrum is the concept that the condition of school facilities account for little of the variation in student achievement, and that the most important factors associated with student achievement is family influence. The other end of the research spectrum asserts that there is a significant relationship between school facilities spending and educational outcomes.

Several studies concluded that even though most of the influence on educational outcomes is the result of demographics and family influences, the school still has a significant impact on student outcomes, particularly when the studies focus on how the school districts spend their money rather than on the amount of money school districts spend.

Coleman, Campbell, Hobson, McPartland, Mood, Weinfield, et al. (1966) authored the well-known report called Equality of Educational Opportunity. This report, commonly referred to as the Coleman Report, was the most famous of a series of studies in the second half of the twentieth century regarding the conceptual framework of the factors that affect educational outcomes. The Coleman Report found that schools accounted for little of the variation in student achievement. The report claimed that family influence was the most important factor associated with student achievement. This report brought the importance of the relationship between resources and educational outcomes to the nation's attention.

Garrett (1980) was one of the first researchers to study the relationship of facilities and student outcomes. Garrett reported that although much of the variance in student achievement has been attributed to socioeconomic factors rather than the condition of facilities, a small amount of variance can be explained by the age of facilities. Garret formulated a theoretical framework organized around the following basic postulates:

1. Students are directly influenced by their learning environment.
2. Teacher/student ratios are affected by the learning environment.
3. Teacher retention is affected by the learning environment.
4. Student productivity is affected by the learning environment.

With school districts increasingly facing public demands of higher accountability and more efficient utilization of tax monies for public education, many researchers began to

see the importance of studying the relationships between school inputs and student achievement. One of the most notable of these researchers, Eric Hanushek, analyzed several studies conducted over a 15-year period. Hanushek found that there was not a significant relationship between school expenditures and student performance. One of the seven educational inputs Hanushek studied was facilities. Hanushek found that facilities played little role in the achievement of students (Hanushek, 1989).

Another group of researchers disputed the results of such studies as the Coleman Report and Hanushek's analysis. Hedges, Laine, and Greenwald (1992) analyzed the same studies as Hanushek using meta-analysis, instead of merely tallying votes as in Hanushek's studies, and found a significant relationship between student performance and educational spending.

Several researchers in the last fifteen years have depicted the conceptual framework as a relationship between the condition of school facilities and student outcomes. Cash showed several factors that can be attributed to the circumstances that affect building condition, such as available revenue for education; the value the community places on education; and educational leadership. Variations on the Cash model show how school facilities may directly and indirectly affect student outcomes. Direct impact of student outcomes may come from such variables as temperature control, lighting, acoustics, overcrowding, etc. Indirect impact of student outcomes may come from attitudes of educational leaders, parents, faculty, and students (Cash, 1993).

The condition of school facilities "may have a stronger effect on student performance than the combined influences of family background, socioeconomic status, school attendance, and behavior" (Lyons, 2001, p. 7). A study by Lewis (2001) confirmed

Lyons' research by finding that when individual ability of students was controlled, facility condition can explain as much of the differences in test performance as family background and school attachment. Additional research is warranted to verify this extremely important assertion.

Earthman, Cash, and Berkum (1995) used a methodology similar to Cash's methodology to study the relationship between the condition of school facilities and student achievement in all one hundred ninety-nine high school facilities in North Dakota. The state of North Dakota was selected for basically two reasons. The first reason was because students in North Dakota traditionally score among the highest in the nation on the Scholastic Achievement Test (SAT). The second reason was because the state has a mostly rural population with similar demographic characteristics. Earthman's results were not as statistically strong as Cash's results, but the results still supported the conclusion that there is a relationship between the condition of school facilities and student performance on achievement tests.

Carpenter (1996) developed a Structural Equation Model to study the relationship between the amounts of money spent in specific categories to student achievement. Carpenter's study found that some spending components have a stronger relationship to student performance than others. A strong positive relationship existed between standardized achievement test scores and ACT/SAT performance. Carpenter also found a strong positive relationship between supplies and materials and contracted services and standardized achievement test scores.

Lanham (1999) studied the relationship between building and classroom conditions and student achievement in Virginia's elementary schools. Lanham concluded that the

socioeconomic status of the students explained most of the variance in student achievement. However, improving certain building and cosmetic components explained some of the variance and can also improve student achievement.

Schneider (2002) studied the relationship between the condition of school facilities and student achievement in Washington, D.C. and Chicago, Illinois. Schneider found that improving facilities may be just as significant in improving student performance as reducing school size. After controlling statistically for factors such as demographics and income, the results indicated that good facilities are linked to better test scores. Students attending schools with facilities in good condition performed 3 to 4 percentage points better on reading and math than students attending schools with facilities in poor condition.

Wong and Shen (2002) found that higher levels of state funding are significantly related to narrowing the gap between high-wealth school districts and low-wealth school districts. When there is less dependence on local property tax revenue, high-wealth school districts will no longer have a funding advantage over low-wealth school districts. The state will then be able to distribute state revenue to those school districts that need it the most.

Chapter Summary

The first section in this chapter described the condition of school facilities. The second section described more specifically the condition of rural school facilities. The third section described the demographic characteristics of high schools used in this study. The fourth section described the educational outcomes used in this study. The last section

outlined the history, inequity, and litigation of school funding in Texas and the United States.

The literature revealed that there are widespread deficiencies in many school facilities in the United States. The General Accounting Office reported that almost 60% of schools in the United States had at least one major building feature that needed to be repaired, overhauled, or replaced (General Accounting Office, 1996b).

The National Center for Educational Statistics (2000) reported that one in four public schools are overcrowded. Earthman (2002) found that overcrowded school facilities have a negative influence on student performance of low-income and minority students.

The literature revealed that portable classrooms serve the purpose of relieving overcrowded conditions of school facilities, but too often these "temporary" solutions become permanent structures and remain in place for 20 to 40 years (National Center for Education Statistics (2000).

The literature revealed that the schools with the poorest facilities are often the schools with the highest percentages of minority and low-income students. Many low-wealth school districts have more portable facilities than school districts with high property value per student.

Litigation in Texas and the United States has had an impact on the funding for school facilities. Through many court cases around the country, there has been a shift in focus from equity in education to adequacy in education. This shift in focus has done little to improve the funding for facilities for schools in Texas and across the country.

This review of research found that older school facilities are more prevalent in schools with a higher percentage of low-income children than those with a higher percentage of

high-income children. The state of Texas must shoulder more of its responsibility and increase its share of facilities funding for public schools. Without additional equalized school facilities funding from the state, many of the state's poorest rural districts will continue to educate their students in dilapidated, decaying, and outdated school facilities that may endanger the physical safety of children and deprive them of a quality education.

Education is a state responsibility (Texas Constitution, Article VII, Section 1, 1876). The state has the moral and legal obligation to provide quality school facilities so that all children will have substantially equal access to educational opportunities. As long as students continue to be disadvantaged by being educated in substandard facilities, advocates for children everywhere must continue to call for equity in our public educational system. If there truly is a relationship between the condition of school facilities and educational outcomes, the state must ensure that all children attend public schools with quality school facilities.

CHAPTER III

METHODOLOGY

Introduction

This study examined the relationship between the condition of rural public high school facilities in Texas and student achievement, student attendance, and teacher turnover, while controlling for the effects of the demographic variables of student wealth level (percent economic disadvantage students), school district wealth level (property value per student), and percent minority students in the high schools. This chapter described the data, variables, and methodology used in this study to answer the research question.

Description of Data

Participants in the Study

The participants in the study included small Rural and Non-Metro: Stable public high schools in Texas, excluding non-taxing public school districts and charter schools. These school districts were selected from the sample of school districts responding to the 2006 Texas Comptroller's Facility Survey. The Comptroller's Survey was sent to all 1,037 taxing and non-taxing public school districts and charter schools in Texas. There were 309 school districts that responded to the survey. These school districts represent 48.1% of the state's student population.

The Comptroller's Study utilized several categories as the Primary Use of Facility. Examples of different Primary Uses include Instruction, Administrative, Warehouse, Extra-curricular, etc. Only data from the Primary Use Category "Instruction" were used in the data analysis for this research. There were no extra-curricular facilities,

warehouses, storage facilities, etc. used in this study unless they were a part of the high school building.

After eliminating eight schools for partial responses, there were 136 school districts that fell into the category of small rural and non-metro: stable school districts. Of these 136 school districts, 64 schools housed multi-grade classrooms from Kindergarten through 12th grade. This study eliminated these schools, because student achievement data is more meaningful when examined by individual grade, rather than average the data over the entire school. Having all of the grades in one building makes it very difficult to collect the appropriate data. It would be difficult to measure the effects of condition of facilities on student achievement when a school may have two different TAKS scores for the high school and elementary, yet only one value for the condition of the one building.

There were 72 districts that housed their high schools in separate facilities from other grade levels. These 72 districts also had separate student achievement data from the Texas Education Agency for their high schools, instead of combining such data with other grade levels.

Although this was a relatively small number of respondents for a research study, 72 high schools were appropriate for this study because these similar districts provided a quality sample for determining the relationship between the condition of school facilities and educational outcomes. In addition, it was an appropriate number of schools because studies involving similar school districts in terms of geographic locations, student demographics, available funds, and school size provide a better data fit with a smaller sampling error than the large sample size studies (Carpenter, 1996).

Research Instrument

This research used a quantitative methodology of data analysis. The study examined the responses from the 2006 Texas Comptroller's Facility Survey, *Current and Future Facilities Needs of Texas Public School Districts*. A copy of the survey used in this study can be found in Appendix A. This survey was developed and tested by representatives with facilities expertise from the Texas Association of School Administrators (TASA), Texas Association of School Boards (TASB), Texas Association of School Business Officials (TASBO), the Texas Education Agency (TEA), the executive directors and staff of the state's 20 Regional Education Service Centers (RESCs).

In 2006, at the request of State Senator Eddie Lucio, Jr., Texas Comptroller Carole Keeton Strayhorn conducted a survey of all public school districts in Texas. The survey gathered information about current and future facility needs in Texas public schools. A copy of Senator Lucio's request can be found in Appendix B. Information about the condition of school facilities from that survey will be applied to certain educational outcomes of the school districts. The data gathered in the Comptroller's Facility Study lend themselves well to a quantitative analysis of the data. The complexity and number of different variables and categories of data point to quantitative statistical analysis of the data for this study.

Data Collection Method

Data used in this study was collected by a survey instrument developed by the Texas Comptroller of Public Accounts, in collaboration with representatives from the Texas Association of School Administrators (TASA), Texas Association of School Boards (TASB), Texas Association of School Business Officials (TASBO), the Texas Education

Agency (TEA), the executive directors of the state's 20 Regional Educational Service Centers (RESCs), and individuals with facilities expertise. The Comptroller's Facility Study survey was then tested at the 2006 TASBO convention by several volunteer districts. The volunteer districts were asked to compile the requested information and to provide feedback with concerns and suggestions for improvement.

The Texas Comptroller of Public Accounts sent a letter to all public school districts and charter schools in Texas on May 1, 2006, announcing the survey and directing the schools to the online survey questionnaire. A copy of the letter from the Texas Comptroller of Public Accounts can be found in Appendix C. The initial deadline for return of the surveys was June 30, 2006. However, in late June, the deadline was extended to July 31, 2006. The survey was left online for two additional weeks following the deadline to allow school districts to submit additional data.

The facility inventory survey was submitted via e-mail in an Excel spreadsheet format. The survey was available online on the web site of the Texas Comptroller of Public Accounts from May 1, 2006 through August 15, 2006. Training sessions were provided to school personnel at 16 of the 20 Regional Educational Service Centers on how to complete the survey. The Comptroller's staff members called over 500 school districts in late June requesting their participation and offering assistance. Although the survey was voluntary, there were several attempts by the Comptroller's staff to encourage school district personnel to respond to the survey. There were 309 public school districts and charter schools that responded to the Comptroller's request. Eight responses included partial responses and were not included in the results. One school response was a non-taxing entity, and it was not included in the results.

The Comptroller's Facility Study was objective in nature and therefore appropriate to be used in the quantitative analysis of data. The surveys were sent to all school districts in the state of Texas giving each district an equal opportunity to respond.

The 2006 Academic Excellence Indicator System (AEIS) report from the Texas Education Agency provided the demographic data of student wealth level by listing the percent of students classified as economic disadvantaged students, commonly referred to as the percent of students who qualify for the federal free- or reduced-lunch program.

The 2006 Academic Excellence Indicator System (AEIS) report from the Texas Education Agency provided the percent of minority students. The percent of minority students was calculated by subtracting the percent of white students at each high school from 100.

The Texas Education Agency provided the school district wealth level. The Texas Education Agency used the Comptroller's Property Tax Division (CPTD) taxable value per student for each school district.

The average years experience of teachers with district was used as a proxy for teacher turnover. The Texas Education Agency does not provide teacher turnover data at the individual high school level. teacher turnover data is only provided for the school district level. However, average years experience of teachers with district at each high school is reported by the Texas Education Agency at the high school level. Therefore, this study utilized average years experience of teachers with district for high school teachers as a proxy for teacher turnover for each high school.

The 2006 AEIS report provided the data for student achievement as TAKS met 2006 standard 11^{th} all tests.

The 2006 AEIS report provided the data for student attendance rate for each high school.

The Comptroller's Study utilized several categories as the Primary Use of Facility. Examples of different Primary Uses for school facilities include Instruction, Administrative, Warehouse, Extra-curricular, etc. This study only used data from the Primary Use Category Instruction in the data analysis for this research. There were no extra-curricular facilities, warehouses, storage facilities, etc. used in this study unless they were not separate from the high school building.

Predictor Variables

The predictor variables used in this study included six condition of facilities variables and three demographic variables.

Condition of Facilities Variables

General condition of school facilities. The general condition of school facilities variable was the only variable used in the Facility Study survey that might be construed as subjective in nature. However, clear definitions were given to the survey responders to make this question as objective as possible. These definitions included the following: E = Excellent, no major repairs are needed; G = Good, some repairs may be beneficial but the facility is structurally and educationally sound; F = Fair, major repairs are needed, but the building's condition does not impair student learning or staff/student safety; P = Poor, the condition of the facility impairs student learning and staff/student safety; N = Needs Replacement, needed repairs are extensive and the cost to make the facility safe and structurally and educationally sound exceeds the cost of replacement.

Percent portable to total square feet per student. The percent portable to total square feet per student variable was calculated by dividing the responses for the square feet of portable square feet per student by the total square feet per student, then multiplying by 100.

Percent (over) under capacity. The percent (over) under capacity variable served to define the amount of overcrowding in the school. Percent (over) under capacity was calculated by subtracting the number of students enrolled from the capacity of the facility, then dividing the result by the capacity of the facility, and then multiplying the result by 100.

Average age of facilities. The average age of facilities variable was calculated by subtracting the responses for the years the facilities were built from 2006 and then averaging the results.

Number of years since last renovation. The number of years since last renovation variable was calculated by subtracting the responses for the year that the facility was last renovated from 2006, and then averaging the results.

Percent deferred maintenance. The percent deferred maintenance variable was calculated by subtracting the responses for the 2006 maintenance budget from the total reported maintenance needs, and then dividing by the total reported maintenance needs, and multiplying the result by 100.

Demographic variables

Percent minority students. The percent minority students variable was measured by subtracting the percent of students classified as *white* who were enrolled in the high

school from 100%. This data was obtained from the 2006 Academic Excellence Indicator System (AEIS) Report of the Texas Education Agency.

Student wealth level. The student wealth level variable was measured by the percent of students qualifying for the federal free- and reduced-lunch program at the high school. This data was obtained from the 2006 Academic Excellence Indicator System (AEIS) Report of the Texas Education Agency.

School district wealth level. The school district wealth level variable was measured by the Comptroller's Property Tax Division (CPTD) district property value per student. This data was obtained from the 2006 Academic Excellence Indicator System (AEIS) Report of the Texas Education Agency.

Criterion Variables

Student Achievement

The student achievement variable was measured by the TAKS met 2006 standard 11th grade all tests taken score from the 2006 Academic Excellence Indicator System (AEIS) Report of the Texas Education Agency.

Teacher Turnover

Teacher turnover was not reported at the school level by the Texas Education Agency (TEA). However, the average years experience of teachers with district is reported by TEA for each school. Since there is only one high school in every school district in this study, the average years experience of teachers with district variable can serve as a proxy for teacher turnover.

Student Attendance

The student attendance variable was measured by percent student attendance for each high school as reported in the 2006 Academic Excellence Indicator System (AEIS) Report of the Texas Education Agency.

Data Analysis Methods

The study utilized descriptive and inferential statistics to analyze the relationship between the condition of school facilities and certain educational outcomes. The study used multiple regression to explore selected school facilities variables and demographic variables which were hypothesized to attribute to the variations in the educational outcomes of student achievement, teacher turnover, and student attendance. The research question studied was: What is the relationship between the condition of school facilities and certain educational outcomes, particularly in rural Texas public high schools?

Multiple Regression Analyses

In order to answer this question, multiple linear regression analyses utilizing the forward method were conducted to determine the best predictors of educational outcomes from conditions of public high school facilities and demographic characteristics of the school. The forward method is a procedure where each variable is considered one at a time. The first variable selected for the regression model is the predictor variable that has the highest correlation with the criterion variable. The next predictor variable selected is the one with the highest part correlation with the criterion variable, with the effects of the first variable partialed out. This variable will account for the greatest amount of the remaining variance in the criterion variable after the effect of the first predictor variable has been removed (Hinkle, 2003).

The next predictor variable is similarly selected. When a predictor variable entered the regression model, it remained in the model regardless of whether it continued to contribute to the regression as other predictor variables are entered. The forward solution is terminated when the increase in R Squared is no longer statistically significant or all the predictor variables are included, whichever occurs first. The forward method resulted in showing only those predictor variables that accounted for a significant proportion of the variance in the criterion variables Hinkle, 2003). The Statistical Program for the Social Sciences (SPSS 12.0 for Windows Student Version, 2003) was utilized to conduct the multiple regression analyses.

Student achievement. In the first multiple regression equation, student achievement (average TAKS scores) served as the criterion variable. Student achievement was measured by the TAKS met 2006 standard 11^{th} grade all tests taken score from the 2006 Academic Excellence Indicator System (AEIS) Report from the Texas Education Agency for each high school.

The predictor variables included: general condition of school facilities; percent portable to total square feet per student; percent (over) under capacity; average age of facilities; number of years since last renovation; percent deferred maintenance; property value per student; percent economic disadvantage students; and percent minority students.

Teacher turnover. In the second multiple regression equation, teacher turnover served as the criterion variable. Teacher turnover was measured by a proxy, average years experience of teachers with district. Measures for average years experience of

teachers with district were obtained from the 2006 AEIS Report from the Texas Education Agency for each high school.

Predictor variables included general condition of school facilities, percent portable to total square feet per student, percent (over) under capacity, average age of facilities, number of years since last renovation, percent deferred maintenance, property value per student, percent economic disadvantage students, and percent minority students.

Student attendance. In the third multiple regression equation, student attendance served as the criterion variable. Student attendance was measured by average percent student attendance obtained from the 2006 AEIS Report from the Texas Education Agency for each high school.

The predictor variables included: general condition of school facilities, percent portable to total square feet per student, percent (over) under capacity, average age of facilities, number of years since last renovation, percent deferred maintenance, property value per student, percent economic disadvantage students, and percent minority students.

Reliability, Validity, and Transferability

Reliability refers to the consistency of the scores obtained for each participant from one set of survey items to another. All of the questions on the Comptroller's Facility Study were objective in nature with regard to the condition of school facilities. Clear definitions were given for those questions that could be construed as subjective. For example, the analysis of facility condition utilized several definitions that resulted in better reliability for the study. Acceptable values for facility condition were given: E = Excellent, no major repairs are needed; G = Good, some repairs may be beneficial but the

facility is structurally and educationally sound; F = Fair, major repairs are needed, but the building's condition does not impair student learning or staff/student safety; P = Poor, the condition of the facility impairs student learning and staff/student safety; N = Needs Replacement, needed repairs are extensive and the cost to make the facility safe and structurally and educationally sound exceeds the cost of replacement.

Individuals who completed the survey included professional school district personnel that had expertise in the field of facility management. Using professional school district personnel to complete the survey helped to insure reliability of the findings. Every school district in Texas was asked by the State Comptroller of Public Accounts to complete the Comptroller's Facility Survey. Knowing that the results of this survey were official reporting documents sent to the Texas Comptroller of Public Accounts and requested by Texas Senator Eddie Lucio, Jr., should increase the reliability of participating school district administrative personnel.

Validity refers to how well the survey instrument accomplished the purpose for which it is used. When a study has internal validity, the relationship between the variables studied is not due to something for which the researcher did not control or account.

Validation of the survey instrument was established in several ways. The State Comptroller of Public Accounts gathered information for the Facility Study survey in cooperation with representatives of school districts with expertise in school facilities management. Review committees were formed comprised of representatives from the Texas Association of School Administrators (TASA), Texas Association of School Boards (TASB), Texas Association of School Business Officials (TASBO), the Texas

Education Agency (TEA), the executive directors of the state's 20 Regional Educational Service Centers (RESCs), and individuals with facilities expertise.

The Comptroller's Facility Study survey was then tested at the 2006 TASBO convention by several facility experts from volunteer districts. The volunteer districts were asked to compile the requested information on the survey and to provide feedback with concerns and suggestions for improvement. Final revisions were made to the survey by the Comptroller's office before being sent to all school districts in the state of Texas.

There is a small amount of self-selection bias in the sample of high schools used in this study. The Comptroller's Survey was not mandated by statute by the legislature. The Texas Comptroller of Public Accounts sent a letter to every school district in Texas encouraging school districts to submit this information. However, submission of the survey was entirely voluntary.

This chapter described the data, variables, and methodology used in this study to answer the research question.

CHAPTER IV

RESULTS

Introduction

This chapter described the results from the analysis of data that were used to address the research question. Sections of this chapter included: (a) presentation of the data, including descriptive statistics for the study variables and (b) data analysis using multiple regression analyses.

The purpose of this study was to examine the relationship between the condition of rural public high school facilities in Texas and the educational outcomes of student achievement, student attendance, and teacher turnover, while controlling for the effects of the demographic variables of student wealth level (percent of economic disadvantage students), school wealth level (property value per student), and percent minority students. Data were taken from the 2006 Texas Comptroller's Facility Study Survey.

Presentation of the Data

There were 309 school districts that responded to the survey. There are 136 school districts that fall into the category of small Rural and Non-Metro: Stable school districts. Of these 136 school districts, 64 school districts have very small student populations. These 64 school districts have all Kindergarten through 12th grade students in one building, which made it very difficult to obtain data for only the high school. This study only used data from high schools. 72 school districts house their high schools in separate facilities from other grade levels. These 72 high schools were the participants in this

study. The mean (*M*), range, standard deviations (*SD*), and minimum and maximum scores are presented in Table 4.1.

Predictor Variables

Condition of Facilities. The mean for average age of facilities was 34.72, *SD* = 19.93. The range for average age of facilities was 75.00 with values between minimum (3.00) to maximum (78.00). The mean for average number of years since last renovation was 9.81, *SD* = 10.34. The range for number of years since last renovation was 47.00 with values between minimum (0.00 to maximum (47.00). The mean for percent (over) under capacity was 26.17, *SD* = 18.56. The range for percent (over) under capacity was 87.11 with values between minimum (-6.25) to maximum (80.86). The mean for percent portable to total square feet per student was 1.11, *SD* = 2.38. The range for percent portable to total square feet per student was 14.63 with values between minimum (0.00) to maximum (14.63). The mean for condition of facilities was 3.74, *SD* = .92. The range for condition of facilities was 4.00 with values between minimum (1.00) to maximum (5.00). The mean for percent deferred maintenance was 37.18, *SD* = 39.36. The range for percent deferred maintenance was 100.00 with values between minimum (0.00) to maximum (100.00).

Demographic characteristics. The mean for percent economic disadvantage students was 45.58, *SD* = 17.12. The range for percent economic disadvantage students was 88.04 with values between minimum (9.91) to maximum (97.95). The mean for property value per student was 275,193.89, *SD* = 275,246.42. The range for property value per student was 1,457,257.80 with values between minimum (23,290.47) to maximum (1,480,548.27). The mean for percent minority students was 40.60, *SD* =

26.58. The range for percent minority students was 97.13 with values between minimum (2.36) to maximum (99.49).

Criterion Variables

The mean for average TAKS scores was 66.58, *SD* = 11.62. The range for average TAKS scores was 60.00 with values between minimum (28.00) to maximum (88.00). The mean for average percent student attendance was 94.99, *SD* = 1.37. The range for average percent student attendance was 6.30 with values between minimum (90.82) to maximum (97.12). The mean for average years experience of teachers with district was 7.11, *SD* = 1.95. The range for average years experience of teachers with district was 8.95 with values between minimum (2.23) to maximum (11.18).

Table 4.1. Descriptive Statistics

Variables	Range	Minimum	Maximum	Mean	Std. Deviation
Predictor Variables:					
Avg Age	75.00	3.00	78.00	34.72	19.93
Last Renov	47.00	.00	47.00	9.81	10.34
% (Over)Under Capacity	87.11	-6.25	80.86	26.17	18.56
%Port/Perm	14.63	.00	14.63	1.11	2.38
Gen Condition	4.00	1.00	5.00	3.74	0.92
%Defer Maint	100.00	.00	100.00	37.18	39.36
Econ Disad	88.04	9.91	97.95	45.58	17.12
PropVal/Pupil	1,457,257.80	23,290.47	1,480,548.27	275,193.89	275,246.42
%Minority	97.13	2.36	99.49	40.60	26.58
Criterion Variables:					
Avg TAKS Scores	60.00	28.00	88.00	66.58	11.62
Avg Attendance	6.30	90.82	97.12	94.99	1.37
Avg Experience	8.95	2.23	11.18	7.11	1.95

N=72

Data Analysis Using Multiple Regression Analyses

The results in the following sections present an evaluation of which condition of facilities variables and demographic variables best predicted student achievement, teacher turnover, and student attendance.

The research question studied was: What is the relationship between the condition of school facilities and certain educational outcomes, particularly in rural Texas public high schools?

In order to answer this question, multiple linear regression analyses utilizing the forward method were conducted to determine the best predictors of educational outcomes from conditions of public high school facilities.

The selected condition of facilities variables were hypothesized to attribute to the variations in certain educational outcomes. The predictor variables included: general condition of school facilities; percent portable to total square feet per student; percent (over) under capacity; age of facilities; number of years since last renovation; percent deferred maintenance; property value per student; percent economic disadvantage students; and percent minority students. The criterion variables included: student achievement (average TAKS scores), teacher turnover (average years experience of teachers with district), and average percent student attendance.

Student Achievement

The first criterion variable examined in this study using multiple regression analysis was student achievement as measured by average TAKS scores. Tables 4.2, 4.3, and 4.4 reported the results of multiple regression analyses for average TAKS scores and each of the predictor variables mentioned previously for the responses from the 72 high schools

selected. Multiple regression results indicated that the linear combination of one demographic variable and three condition of facilities measures was significantly related to average TAKS scores, $F(4,67) = 12.008$, $p < .01$. The total R Square Change of .417 for the sum of these predictors indicates that, taken together, the inclusion in the regression equation of percent economic disadvantage students, average age of facilities, percent portable to total square feet, and percent deferred maintenance contributed approximately 42% of the variance in average TAKS scores. Standardized and unstandardized multiple coefficients (Beta-values and *B*-values) of the final multiple regression equation are summarized in Table 4.4.

Table 4.2. Model Summary for Multiple Regression for Average TAKS Scores

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.534(a)	.285	.275	9.96645	.285	27.891	1	70	.000
2	.575(b)	.330	.311	9.71479	.045	4.674	1	69	.034
3	.616(c)	.380	.352	9.41777	.049	5.421	1	68	.023
4	.646(d)	.418	.383	9.19403	.038	4.350	1	67	.041

a Predictors: (Constant), % ECONOMIC DISADVANTAGED
b Predictors: (Constant), % ECONOMIC DISADVANTAGED, PORTABLE TO TOTAL SqFt
c Predictors: (Constant), % ECONOMIC DISADVANTAGED, PORTABLE TO TOTAL SqFt, AVG AGE OF FACILITIES
d Predictors: (Constant), % ECONOMIC DISADVANTAGED, PORTABLE TO TOTAL SqFt, AVG AGE OF FACILITIES, % DEFERRED MAINTENANCE

Table 4.3. ANOVA for Multiple Regression for Average TAKS Scores

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2770.387	1	2770.387	27.891	.000(a)
	Residual	6953.113	70	99.330		
	Total	9723.500	71			
2	Regression	3211.479	2	1605.740	17.014	.000(b)
	Residual	6512.021	69	94.377		
	Total	9723.500	71			
3	Regression	3692.276	3	1230.759	13.876	.000(c)
	Residual	6031.224	68	88.694		
	Total	9723.500	71			
4	Regression	4059.982	4	1014.996	12.008	.000(d)
	Residual	5663.518	67	84.530		
	Total	9723.500	71			

a Predictors: (Constant), % ECONOMIC DISADVANTAGED
b Predictors: (Constant), % ECONOMIC DISADVANTAGED, PORTABLE TO TOTAL SqFt
c Predictors: (Constant), % ECONOMIC DISADVANTAGED, PORTABLE TO TOTAL SqFt, AVG AGE OF FACILITIES
d Predictors: (Constant), % ECONOMIC DISADVANTAGED, PORTABLE TO TOTAL SqFt, AVG AGE OF FACILITIES, % DEFERRED MAINTENANCE
e Dependent Variable: AVERAGE TAKS SCORES

Table 4.4. Coefficients for Multiple Regression for Average TAKS Scores

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	83.132	3.346		24.842	.000	76.458	89.807			
	% ECONOMIC DISADVANT	-.363	.069	-.534	-5.281	.000	-.500	-.226	-.534	-.534	-.534
2	(Constant)	82.585	3.272		25.241	.000	76.058	89.112			
	% ECONOMIC DISADVANT	-.324	.069	-.477	-4.682	.000	-.462	-.186	-.534	-.491	-.461
	PORTABLE TO TOTAL SqFt	-1.082	.501	-.220	-2.162	.034	-2.081	-.084	-.343	-.252	-.213
3	(Constant)	77.827	3.773		20.627	.000	70.298	85.356			
	% ECONOMIC DISADVANT	-.317	.067	-.467	-4.721	.000	-.451	-.183	-.534	-.497	-.451
	PORTABLE TO TOTAL SqFt	-1.182	.487	-.241	-2.427	.018	-2.155	-.210	-.343	-.282	-.232
	AVG AGE OF FACILITIES	.131	.056	.223	2.328	.023	.019	.243	.215	.272	.222
4	(Constant)	80.699	3.932		20.522	.000	72.850	88.548			
	% ECONOMIC DISADVANT	-.351	.068	-.517	-5.194	.000	-.486	-.216	-.534	-.536	-.484
	PORTABLE TO TOTAL SqFt	-1.138	.476	-.232	-2.390	.020	-2.088	-.187	-.343	-.280	-.223
	AVG AGE OF FACILITIES	.158	.056	.269	2.794	.007	.045	.270	.215	.323	.261
	% DEFERRED MAINT	-.061	.029	-.206	-2.086	.041	-.120	-.003	-.023	-.247	-.194

a Dependent Variable: AVERAGE TAKS SCORES

Student wealth level. The demographic variable, student wealth level, as measured by percent economic disadvantage students, accounted for most of the variance in the average TAKS scores. The sample multiple correlation coefficient was .534. The resulting R Square Change of .285 for the percent economic disadvantage students indicates that approximately 29% of the average TAKS scores can be accounted for by the percent economic disadvantage students, $F(1,70) = 27.891$, $p < .01$. The negative

regression coefficient of the variable indicates that the higher the concentration of the economic disadvantage students, the lower the student achievement (as measured by average TAKS scores). For every additional ten percent reduction in the percent economic disadvantage students, the average TAKS scores increased by 3.51 points, B = -.351.

Percent portable to total square feet per student. The second condition of facilities measure found to be significant during the multiple regression analysis was percent portable to total square feet per student. The sample multiple correlation coefficient for the percent portable to total square feet was .575. The resulting R Square Change of .045 indicates that approximately five percent of the variance in average TAKS scores can be accounted for by the percent portable to total square feet per student, $F(1,69) = 4.674$, $p < .05$. In addition to the variance explained by the variables of the percent of the percent of economic disadvantage students and average age of facilities, the negative regression coefficient of the variable indicates that the higher percent of portable square feet per student of the school facilities, the lower the student achievement (as measured by average TAKS scores). For every ten percent reduction in the percent of portable square feet per student of the school facilities, the average TAKS scores increased by 11.38 points, B = -1.138.

Average age of facilities. Three condition of facilities measures predicted average TAKS scores significantly over and above the percent of economic disadvantage students. The first of these facilities variables was average age of facilities. The sample multiple correlation coefficient for average age of facilities was .616. The resulting R Square Change of .049 indicates that approximately five percent of the variance in

average TAKS scores can be accounted for by the average age of facilities, $F(1,68) = 5.421$, $p < .05$. In addition to the variance of the average TAKS scores explained by the percent of economic disadvantage students, the positive regression coefficient of the variable indicates the older the school facilities, the higher the student achievement (as measured by average TAKS scores). The positive regression coefficient finding is counter-intuitive to what one might expect. Previous researchers have found that as school facilities get older, average TAKS scores decrease, not increase (Bowers & Burkett, 1988; Ikpa, 1992; O'Neill & Oates, 2001). This researcher believes the reason for a positive correlation between average age of facilities and average TAKS scores may be that many school districts in this study have renovated their very oldest facilities to bring them up to new standards, most likely because they can not afford a bond referendum to finance new construction.

When schools renovate old facilities, the old facilities essentially become new facilities after renovation. The descriptive statistics in this study point to precisely that explanation. In a majority of high schools in this study, older facilities went through a major renovation in recent years to bring them up to new standards. In fact, 64.38% of the high schools in this study renovated facilities within the past ten years.

There were 70 out of the 72 high schools that had renovated their school facilities within the past 40 years. As stated previously, schools begin to deteriorate significantly at about 40 years of age. There were only two high schools in this study that had not renovated their facilities in the last 40 years. The results for average age of facilities must be deemed inconclusive because the conflicting variable number of years since last renovation.

Percent deferred maintenance. The third condition of facilities measure that was found to be significant during the multiple regression analysis was the percent deferred maintenance. The sample multiple correlation coefficient for the percent deferred maintenance was .646. The resulting R Square Change of .038 indicates that approximately four percent of the variance in average TAKS scores can be accounted for by the percent deferred maintenance, $F(1,67) = 4.350$, $p < .05$. In addition to the variance of the average TAKS scores explained by the percent of economic disadvantage students, the negative regression coefficient of the variable indicates the lower the percentage of deferred maintenance of the school facilities, the higher the student achievement (as measured by average TAKS scores). For every additional 10 percent reduction in the deferred maintenance of the school facilities, the average TAKS scores increased by 0.61 points, $B = -0.61$.

Other predictor variables. The other predictor variables did not show a significant correlation with average TAKS scores in the multiple regression equation. The following predictor variables were excluded from the multiple regression equation for average TAKS scores: general condition of school facilities, percent (over) under capacity, number of years since last renovation, property value per student, and percent minority students.

Teacher Turnover

The second criterion variable examined in this study using multiple regression analysis was teacher turnover. average years experience of teachers with district was used as a proxy for teacher turnover. Teacher turnover is not reported at the school level by the Texas Education Agency (TEA). However, the average years experience of teachers with

district for each school is reported by TEA. Since there is only one high school in every school district in this study, average years experience of teachers with district can serve as a proxy for teacher turnover.

Tables 4.5, 4.6, and 4.7 reported the results of the multiple regression analysis for average years experience of teachers with district and each of the predictor variables mentioned previously for the responses from the 72 high schools selected. Multiple regression analysis showed that the linear combination of percent portable to total square feet per student measures and average age of facilities measures was significantly related to average years experience of teachers with district, $F(2,69) = 5.953$, $p < .01$. The total R Square Change of .147 for the sum of these predictors indicates that, taken together, the inclusion in the regression equation of both percent portable to total square feet per student and average age of facilities contributed approximately 15% of the variance in average years experience of teachers with district. Standardized and unstandardized multiple coefficients (Beta-values and *B*-values) of the final multiple regression equation were summarized in Table 4.7.

Table 4.5. Model Summary for Multiple Regression for Average Years Experience of Teachers with District

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.289(a)	.084	.071	1.71952	.084	6.398	1	70	.014
2	.384(b)	.147	.122	1.67091	.063	5.132	1	69	.027

a Predictors: (Constant), PORTABLE TO TOTAL SqFt
b Predictors: (Constant), PORTABLE TO TOTAL SqFt, AVG AGE OF FACILITIES

Table 4.6. ANOVA for Multiple Regression for Average Years Experience of Teachers with District

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.916	1	18.916	6.398	.014(a)
	Residual	206.971	70	2.957		
	Total	225.887	71			
2	Regression	33.243	2	16.621	5.953	.004(b)
	Residual	192.644	69	2.792		
	Total	225.887	71			

a Predictors: (Constant), PORTABLE TO TOTAL SqFt
b Predictors: (Constant), PORTABLE TO TOTAL SqFt, AVG AGE OF FACILITIES
c Dependent Variable: AVG YRS TEACHER EXPERIENCE

Table 4.7. Coefficients for Multiple Regression for Average Years Experience of Teachers with District

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	7.349	.224		32.809	.000	6.902	7.796			
	PORTABLE TO TOTAL SqFt	-.217	.086	-.289	-2.529	.014	-.387	-.046	-.289	-.289	-.289
2	(Constant)	6.581	.403		16.331	.000	5.777	7.385			
	PORTABLE TO TOTAL SqFt	-.232	.083	-.310	-2.775	.007	-.398	-.065	-.289	-.317	-.309
	AVG AGE OF FACILITIES	.023	.010	.253	2.265	.027	.003	.043	.228	.263	.252

a Dependent Variable: AVG YRS TEACHER EXPERIENCE

Percent portable to total square feet per student. The multiple regression analysis found that the first significant condition of facilities measure for the criterion variable average years teacher experience with district was percent portable to total square feet per student. The sample multiple correlation coefficient for percent portable to total square feet per student was .289. The resulting R Square Change of .084 indicates that approximately eight percent of the variance in average years experience of teachers with district can be accounted for by the percent portable to total square feet per student, $F(1,70) = 6.398$, $p < .05$. The negative regression coefficient of the variable indicates that the lower the percent of portable to total square feet per student, the higher the average years experience of teachers with district (lower teacher turnover). So the lower the percent of portable to total square feet per student in high school facilities, the lower the teacher turnover. For every additional ten percent reduction in percent of portable to total square feet per student, the average years teacher experience with district increased by 2.32 years, $B = -.232$.

Average age of facilities. The second significant condition of facilities measure was average age of facilities. The sample multiple correlation coefficient for the average age of facilities was .384. The resulting R Square Change of .063 indicates that approximately six percent of the variance in average years experience of teachers with district can be accounted for by the average age of facilities, $F(1,69) = 5.132$, $p < .05$. In addition to the variance in average years experience of teachers with district explained by the percent of portable to total square feet per student, the positive regression coefficient of the variable indicates the older the school facilities, the higher the years experience of teachers with district (teacher turnover decreases).

The positive regression coefficient finding is counter-intuitive to what one might expect. Previous researchers have found that as school facilities get older, teacher turnover increases, not decreases (O'Neill & Oates, 2001). This researcher believes the reason for a positive correlation between average age of facilities and average years experience of teachers with district is the same reason given previously for student achievement. Many school districts in this study have renovated their very oldest facilities to bring them up to new standards, most likely because they can not afford a bond referendum to finance new construction. When schools renovate old facilities, the old facilities essentially become new facilities after renovation. The descriptive statistics in this study point to precisely that explanation. In a majority of high schools in this study, older facilities went through a major renovation in recent years to bring them up to new standards. In fact, 64.38% of the high schools in this study renovated facilities within the past ten years.

There were 70 out of the 72 high schools that had renovated their school facilities within the past 40 years. As stated previously, schools begin to deteriorate significantly at about 40 years of age. There were only two high schools in this study that had not renovated their facilities in the last 40 years. The results for average age of facilities must be deemed inconclusive because the conflicting variable number of years since last renovation.

Other predictor variables. The other predictor variables did not show a significant correlation with average years experience of teachers with district in the multiple regression equation. The following predictor variables were excluded from the multiple regression equation for average years experience of teachers with district: general

condition of school facilities, percent (over) under capacity, number of years since last renovation, percent deferred maintenance, property value per student, percent economic disadvantage students, and percent minority students.

Student Attendance

The third criterion variable examined in this study using multiple regression analysis was average percent student attendance. None of the predictor variables showed a significant correlation with average percent student attendance in the multiple regression equation. All of the predictor variables were excluded from the multiple regression equation with average student attendance. Predictor variables excluded from the multiple regression equation included the following: general condition of school facilities, percent portable to total square feet per student, percent (over) under capacity, average age of facilities, number of years since last renovation, percent deferred maintenance, property value per student, percent economic disadvantage students, and percent minority students.

Chapter Summary

This chapter described the statistical analysis procedures used in this study, the results of the findings, and an analysis of those findings. Sections of this chapter included: (a) presentation of the data, including descriptive statistics for the study variables and (b) data analysis using multiple regression analyses. The interpretations from the statistical results of this study are discussed in Chapter Five.

CHAPTER V

SUMMARY, DISCUSSION, AND RECOMMENDATIONS FOR FUTURE RESEARCH

Introduction

This study examined the relationship between the condition of rural public high school facilities in Texas and certain educational outcomes. The condition of facilities variables selected for this study included: general condition of school facilities, percent portable to total square feet per student, percent (over) under capacity, average age of facilities, number of years since last renovation, and percent deferred maintenance.

The demographic variables selected for this study included: student wealth level (percent of economically disadvantaged students), school district wealth level (property value per student), and percent minority students. The educational outcome variables selected for this study included: student achievement, student attendance, and teacher turnover. The research question was: What is the relationship between the condition of school facilities and certain educational outcomes, particularly in rural Texas public high schools?

The condition of school facilities in Texas and across the United States is on the verge of becoming a national crisis. The General Accounting Office reported that almost 60% of schools in the United States had at least one major building feature that needed to be repaired, overhauled, or replaced. The students most likely to attend the most inadequate facilities were those who need academics the most—minorities and low-income students (General Accounting Office, 1995).

The condition of school facilities nationwide is one of deterioration and obsolescence. President Bill Clinton, in his 1997 State of the Union Address, stated, "We cannot expect our children to raise themselves up in schools that are literally falling down. With the student population at an all time high, and record numbers of school buildings falling into disrepair, this has now become a serious national concern" (Clinton, 1997).

Twenty percent of schools with high-income students were built before 1950. However, 33% of schools with low-income students were built before 1950 (National Center for Educational Statistics, 1999). Schools across the nation have postponed building new facilities or conducting major renovation projects due to the lack of capital projects funding. One survey estimated that deferred maintenance for rural schools has approached $2.6 billion, and the cost to replace rural school facilities was approximately $18 billion (Dewees and Earthman, 2000).

A study of the condition of facilities in rural schools in Texas was greatly needed. Texas has the "largest number of rural students attending the largest number of rural schools" in the nation (Stern, 1994, p. 15). Two-thirds of Texas' school districts enroll fewer than 1,500 students (Dawn & McLaughlin, 1999). Yet, there has been limited research on rural education. This lack of research may reflect the low priority given to rural education on a national policy level. Rural schools across the nation face critical facilities issues. The General Accounting Office (1996a) reported that 51% of rural schools have at least one inadequate building feature, such as roofs, foundations, walls, plumbing, HVAC, and electrical features (Dewees & Earthman, 2000).

When students attend school in facilities that are of lesser quality than other students, equity of educational opportunity comes into question. If students in poor school facilities

perform 5-17 percentage points lower than students in above-standard school facilities, the students in poor school facilities are disadvantaged when it comes to educational opportunity. If there is a relationship between the condition of school facilities and educational outcomes, educational leaders and policy makers must identify those building factors that contribute to these educational outcomes and make improvements in those spaces that will foster increased student learning.

Summary of the Study

This study analyzed a 2006 survey developed by the Texas Comptroller of Public Accounts. The Comptroller developed a comprehensive school facilities survey called *Current and Future Facilities Needs of Texas Public School Districts*. The Comptroller sent the survey to all 1,037 taxing and non-taxing school districts and charter schools in Texas regarding the condition of their school facilities. The survey was sent to school districts in response to a request by Texas Senator Eddie Lucio, Jr., to the State Comptroller's office on January 10, 2006.

There were 309 school districts that responded to the survey. This study examined school districts that were in the category of Rural and Non-Metro Stable school districts, as defined by the Texas Education Agency. These were primarily small rural school districts. This study focused on the 72 high schools in those rural school districts that had one high school that was a separate facility from their elementary and middle schools. This eliminated the very small high schools that have multi-grade facilities. Data from these high schools allowed the researcher to study only results from grades 9-12.

This report used only those facilities at the high school in which their Primary Use of Facility Category, as defined by the Comptroller's office, was Instruction. There were no

extra-curricular facilities, warehouses, storage facilities, central office administration, etc., used in this study unless they were a part of the high school building.

Multiple regression analyses using the forward method were conducted to determine the best predictor variables of the criterion variables from the condition of facilities variables and demographic variables selected from each high school. The predictor variables selected included condition of facilities variables of average age of facilities; number of years since last renovation; percent (over) under capacity; percent portable to total square feet per student; general condition of school facilities; and percent deferred maintenance. The other predictor variables selected were demographic variables. These demographic variables selected included student wealth level, as measured by the percent economic disadvantage students (percent of students who qualify for the free- and reduced-lunch program); school district wealth level, as measured by the property value per student (Comptroller's Property Tax Division (CPTD) property value per student); and percent minority students, as measured by the percent of non-white students. The criterion variables selected included student achievement, as measured by the average TAKS scores of 11^{th} grade all tests taken; teacher turnover, as measured by average years experience of teachers with district; and student attendance, as measured by the average percent student attendance.

Conclusions

It is sometimes difficult to generalize the findings in a study such as this to other school districts across the nation. This would be especially difficult if a study expanded its scope to include the population of all schools, urban and rural, large and small. That type of study might experience difficulty evaluating the significance of the impact of

school facilities on student outcomes due to the averaging of the variables and the complex nature of the factors that affect student outcomes. However, because this study surveyed all rural high schools taken from the entire population of public Rural and Non-Metro: Stable high schools in Texas, the findings can realistically be generalized to other small rural high schools across the United States.

Student Wealth Level

In the three multiple regression analyses conducted, the student wealth level (percent of economic disadvantage students) accounted for a significant percentage of the variance in only one of the cases, student achievement (average TAKS scores). The percent of economic disadvantage students did not enter the equation in the multiple regression analyses for the criterion variables teacher turnover (average years experience of teachers with district) and average percent student attendance.

It was not surprising that student wealth level (percentage of economic disadvantage students) accounted for approximately 29% of the variance in average TAKS scores. Low-wealth students consistently struggle to do as well on standardized tests as wealthy students. Student wealth level is frequently noted as one of the main contributors to the variance in standardized test scores (Earthman, 2002, Lanham, 1999, & Lyons, 2001).

This study confirmed previous research that highlighted the importance of providing additional resources to students from impoverished homes. If states are going to continue to use standardized tests to hold students and schools accountable for educational success, then policy makers must provide additional resources to schools with high percentages of low-wealth students. These additional resources can be used to help close the student achievement gap between low-wealth and high-wealth students. If states do

not provide these additional resources to schools with high percentages of low-wealth students, our nation's schools will continue to be segregated by schools with students of privilege and schools with economic disadvantage students.

The student wealth level (percent economic disadvantage students) did not seem to have much of an effect on teacher turnover (average years experience of teachers with district) and percent student attendance. The student wealth level (percent economic disadvantage students) did not enter the equation for teacher turnover or percent student attendance. As measured by these tests, teacher turnover and student attendance appeared to be less effected by socioeconomic factors than student achievement. This should be encouraging to policy makers and school leaders, because they very little control over the socioeconomic status of the children who come to school. They do, however, have control over the resources necessary to provide quality school facilities that provide the environment for a quality education for every child in Texas.

Portable Classrooms

The percent portable to total square feet per student accounted for a significant percentage of variance in two of the multiple regression analysis cases, student achievement and teacher turnover. The percent portable to total square feet per student did not enter the equation in the multiple regression analysis for the criterion variable average percent student attendance. The percent portable to total square feet per student accounted for approximately five percent of the variance in student achievement (average TAKS scores) and eight percent of the variance in teacher turnover (average years experience of teachers with district).

Portable classrooms do not always provide the best conditions for quality learning. There is generally less electrical capacity, less safety and security, and less square feet in a portable classroom than in a permanent classroom. When classrooms are too small, the teacher has less room to implement modern teaching strategies, such as differentiated learning centers, computer centers, and individual peer tutoring groups. This study finds that the percentage of portable instructional square feet per student to total instructional square feet per student can predict as much as five percent of the variance of student achievement (average TAKS scores for students).

This study revealed that the largest percentages of portable classrooms were found at high schools that had the largest percentage of poor and minority students. The very students who need the most help to overcome educational disadvantages are being deprived of equal educational opportunity by having the largest percentage of portable classrooms in the state. Policy makers and school leaders must establish priorities to reduce the number of portables in the school districts so that students will not be at a disadvantage to other students learning in permanent classrooms.

This study also found that the percentage of portable instructional classrooms can predict as much as eight percent of the variance in teacher turnover (the number of years of experience of teachers with a district). Therefore, schools with a large percentage of portable classroom square feet are likely to have a larger teacher turnover rate than schools with permanent classroom space. Generally, when experienced teachers leave schools with low-income students, they are often replaced by novice teachers. Researchers generally agree that novice teachers produce smaller learning gains in students than do more experienced teachers (Hanushek & Rivkin, 2007).

A large teacher turnover rate costs the school district time, energy, and money to recruit and train new teachers. If a school district does not have the money to build quality, permanent facilities for its students, it would be difficult to provide the increased money necessary to fund the additional recruiting and training of new teachers that comes from high teacher turnover.

Policy makers and educational leaders must provide adequate resources to schools for the purpose of capital improvements. These resources are desperately needed to not only provide quality facilities for its students, but also to reduce the costs of high teacher turnover. The current school facilities financing structure does not provide the resources to help all schools build enough permanent classroom space so they can eliminate the need for portable classrooms. The current school facilities financing program has provided some relief for construction of facilities for the very poor school districts, and the very wealthy school districts can fund new construction out of savings from recapture when they pass a bond referendum. But the legislature has not addressed the need of most school districts in the state that are neither very wealthy nor very poor districts. The state needs a permanently funded school facilities finance program that can serve the needs of all children in the state.

Age of Facilities

The average age of facilities accounted for a significant percentage of the variance in two of the multiple regression analysis cases, student achievement and teacher turnover. The age of facilities did not enter the equation in the multiple regression analysis for the criterion variable percent student attendance. The average age of facilities accounted for approximately five percent of the variance in student achievement (average TAKS

scores) and three percent of the variance in teacher turnover (average years teacher experience with district). However, the results found a positive regression coefficient for average TAKS scores and average years teacher experience with district. This finding contradicts previous research (Bowers & Burkett, 1988; Ikpa, 1992; O'Neill & Oates, 2001).

This researcher believes the reason for the positive regression coefficient for average TAKS scores and average years experience of teachers with district is because many school districts in this study have renovated their very oldest facilities to bring them up to new standards. When schools renovate old facilities, the old facilities essentially become new facilities after renovation. In fact, 64.38% of the high schools in this study renovated facilities within the past ten years. There were only two high schools in this study that had not renovated their facilities in the last 40 years. The results for average age of facilities must be deemed inconclusive because of the conflicting variable, number of years since last renovation.

Deferred Maintenance

Deferred maintenance refers to the amount of maintenance in a school that was needed but was deferred because of a lack of resources to perform the maintenance. The percent deferred maintenance accounted for a significant percentage of the variance in one of the multiple regression analysis cases, student achievement. The percent deferred maintenance did not enter the equations in the multiple regression analyses for the criterion variables teacher turnover or average percent student attendance. The percent deferred maintenance accounted for approximately four percent of the variance in student achievement (average TAKS scores).

The percent of deferred maintenance in school facilities can have an affect on the educational process of a school. Deferring any type of maintenance can lead to larger problems than the original maintenance that was required. This can have devastating effects on systems such as air conditioning and heating, roofing, plumbing, and electrical systems. If these maintenance needs are allowed to grow to serious problems, a school could be without plumbing, without heating and cooling, and without lights. The educational process could grind to a halt with any one of these maintenance dilemmas. Teaching and learning would be very difficult in situations where deferred maintenance were allowed to go on to an extreme (Cash, 1993).

Lanham (1999) found that classroom lighting and comfortable temperature are critical basic components of a quality education. Schools that allow a large percentage of deferred maintenance problems to exist run the risk of destroying the educational opportunity for students in that environment. This study found that the more deferred maintenance problems in a high school, the less success the students demonstrate through their average TAKS scores. Policy makers and educational leaders must provide the resources and leadership to adequately maintain school facilities so that all children can have access to a quality education.

Other Predictor Variables

Three condition of facilities variables, general condition of school facilities, percent (over) under capacity, and number of years since last renovation, did not account for a significant percentage of the variance in any of the three criterion variables. Further research is needed to substantiate the findings in these two areas.

This study found the other demographic predictor variables, school district property wealth and percent minority students, did not account for a statistically significant percentage of the variance in any of the three criterion variables. This finding warrants further study in other contextual situations, such as large, urban schools, to determine if this finding is true for all categories of schools.

Implications for Practice

There are several implications for best practices that come from this study. The findings in this study revealed that socioeconomic backgrounds of students in rural high schools have the most influence on the variability of educational outcomes. However, certain conditions of school facilities can have a measurable affect on the educational outcomes of student achievement and teacher turnover, particularly when combined with the socioeconomic characteristics of students. The fact that students come to school with differing socioeconomic backgrounds that are out of the control of educators magnifies the importance of policy makers and educational leaders to establish priorities and policies in the areas they do control that will improve educational opportunities for all children. The condition of school facilities may have a small affect on educational outcomes when compared to the affect of socioeconomic factors, but it is one of the few variables over which school leaders have some control.

An effective teacher retention strategy is for schools to improve and upgrade their school facilities. Teacher turnover is not only very costly for school districts, but it negatively affects student achievement (Schneider, 2003). Working conditions, including facilities, safety, and quality of leadership have more affect on teacher mobility than teacher salary (Hanushek & Rivkin, 2007).

Buckley et al. (2004) found that the impact of facility improvement on teacher retention is equal to or greater than the impact of pay increases for teachers. Studies of teacher satisfaction in developing nations also show that improvement in the quality of facilities was found to offset low wages. One benefit of the strategy of improving school facilities is that it is actually a more cost-effective teacher retention strategy than a permanent salary increase for teachers. Salary increases are on-going year after year. Facilities improvements are likely to be a one-time expense, last for many years, and have supplemental sources of state or federal funding available.

If policy makers and school leaders continue the failed policies of not providing the resources necessary to upgrade inadequate school facilities, Texas will see the educational gap widen between the schools with quality facilities and those with dilapidated facilities. Martin Luther King, Jr., once said, "Injustice anywhere is a threat to justice everywhere" (Carson, 2001). An appropriate paraphrase of this quote would be, "Inequity anywhere is a threat to equity everywhere." The theme of equity addresses the issue of justice and fairness for all children in Texas. The quality of the school facilities in which a child receives his or her education should not depend on the wealth of the area in which he or she happens to reside. Excellent facilities for the few and adequate or barely adequate facilities for the many violates the proud heritage of Texas.

Equal educational opportunity is fast becoming the new civil rights issue of the 21st century. Excellent facilities for children who need them the least and inadequate facilities for the ones who need them the most violates the principal of equal educational opportunity for all. Policy makers and educational leaders have a responsibility for providing a quality education system for all children.

John Dewey once said, "What the best and wisest parent wants for his own child, that must the community want for all its children" (Dewey, 1900, p. 3). Dewey's ideal can be applied to equity in educational facilities by paraphrasing his words: What the most affluent community wants in the way of school facilities for its best and brightest students, that must the state of Texas want for all children in the state.

Public education for all children is necessary for a free, democratic society. Equal educational opportunity must be provided for all children to level the playing field for everyone. America must have a public school system that provides an informed citizenry needed for democratic government, embraces the welfare of all children in the nation, upholds the ideal of equal educational opportunity, and levels the playing field for all children. Social justice and equal educational opportunity demand that the quality of school facilities should not be determined by race or social class.

Inequitable school funding has resulted in an economic segregation of students that closely resembles the racial segregation of the early 20th century. In 1954, the United States Supreme Court ruled that separate but equal facilities were no longer sufficient, partly because the school facilities of black schools were actually not equal to the school facilities of white schools (*Brown v. Board of Education*, 1954). Today, when school facilities are found to be unequal, equal educational opportunity still does not exist for all children. Texans must insist that policymakers not allow inadequate and unequal funding for those school facilities that serve low-income and minority children. Otherwise, many children will still face the reality of separate but unequal school facilities.

Rural public schools in Texas may be moving toward a two-tiered school system: one for more affluent, mostly white students who enjoy the advantages of quality school

facilities, and the other, for low-income, mostly non-white students who attend schools with facilities that limits their opportunity to learn at a comparable level. It has always been immoral to shortchange schools that educate the greatest numbers of students growing up in poverty. As long as students continue to be disadvantaged by being educated in substandard facilities, advocates for children everywhere must continue to call for equity in our public educational system.

Recommendations for Further Research

Several topics have emerged from this study that should be considered for future research. This study should be replicated utilizing data from elementary schools or middle schools in rural school districts in Texas.

This study should be replicated utilizing different district types to investigate the relationship between the condition of school facilities and educational outcomes in different types of school districts, such as major urban school districts.

This study should be replicated utilizing private schools and charter schools to see if the condition of school facilities has an affect on educational outcomes in those settings. This researcher knows of no study being done on the condition of facilities at these types of schools. With the growing number of private and charter schools across the nation, it would be very informative for policy makers and educational leaders to have quality data about the condition of facilities and educational outcomes of these schools.

This study should be replicated on a national level. The survey instrument could be adapted and revised to be useful in determining if similar relationships exist between these variables on a national level. With the current national debate on the condition of school facilities, this study would be very timely in providing information for the debate

on the role of the federal government in replacing the aging school infrastructure across the country.

This study should be adapted to gather information about the relationship between the condition of school technology infrastructure and educational outcomes. With the investment of local, state, and federal dollars made in technology, this relationship is an important research topic for schools all across the nation.

This study should be adapted and used in a situation in which a school is tearing down a high school and rebuilding the school in the same location. This situation would help control for many factors for which it is usually difficult to control. This context would allow the information to be gathered over time from the same community, similar students, similar faculty, and similar teaching strategies.

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APPENDIX A

SURVEY INSTRUMENT USED IN STUDY AND ACCOMPANING INSTRUCTIONS

CURRENT AND FUTURE FACILITIES NEEDS OF TEXAS PUBLIC SCHOOL DISTRICTS
http://www.window.state.tx.us/survey/facilities/

Texas Comptroller Carole Keeton Strayhorn is conducting a survey of current and future facility needs in Texas public schools, at the request of Senator Eddie Lucio, to assist the Legislature in its planning efforts in advance of the 80th Regular Legislative Session. ***Although the information requested is very valuable to the state, please understand that your participation in this survey is completely voluntary.***

This survey may require considerable time to research and complete, and individuals with responsibility for enrollment projections, budgeting, energy management as well as facilities may need to have input, therefore we recommend that you download the survey from http://www.window.state.tx.us/survey/facilities/, and print a copy of the survey to use in compiling the information in advance of entering your responses on-line. You will be asked to submit your facility inventory in an Excel spreadsheet format. The template is available on-line at: http://www.window.state.tx.us/survey/facilities/survey.xls. No names are required on the survey, but your name and contact information would be helpful should questions regarding your responses arise.

Please select the answer that best describes your response to the survey question. For ratings questions, please mark the appropriate box.

1. School District Name: (Please give the name only, omitting reference to Independent, Consolidated or Municipal School District at the end. For example, the Houston Independent School District would simply express the name as "Houston".)

2. School District Number:

			–			

3. I am completing this survey in my capacity as: (Check the one that most closely applies):

Superintendent	❑
Assistant Superintendent with responsibility for facilities	❑
Director/Manager/Supervisor with responsibility for facilities	❑
Other (Please describe)	❑

_____

4. Please download and complete the following inventory of all district facilities using the Excel template, which is available at http://www.window.state.tx.us/survey/facilities/survey.xls. See the example below. Please submit the information via email to: facility.survey@cpa.state.tx.us.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Fac Name	**Primary Use (I, A, S, W, E, R, N, D, O)**	**Student Enrollment Fall 2005 Snapshot**	**Type of Campus (N, E, I, H, M)**	**YEAR BUILT**	**Year Last Renovated**	**Student Capacity of Perm Facility**	**Permanent Building Square Footage**	**Number of Portables**	**Square Footage of Portables**	**Permanent Building Condition (E, G, F, P, N)**	**Dollar Amt of Current Maint Needs**	**Dollar Amount of #12 Needs Budgeted for FY 2006**	**Year Major Renovations Are Anticipated**	**Year Building Should Be Replaced**
	I	**432**	**E**	**1975**	**1998**	**450**	**11,000**	**6**	**4,000**	**F**	**$25,000**	**$17,500**	**2008**	**2025**

FACILITY INVENTORY INSTRUCTIONS

General Instructions: When completing this spreadsheet, it is important to separate instructional facilities from all others, since much of the analysis that will be performed on this data will be done *on a per-pupil basis*. **Please do not leave any fields blank; rather, indicate zeros, N/A (not applicable), or 9999 for columns requesting a year that is unknown.**

For purposes of this survey, information about any single building is not as important as the total capacity and condition of a campus or site, which may be made up of multiple buildings. Therefore, we ask that when there are multiple buildings that make up a single campus or site, please summarize all information for all buildings within a primary use category (Column #2) on one line. For example, if nine of the ten buildings that make up a given high school campus are used for instructional purposes (Column #2: I=Instruction), all of the square footage, student enrollment, capacity estimates, etc. for those nine buildings should be summarized on one line. The remaining building that, for illustrative purposes serves as a bus barn, would be entered on a separate line (Column #2: S=Support Services). A campus may also house multiple programs with separate campus identification numbers, such as a Pregnant Teen Program, an Alternative Education program and the like. If the programs co-exist in one facility, then information for the facility would be entered only once under the name of the campus, showing the unduplicated student enrollment in all programs.

NOTE: Some of the information requested in this spreadsheet may be available through your insurance company, in the company's annual facility assessment of values or insurable properties document, and/or some may be captured for financial reporting purposes as a result of GASB 34 requirements.

1) Facility/Campus Name – Provide the name your district uses when referring to this facility, campus or cluster of buildings. If this is a leased facility, and ownership of the property does not automatically revert to the district at the end of the lease agreement, add the word LEASED after the name of the facility. (i.e., Sanchez Elementary LEASED).
2) Primary Use – ***Only designate one "primary use" for each facility***. When a facility is used for multiple purposes, the "primary use" is the purpose for which the majority of the facility space is used for more than 50% of the time. Select ***one, most appropriate*** answer from the following: I = Instruction (gymnasiums, cafeterias and libraries associated with a specified campus are considered to be part of an instructional facility); A = Administrative; S= Support Services (i.e., bus barns, print shops, etc.); W = Warehouse and Storage; E = Extracurricular or Sports (use only if classes are not held in this facility during more than 50 percent of the day); R = Residence for Staff; N = Not in Current Use; D = Abandoned and may be candidate for demolition; O = Other.
3) Student Enrollment Fall 2005 Snapshot – For non-instructional facilities, enter "N/A". If the response to #2 Primary Use was "I" indicate total enrollment on this campus as it was reported to TEA for the Fall 2005 SNAPSHOT submission. If multiple programs or campuses co-exist in a facility, please indicate the total enrollment for all programs or campuses at this facility.
4) Type of Campus – For non-instructional facilities, enter "N" for not applicable. If the response to #2 Primary Use was "I", select the most appropriate answer based on the grade levels served on this campus. If the grade levels served fall into two categories, select the grade category that best describes the majority of students on that campus. For example, if a campus serves students in grade 3 through 6, and 6th graders represent only 25% of the student body on that campus, you would select "E" because the majority of students served fall into that category. However, if the campus serves students from Pre-K through grade 8, the most appropriate answer would be "M". The categories are defined as follows: E=Elementary (Early Childhood through grade 5); I=Intermediate (grades 6 through 8); H=High School (grades 9 through 12); and M=Mixed/multi-grade (groupings that encompass multiple categories, such as K-8 or K-12).
5) Year Built – Provide the date when the main facility was first constructed. When multiple buildings exist on the same campus, enter the date when the oldest building was constructed. ***If the year built is unknown, enter 9999.***
6) Year Last Renovated – Renovations do not include general maintenance and repairs, but rather would include space additions, space modifications or other structural enhancements that are needed to expand capacity or improve the efficiency or functionality of the facility. In the case of campuses with multiple buildings, please provide the date when the last renovations on this campus occurred. *If the campus has never been renovated, please enter the year built for the date of last renovation.* ***If the year of last renovation is unknown, enter 9999.***

7) Student Capacity of Permanent Facility – ***If this is a non-instructional facility, enter N/A.*** For instructional facilities, please provide the total current student capacity for all habitable permanent facilities on this campus or at this location. DO NOT INCLUDE THE CAPACITY OF PORTABLES, TEMPORARY OR NON-PERMANENT MODULAR FACILITIES IN THIS NUMBER (See questions #9 and #10 below). Provide your best estimate of the total number of students this facility could house, without creating overcrowded, unsafe or unsanitary conditions. Remember to account for the state-mandated 22 to 1 class sizes when calculating the student capacity of kindergarten through 4th grade classrooms. Also, specialized classrooms such as science labs, art rooms, music rooms, special education classrooms, vocational rooms, computer labs, etc., should be included when calculating the student capacity of middle school and high school facilities, but the specialized classrooms should not be included when calculating the student capacity of elementary school facilities. For purposes of consistency from district to district when calculating student capacity, use the space and minimum square foot requirements found in the Texas Education Agency's School Facilities Standards, §61.1036 TAC (the Standards can be downloaded from: http://www.tea.state.tx.us/school.finance/facilities/standards.pdf).
8) Permanent Building Square Footage – As described in #7 above, please provide the total square footage for all habitable permanent facilities on this campus or at this location. DO NOT INCLUDE THE SQUARE FOOTAGE OF PORTABLES, TEMPORARY OR NON-PERMANENT MODULAR FACILITIES IN THIS NUMBER (See #10 below).
9) Number of Portables – please provide the number of portable, temporary or non-permanent modular buildings used at this site, which are specifically designed and constructed to be moved from one location to another as necessary. If there are one or more modular buildings used at this site which were constructed to serve as permanent facilities, please include the capacity and square footage of these modular buildings in #7 and #8 above. If there are no portables on this site, please enter zero rather than leaving the field blank.
10) Square Footage of Portables – Calculate the total habitable square footage of all habitable portable, temporary or non-permanent modular buildings identified in #9 for this campus or at this location.
11) Permanent Building Condition – The information requested here is the condition of the facility, as it exists today. When assigning a condition to the permanent facility, the following descriptors should be used: E = Excellent, no major repairs are needed; G = Good, some repairs may be beneficial but the facility is structurally and educationally sound; F = Fair, major repairs are needed, but the building's condition does not impair student learning or staff/student safety; P = Poor, the condition of the facility impairs student learning and staff/student safety; N = Needs Replacement, needed repairs are extensive and the cost to make the facility safe and structurally and educationally sound exceeds the cost of replacement.

12) Dollar Amount of Current Maintenance Needs – When determining outstanding maintenance needs, maintenance is defined as scheduled, periodic work on facilities to keep them in good working order by preventing their deterioration. This should include both current planned and deferred maintenance, such as the repair or replacement of major infrastructure systems like roofs, air conditioners and the like. The dollar amount of maintenance needs should also include maintenance that is scheduled and budgeted for during the summer months, but has not yet been started.
13) Dollar Amount of #12 Needs Budgeted for FY 2006 – Of the amount of maintenance needs identified in #12 above, indicate the dollar amount that is already budgeted, and expected to be completed this fiscal year. Do not include the dollar amount of contingency budgets for unexpected or emergency repairs or renovations, if dollars have not been specifically designated for the needs identified in #12 above.
14) Year Major Renovations Are Anticipated – When in the future do you feel that major renovations will be needed to insure that this facility meets enrollment/capacity needs and/or remains useable and safe. Major renovations are defined as space additions, space modifications or other structural enhancements that are needed to expand capacity or improve the efficiency or functionality of the facility. If major renovation is scheduled in the coming year, please enter 2006 for the anticipated date. ***If the year when major renovation cannot be anticipated, enter 9999.***
15) Year Building Should Be Replaced – Enter the year when you believe that the facility will have reached its useful life and require replacement. If you do not think that this facility will be replaced, because of, for example, its historic significance, please enter "N/A". If the facility is leased, and ownership of the property does not automatically revert to the district at the end of the lease agreement, enter the letter L and the year that the lease expires. (i.e., for a lease expiring in 2010, enter L2010). ***If the year when the building should be replaced cannot be anticipated, enter 9999.***

Enrollment Projections

5) Based on the information you have available to you at this time, what do you project your student enrollment will be in the coming years? (Numbers only, do not use commas or periods)

(Five years from now) 2011	**(Ten years from now) 2016**	**(15 years from now) 2021**	**(20 years from now) 2026**

ENERGY EFFICIENCY

6) My district controls energy costs and conserves natural resources by (a response is required for each option):

	Yes	**No**
Implementing an active energy management program.	❑	❑
Employing or designating an energy manager whose primary responsibility is controlling energy costs.	❑	❑
Making energy retrofits of lighting, air conditioning or other high consumption equipment in the last five years.	❑	❑
Conducting a preliminary energy assessment of its facilities.	❑	❑
Participating in the Watt Watcher Program, or a similar program designed to heighten student and staff energy conservation awareness.	❑	❑
Adopting board-level energy policies and procedures.	❑	❑
Using renewable energy sources.	❑	❑
Using performance contracts to finance retrofits.	❑	❑
Requiring energy efficiency into new facility designs.	❑	❑

7) My district controls energy costs and conserves natural resources by (Check the appropriate reply for each possibility listed):

	Yes	No	Not Available in this Area of the State
Competitively procuring electricity, water or gas.	❑	❑	❑
Cooperatively procuring electricity, water or gas.	❑	❑	❑
Recycling in campus lunchrooms	❑	❑	❑
Recycling district-wide.	❑	❑	❑
Taking advantage of federal and state energy discounts.	❑	❑	❑

OPTIONAL

Name (First and Last):

Phone:

Email:

Thank you for taking the time to complete this survey.

Should you need assistance, please feel free to contact the Local Government Assistance Division by phone at 1-800-531-5441, extension 3-4679 or via email at: facility.survey@cpa.state.tx.us.

APPENDIX B

LETTER FROM SENATOR EDDIE LUCIO, JR.

The Senate of The State of Texas

Senator Eddie Lucio, Jr.

January 10, 2006

The Honorable Carole Keeton Strayhorn
Texas Comptroller of Public Accounts
Post Office Box 13528, Capitol Station
Austin, Texas 78711-3528

Carole

Dear Comptroller Strayhorn,

During the 79th Regular Session your staff provided helpful research and guidance for SB 939, a statewide study of public school facilities. I was able to amend the facility study to HB 2 late in the session, and the language was maintained in subsequent versions of the public school finance bill. As you know, none of the school finance bills passed and therefore, I respectfully request that you consider undertaking this very important study of instructional facilities in Texas.

A study such as this would assess the current inventory of school facilities in Texas, examine the most pressing needs and estimate the projected costs associated with meeting construction needs in the next 10 to 20 years.

With the student population in Texas growing at a fast rate, certain school districts are struggling to keep up with the need to add classrooms and build new schools. For example, Brownsville ISD has more than 400 portable buildings serving as classrooms. There is no statewide data that identifies the total number of portable classrooms in use by school districts in Texas or the projected need for new instructional facilities.

The legislature cannot properly address the shortcomings in public instructional facilities without the necessary information that a study would provide. A study would help legislators and school districts better plan for the future, especially in regard to state assistance programs such as the Existing Debt Allotment and Instructional Facilities Allotment.

Furthermore, the 2004 District Court decision on public school finance states that public school facilities for property-poor school districts are inadequate and inequitable compared to others in the state. While the Texas Supreme Court did not uphold the District Court's decision related to facilities, it implied it was on the basis of lack of information. A study of instructional facilities would be a first step toward determining if inequity exists and addressing the issue.

Committee Memberships: Chairman, International Relations and Trade ★ Business and Commerce ★ Jurisprudence ★ Natural Resources ★ Subcommittee on Agriculture ★ Sunset Advisory Commission
P.O. Box 12068 ★ Austin, Texas 78711 ★ 512/463-0127 ★ Fax: 512/463-0061 ★ Dial 711 for Relay Calls
500 S. Kansas ★ Weslaco, Texas 78596 ★ 956/968-9927 ★ Fax: 956/447-0583
7 North Park Plaza ★ Brownsville, Texas 78521 ★ 956/548-0227 ★ Fax: 956/548-0440

I have enclosed the revised facilities study language that was included in the last few versions of the school finance bill. Feel free to contact me or my education analyst, Perla Cavazos, if you have any questions regarding this study. As always, your attention to this matter is greatly appreciated, as is your commitment to the school children of Texas.

Respectfully yours,

Eddie Lucio, Jr.
Texas State Senator

Enclosure

ELJ/pcc

Thank You for ALL that you do for the people of Texas!

2

** TOTAL PAGE.03 **

Amend **CSHB 2** in Part C, Article 1, of the bill (committee printing, page 16, between lines 19 and 20), by inserting the following new section, appropriately numbered, and renumbering the subsequent sections of Part C, Article 1, accordingly:

SECTION 1C.__. Subchapter A, Chapter 46, Education Code, is amended by adding Section 46.014 to read as follows:

Sec. 46.014. STUDY REGARDING INSTRUCTIONAL FACILITIES. (a) The comptroller in cooperation with the agency shall study:

(1) existing instructional facilities in this state; and

(2) the projected need for instructional facilities in the next 10 to 20 years.

(b) The study of instructional facilities must include an examination of the following objectives and any other objectives determined appropriate by the comptroller and the agency:

(1) a determination as to which of the following needs of school districts in this state relating to instructional facilities are the most pressing:

(A) the need for new instructional facilities;

(B) the need for repairs to existing instructional facilities;

(C) the need for renovations of existing instructional facilities; and

(D) other needs relating to instructional facilities;

(2) an estimate of the total cost of necessary construction, repair, or renovation of instructional facilities in the next 10 to 20 years;

(3) a determination of the number of school districts and campuses that have student populations that exceed the maximum capacity of the districts' or campuses' classrooms, cafeterias, or gymnasiums, including if appropriate a determination of:

(A) the number of portable buildings in use by each school district and campus;

(B) the square footage of instructional facility space per student; and

(C) the number of instructional facilities that

are serving a number of students that exceeds the maximum capacity of the facility; and

(4) a determination of the extent to which instructional facilities in this state are energy and water use efficient.

(c) In projecting the need for instructional facilities in the next 10 to 20 years, the study must determine the facilities that will need to be constructed, repaired, or renovated in this state. The study may include:

(1) projections as to the date new instructional facilities will be needed or the date existing instructional facilities will need to be repaired or renovated;

(2) information relating to the date of construction or age of existing instructional facilities; and

(3) information relating to the dates of the most recent major renovations of existing instructional facilities.

(d) The comptroller and the agency shall determine the appropriate methodology for use in conducting the study required by this section.

(e) Not later than December 1, 2006, the comptroller and the agency shall submit to the legislature a report based on the study required by this section. This section expires January 15, 2007.

APPENDIX C

FACILITY SURVEY LETTER

May 1, 2006

[Title] [First Name] [Last Name]
Superintendent
[District Name]
[District Address]
[City, State, Zip}

Dear Superintendent [Last Name]

As the state's chief financial officer, with responsibility for all the state's fiscal concerns, my office is conducting a survey of current and future facility needs in Texas public schools, at the request of Senator Eddie Lucio. I believe that the information I am requesting on or before June 30, 2006, could be very valuable to the state, but please understand that your participation in this survey is completely voluntary.

With school finance once again brought to the forefront by the recent Texas Supreme Court ruling, facilities and facility funding are issues of growing concern. You and I both know that there are older schools needing major repairs and renovations, and in growing districts there is a constant need for new and expanded schools. Portables are becoming a way of life in many districts, yet we all know that these kinds of buildings are not as safe, they are not as conducive to learning, and they cost a great deal more to heat and cool. They just aren't good for kids.

To compound the problem we have no good data on how many facilities are owned or operated by Texas school districts. We don't know the condition of those facilities. We don't know the extent of overcrowding. And, we don't know how all of this is affecting our children.

That is why I have accepted Senator Eddie Lucio's request that I conduct a statewide facility study—the results of which should be out before the start of the 80th Legislative Session, January 2007. I believe the Legislature and state leaders need to understand the magnitude of the problem before we can fix the problem.

The survey will remain available through June 30, 2006 on my *Window on State Government* Web site at http://www.window.state.tx.us/survey/facilities/. But, please understand that this survey may require considerable time to research and complete, and individuals with responsibility for enrollment projections, budgeting, energy management as well as facilities may need to be brought together to complete the survey; therefore, I highly recommend that you download and print a copy of the survey to use in compiling the information in advance of entering your responses online. You will also be asked to submit your facility inventory in an Excel spreadsheet format. The template is available online at http://www.window.state.tx.us/survey/facilities/survey.xls. No names are required on the survey, but your name and contact information would be helpful should my staff need to contact you to clarify your responses.

If you have questions or concerns, or if you need assistance in completing this survey, please contact my Local Government Assistance Division staff by e-mail at facility.survey@cpa.state.tx.us or you may call them directly at 1-800-531-5441, extension 3-4679.

I appreciate your willingness to participate in this important project. Please know that I welcome your good advice at any time. Thanks for all that you are doing for future generations of Texans.

Sincerely,

Carole Keeton Strayhorn
Texas Comptroller

APPENDIX D

IRB REVIEW

Dear Researchers:

I am preparing your human subjects research proposal for the IRB Reviewer entitled, "The Relationship Between the Condition of Public Schools Facilities and Student Outcomes."

The proposal submitted will not require IRB review or approval since you will not be interacting with human subjects or conduct any intervention with human subjects. The data you describe is secondary data involving numbers and not human subjects.

If you have any further questions, please do not hesitate to contact me.

Sincerely,
Donna Peters

Donna Peters, CIP
IRB Coordinator
Office of Research Services
Texas Tech University
Phone: 806.742.3884 x227
Fax: 806.742.3892
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