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A STUDY OF THE EFFECT SCHOOL FACILITY CONDITIONS HAVE ON STUDENT ACHIEVEMENT

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A STUDY OF THE EFFECT SCHOOL FACILITY CONDITIONS HAVE ON STUDENT ACHIEVEMENT

by

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DEDICATION

to James, forever

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The purpose of this study was to explore the effect school facilities have on student achievement as measured by the Texas Assessment of Academic Skills, TAAS, test in a high-performing, high-poverty school district in Texas. A relationship between the condition of school facilities and student achievement, while assumed, is difficult to assess. This study contains a presentation of the information and data findings from the Ysleta Independent School District and its decision in 1994 to include school facilities as a component of its student achievement initiative. The schools were randomly selected and the case study

research was conducted using a mixed-method approach. Data provided by the schools' principals on building structure, maintenance, and housekeeping were collected using a questionnaire based in part on the "Commonwealth Assessment of Physical Environment" used by Cash (1993), Hines (1996) and Lanham (1999) in Virginia. Student achievement was measured using the percent of students at each school passing the TAAS sub-tests of reading, mathematics, and writing and the percent passing all the TAAS tests from 1994 to 2001. The effect school facility conditions have on student achievement found definition through the major themes of risky decisions, powerful people, buildings matter and accountability.

The study resulted in findings that merit attention and support previous research that points to building age, overall building maintenance and cleanliness as elements that help explain student achievement. These findings were limited due to the self-reported nature of information collected using surveys, the small sample size of schools, and the aggregate nature of the data that can obscure or neglect important evidence. Nevertheless, since the goal of the Texas education system is to improve student achievement, the identification of barriers to achievement brought on by the condition of school facilities is important.

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CHAPTER I

THE STUDY

Introduction

Before some Texas principals can recruit and retain qualified teachers, implement programs designed for academic excellence and nurture a student body that cares about themselves and their community, they must grapple with the problems created by overcrowded, poorly maintained, and pitifully outdated school facilities (Earthman, 1996). Texas is not alone. More than one third of the nation's public schools need major repairs. The National Education Association (NEA) estimates these repairs will cost taxpayers over $322 billion. The National Center for Education Statistics projects elementary and secondary enrollments will swell to 54.4 million by 2006. To serve additional students, state and local governments will need to build approximately 6,000 new schools in the next decade. The average price for a new school will be near $10 million ("Efforts to fix," 1996). In 1995 over half of the schools reporting to the United States General Accounting Office (GAO) listed at least one major building feature in disrepair requiring extensive repair or replacement (Health, Education, and Human Services Division, February, 1995). As a result, debate and litigation concerning access to

one of the few quantifiable elements of quality education continues to be heard in state legislatures and courthouses across the country.

As Hanson (1992) pointed out, 31 percent of American schools were built prior to World War II. As a result of increasing demands on public funds, facility improvement and maintenance are often deferred. Deferred maintenance has emerged as a trouble spot because of school districts' need to divert funds earmarked for maintenance to other educational reform measures (Lanham, 1999). Poor districts are caught in a trap of needing funds, yet not having the tax base to support higher costs. Decision-makers are faced with the difficult decision to cut existing programs and services or defer routine maintenance. Unfortunately, maintenance is often the target since the effects are not immediately visible. According to the GAO, one-third of all schools serving 14 million students need extensive repair or replacement; 28,100 schools serving 15 million students have less-than-adequate heating, ventilation, and air-conditioning systems; 23,100 schools serving 12 million students have less-than-adequate plumbing; and 21,000 schools serving 11 million students have less-than-adequate roofs. It is easy to see why many educators and public officials believe that the next crisis in education will involve facilities.

Equity, efficiency, and accountability have emerged as central themes for educators and lawmakers across the country. In his 2001 State of the Union address, President George W. Bush called for continued emphasis on equity,

accountability and a resolution to the problems of our nation's crumbling school infrastructure. The relationship between building conditions and student achievement has been debated since the early 1960's. In fact, debate over equity, efficiency, and accountability started in Texas.

The 1869 Texas Constitution established a public education system for the citizens of Texas. Authority over the education of children within their boundaries was given to cities in 1875. Although attending school was optional, enrollment across the state grew. According to the 1875 amendment, public education would be funded through local property taxes and expenditures for school buildings funded through public bonds. In 1908, an additional amendment mandated the education of all elementary-aged children within the boundaries of a city. Cities soon became aware of the inequities of a system that relies on property taxes for support. Rural towns and cities with a small tax base found it increasingly difficult to keep their doors open and practically impossible to obtain a reasonable rating for their bonds.

In 1949, a new plan for financing Texas education was introduced through the Gilmer-Aikin Bill. The bill contained incentives for cities to consolidate in order to alleviate their debt. Unfortunately, cities were reluctant to take advantage of consolidation. As a result, the Guaranteed Bond Program was established in 1984 and was backed by the state's Permanent School Fund. This bond program

supported districts and assisted in them in securing bonds at the best interest rate possible.

Facilities became an issue of equity in the original brief filed on behalf of the plaintiffs in Texas in May of 1984. In Edgewood Independent School District, et al. v. Raymon L. Bynum, Commissioner of Education, et. al., the parties bringing the suit alleged that the state's finance system contained the following inequities:

- extreme ranges of wealth in taxable property value among school districts;
- lack of money to fund building, renovation or capital improvements;
- hold harmless clauses, that increase expenditure disparities and decrease state funds available for redistribution;
- actual accountable costs of financing an equitable education were not considered;
- flat per-capita grants given regardless of wealth;
- the use of property values that are two or more years old, thus providing lag time that is an advantage to wealthy, growing districts;
- equalization aid that is inadequate to fund educational programs in property-poor districts;
- property poor districts inability to pay competitive salaries and attract superior teachers is due to personnel unit funding;

- advantages to wealthy districts due to local fund assignment levels that result in savings to wealthy districts and less money for equalization aid;
- per capita amounts that are too low for bilingual education, affecting property-poor districts more heavily than wealthier districts;
- a finance system that is complicated and which gives an advantage to wealthy districts;
- formulas, statutes, and rules implemented with the knowledge that they result in continued disparities in the ability to provide equitable education to the children of the state (Strain, 1985).

The plaintiffs claimed that the system discriminated against taxpayers, parents and children in property-poor districts, thus violating the individual plaintiffs' rights as guaranteed in the Texas Constitution. Several of the original claims were settled following House Bill 72, but the original plaintiffs filed an amended brief on March 5, 1985. Among other inequities, they cited the state's continued negligence by not providing funds for construction and renovation of school buildings or capital improvements. They also pointed out that when property-poor districts were faced with rectifying facility shortages, remodeling or replacing inferior facilities, they had to tax themselves at significantly higher levels than property-rich districts in order to get funds for construction.

Following Judge Clark's 1987 ruling, the Texas Legislature has tried to address facility equity in several different ways. In 1989, the School Facilities Advisory Committee was established. It was charged with conducting school facilities inventories and establishing facility standards. In 1995, the legislature authorized $170 million for the Facilities Assistance Grant program. Although it helped somewhat, property-poor school districts still struggled to obtain funds for school improvements. In 1997, $200 million was placed in a program called the Instructional Facilities Allotment (IFA). This allotment guaranteed state aid for debt service payments. While Instructional Facility Allotment has helped districts across Texas, access to this allotment by property-poor districts continues to be hotly debated.

Research Questions

Three research questions guided this study:

1. What factors directly affect the decision to include facilities as a component of educational adequacy?
2. How does availability of funds impact priorities regarding maintenance, renovation, and construction of facilities?
3. To what extent can student achievement on the TAAS test be explained by socio-economic condition, school size, building age, cleanliness,

maintenance, and the condition of the school's structure? (Lanham, 1999)

Purpose of the Study

The educational process is a complex system. No one part can stand alone, and the influence of each is intermingled. The purpose of this study was to explore the effect that school facilities have on student achievement as measured by the TAAS test in a high-performing, high-poverty school district in Texas. Since the goal of the Texas education system is to improve student achievement, the identification of barriers to achievement brought on by the lack of access to money for facility improvement or local budget constraints that prevent needed facility upgrades is important.

Significance of the Study

Educators and lawmakers must consider the role that school facilities play in providing an equitable, efficient and quality education as they continue their efforts to improve student achievement. Identification of specific factors that contribute to student achievement can help facility planners, administrators, teachers, and lawmakers prioritize their struggle to provide access to a quality education for all Texas youth.

Issues concerning equity, adequacy and access continue in Texas. Recent studies have investigated links between facilities and student achievement in both rural and urban settings. Since most students spend up to 24,000 hours between grades one and 12 within the walls of a school, educators must investigate possible links between building conditions and student achievement (Cash, 1993; Lemasters, 1997). This study examined the change in student achievement over an eight-year period in a high-performing, high-poverty district in Texas and explored the role facilities played in that achievement. Since Texans are asked to spend millions of dollars each year maintaining, improving and constructing school facilities, it is important to know if the dollars spent through this effort contribute to student achievement.

This study was timely in its examination of school facility conditions and student achievement in light of discussions surrounding the budget cuts on the state level and access to funds by poor districts. While Texas lawmakers have Texas students' best interest at heart, without supporting data, it is difficult for them to understand the financial impact of their decisions on individual districts and student already marginalized due to their socio-economic condition. Local school boards are often faced with difficult decisions concerning the use of funds that have not grown proportionally to meet the increasing demands of student growth, program development, school facility maintenance, teacher salaries, and general inflation. Local districts must prioritize their money to enact mandated

programs and provide the funds for expenditures necessary to meet accreditation standards even though these expenditures might not address the district's most pressing needs as defined by the district. The results from this study combined with those of Edwards (1991), Cash (1993), Hines (1996), Lanham (1999), and others can provide Texas citizens and lawmakers with additional information as they debate necessary changes in Texas school funding procedures and equal access issues for all Texas schools.

Methodology

Since the days of the one-room schoolhouse, communities have joined together to provide their children with places to learn. As a result, city planners often point to school facilities as examples of their stewardship and the importance education is to their community. Time, effort, and expense have contributed to the planning of these structures. In fact, many changes in school facility design are a result of facility research, pointing out a connection between particular components of school facilities and student achievement (Cash, 1993; Hines, 1996; Lemasters, 1997; Lanham, 1999).

This research used a mixed-method design investigating the link between school facilities and student achievement in the Ysleta Independent School District. Ysleta is a high-poverty, high-achieving school district and has been

included in recent studies investigating student achievement. This study investigated whether the condition of Ysleta's school facilities contributed to the improved student achievement over an eight-year period. Information was gathered concerning the district's access to funds for facility maintenance and improvement, as well as decisions made by the district regarding those funds that it considers instrumental to student achievement.

Definitions

Average Daily Attendance (ADA) is the average number of students in attendance. This number is used to entitle the school district to funding allotments based on the state's foundation funding formulas (Texas School Law Bulletin, 1994).

Bonds are certificates of debt issued by a government or corporation guaranteeing payment of the original investment plus interest by a specified future date. Municipal bonds are issued by a city or its government and require public approval.

Classroom Structure is the way in which a teacher arranges the presentation of the course content.

Climate Conditions are the temperature and humidity of the building.

Color is the hue of paint used for interior and exterior walls and furnishings.

Commonwealth Assessment of Physical Environment (CAPE) is an instrument developed by Cash (1993) and used by Hines (1996) and Lanham (1999) to rate facilities on such factors as climate control, acoustics, illumination, student density, science equipment adequacy, building age, and cosmetic facility condition.

Density is the number of students versus the classroom square footage.

Economically Disadvantaged Student is a student who is eligible to participate in the National Free or Reduced Lunch Program established by 42 USC 1751 Et. Seq. TEC 5.00.

Equalization is the attempt to compensate for differences in order to make several things equal. Wealth equalization compensates for differences in a school district's ability to provide funds for education in order to achieve student equity or taxpayer equity (Funk, 1980).

Facilities are limited to buildings specifically used for education. These are often referred to as schools.

Flat Grant provides districts a set amount of money that is legislatively determined on some distribution basis. Flat grants are available to all districts within the state and are not dependent on district wealth.

Foundation School Program is the program under which Texas public school districts receive resources to provide basic instruction and facilities to eligible school districts. It refers to the amount the state has determined is necessary for an adequate education. This program also establishes the fiscal obligation by the state.

Full State Support implies a major commitment by the state to a building program. Under this plan, the state accepts the responsibility for education rather than the local district (Thompson, 1988).

Instructional Facilities Allotment is a program contained in House Bill 4 (HB 4) enacted by the 75th Texas Legislature to equalize the burdens of debt service in financing school construction and which appropriated $200 million toward school construction. The 76th Legislature appropriated an additional $150 million for new applications in the 1999-2001 biennium.

Lighting is the process used to illuminate the classroom or the school building.

Maintenance and Operation Taxes (M & O Taxes) are local school taxes determined by the city in which the district resides.

Maintenance is the process of maintaining the integrity of the infrastructure of the school building.

Noise is sound that competes or interferes with student concentration.

Percentage Matching Grants provide funds to districts on the same cost-share basis as equalization grants only with a fixed level of state commitment (Thompson, 1988).

Public Education Information Management System (PEIMS), founded through the Texas Education Code, contains only the data necessary for the legislature and the Texas Education Agency (TEA) to perform their legally authorized functions in overseeing public education in Texas.

Statistical Package for the Social Sciences (SPSS) is a software package used for conducting statistical analyses, manipulating data, and generating tables and graphs that summarize data. Statistical analyses range from basic descriptive statistics, such as averages and frequencies, to advanced inferential statistics, such as regression models, analysis of variance, and factor analysis.

Socioeconomic Status (SES) is defined as the ratio of students on fee and reduced lunch to the number of students enrolled in the school. This factor is used as a covariant to control achievement related to SES.

State Board of Education (SBOE) is assigned specific rulemaking authority under the Texas Education Code. SBOE rules are codified under the Texas Administrative Code (TAC). The TAC is the official compilation of all final state agency rules published in the *Texas Register*.

State Loan Programs are programs that many states use to provide funds to school districts. These loans often have lower interest rates and are backed by the state.

State and Local Authorities allow the use of private capital to construct and lease or lease-purchase school buildings.

Student Achievement is measured based on standardized scores on various achievement tests.

System refers to the components of education, both physical and psychological, that come together during the educational process.

Texas Administrative Code (TAC) is rules adopted by the State Board of Education or Commission of Education under authority granted by state law.

Texas Assessment of Academic Skills is a statewide assessment program consisting of standardized subtests in verbal, math and writing skills.

Texas Education Agency (TEA) was established by the Texas Legislature as the accrediting body of the Texas public schools.

Texas Education Code (TEC) was established by the Texas Legislature. It is the actual articulation of the statutes governing public education in Texas.

Tier II refers to the Texas Legislature's attempt to equalize school funds for Texas school districts.

Limitations and Delimitations

The complexity of learning and the system of education limit this study. Although this research can identify the possible effect facilities have on student achievement, it cannot conclude that school facility conditions alone result in, lead to, or cause student achievement. Further, while the information gleaned from this investigation is noteworthy and informative, generalizations should be avoided.

The delimitations of this study are a result of the relatively narrow scope of this research. It is caused by the use of one school district being purposely chosen due to its high poverty, based on a ratio of students qualifying for the free lunch, and its ability to improve student achievement from low performing to recognized based on its students' TAAS test results.

The value of this research is that while it cannot establish causal relationships with any degree of certainty between school facilities, access and use of funds, and student achievement, it can provide taxpayers, educators and lawmakers important information regarding a possible barrier to equal access and adequacy.

Summary

Successful efforts to improve student achievement are targeted, complex and systemic. While improved curriculum, innovative teacher training, better

methods of delivery, and effective administrative leadership cannot be underestimated, the condition of the buildings that house America's school systems call for investigation. Adding to the complexity of the problem is the lack of study in this area and the difficulty in establishing reliable and valid methods of investigation.

In Chapter I, the purpose, need and significance of the study are introduced. The purpose of this study was to investigate the effect school facility conditions have on student achievement. Educators and lawmakers must continue to seek ways for all students to access a quality education. It is significant due to the high cost of maintenance and construction and the need for local districts to prioritize their spending.

In Chapter II, a review of the literature presents the historical background of school facilities and the related research that helps to frame the problem of student achievement. Research on the historic perspective of school facilities, the physiological effects of facilities, the psychological effects of facilities, the educational effects of facilities, access obstacles, and litigation regarding access, equity and school facilities. In addition, the literature review will examine studies on Texas policies regarding school facilities as well as forecast needs for further study.

In Chapter III, the methodology of the study will be described, and in Chapters IV and V, the findings will be analyzed. Chapter IV will include a

description of the risky decisions, powerful people, accountability and the belief by leaders in the Ysleta ISD that school facility conditions make a difference, as well as the data resulting from a survey sent to the participating school's principals. In Chapter V, an analysis of the findings will accompany a discussion of the conclusions, implications, and recommendations for further study.

CHAPTER II

REVIEW OF RELATED LITERATURE

Fifteen years ago the Carnegie Foundation called for the same level of commitment as described in the Higher Education Act of the 1960's to be directed toward overhauling the nation's public school facilities (Carnegie Foundation for Advancement of Teaching, 1988). The Higher Education Act provided colleges and universities with funds for facilities in order to prepare for the huge influx of students following World War II. Today billions of dollars are needed to refurbish public school facilities, fund new construction, accommodate changing programs and philosophies, and bring public schools into compliance with current safety regulations.

In Chapter II, relevant literature linking school facility conditions and student achievement will be reviewed. Specific studies, advocacy papers, speeches, and reports will be examined to determine the extent to which facilities could be a factor in a student's academic success. Further, an examination concerning the extent to which obstacles prevent high-performing, high-poverty districts' access to state aid and money provided through bonds for facility improvements will be reviewed. The chapter will conclude with information specific to Texas school facilities and literature pointing to the need for continued

attention regarding Texas property poor districts and their students' rights to an equitable, adequate and accessible public school system.

Historical Perspective of School Facilities

Americans have always believed that regardless of the odds or the venture; they will not only dominate but will also lead the world. Unfortunately, the tendency by Americans to expect 21st century academic excellence using 50-year-old equipment and facilities has backfired with regards to student achievement. When it comes to educating their youth, Americans continue to find themselves woefully behind other industrialized nations (National Center for Education Statistics, 1999). This has not always been the case. The United States has a history of leading the world in public education.

In 1647, Massachusetts passed the first law charging its citizens with the responsibility of establishing public schools for all elementary children. Every town with more than 50 families was required to form a school. Cities with at least 100 families were required to establish secondary schools, referred to as Latin, program. While colonial school buildings were simple log or wood frame structures with a one-room design, this was not out of line with other structures of the time. Most churches, businesses and homes consisted of one room, and these one-room schoolhouses were often the focal point for the community. In 1847, the

Quincy Grammar School lead the nation to a new era by dividing the school by age groups and teaching each group separately. Again in 1848, the Quincy School set the standard for the American approach to educating children when it moved to a new building complete with twelve rooms to provide instruction of the different age groups. Across the nation, schools rushed to upgrade their facilities in order to accommodate the belief that students needed to be grouped by age. As a result after 1900, most schools were built of brick, grouped students by age level, and often served as centers of their communities.

Schools continued to expand and soon housed gymnasiums and community areas. Following World War II, the baby boom caused communities to establish massive building plans. During the early 1950's, schools sprang up across the country to house this huge group of baby boomers. By the 1960's, the United States had successfully placed a man on the moon and American student achievement led all industrialized nations (Lackney, 1999). Forty years later over half of American's school-age children attended class in schools built during the 1950's. Curiously, when compared to other industrialized nations, the United States' student achievement was significantly behind Singapore, Korea, Japan, Hong Kong, the Netherlands, Czech Republic, Austria, and Australia, holding its own only against Ireland, Hungary, Canada, Israel, and England (National Center for Education Statistics, 1998). Certainly many factors contributed to this fall, but

the impact the condition of the facilities have on American children while they are being educated should not be ignored.

Physiological Effects of Facilities

Between grades one and 12, one out of every three children attends a school that is in disrepair (Lackney, 1999). As a result, many American students and teachers find themselves in physical environments that may adversely affect them physically and psychologically. Unfortunately, school districts often elect to postpone repairs and delay construction of new facilities to save money during periods of financial shortage. A national survey conducted by the American Association of School Administrators found that 74 percent of school facilities should be replaced or repaired immediately; another 12 percent were identified as inadequate places of learning (Hanson, 1992). Due to fiscal restrains and obligations to mandated state and federal programs, making cuts in facility maintenance is often considered less devastating than slashing academic programs. The fallout of such decisions, however, is that the conditions of school facilities in the U.S. are rapidly failing.

People are influenced and affected by their environment (Hanson, 1992). Deferred maintenance can create an environment of peeling paint, crumbling plaster, nonfunctioning toilets, poor lighting, inadequate ventilation, and inoperative heating and cooling systems. Research indicates that the quality of air

inside public school facilities may significantly affect students' ability to concentrate (Lemasters, 1997). The Carnegie Foundation for the Advancement of Teaching found that in schools that are underfunded, morale is low, facilities are decaying, and the dropout rate remains high year after year (Carnegie Foundation for the Advancement of Teaching, 1988).

Several studies have been conducted tying conditions of school facilities to student achievement. In 1979, Carol Weinstein investigated the "relationship of facilities and student achievement." She conducted a meta-analysis of 141 published studies plus 21 additional references and reported her findings in the Review of Educational Research (p. 577). Three years later, Carrol McGuffey (1982) compiled a review of the research. These two reviews cited a total of 238 research studies and 21 paper presentations. McGuffey found that old and obsolete buildings do have a negative effect upon the learning process of students and that safe, modern, and controlled environment facilities enhance the learning process. He also stated that school facilities might have a differential impact upon the performance of students in different ages and subjects. Eight of the nine studies McGuffey reviewed found a significant relationship between a controlled environment and student achievement. Good lighting quality was found to relate positively to increases in student achievement and performance. Unfortunately the review was hampered by the quality of the individual studies and McGuffey warned that his research had limitations because it was a "…mixed bag of study

types and methodologies presenting diverse problems of sampling, measurement, and statistical analysis" (p. 272). While McGuffey acknowledged that the explainable variance in learning that can be attributed to the school building is small, she went on to say that influences on student achievement caused by building conditions may be large when considered in relation with all the variables over which the school system has control.

While attending Indiana State University, Kozol (1991) conducted a study that examined the effect of the physical features of an elementary classroom on the learning environment. Three hundred principals were randomly selected from all K-6 schools in Indiana to complete a survey that examined classroom equipment and features, floor coverings, wall surfaces, lighting, paint color, windows, restrooms, storage space, and technology. He found a statistical significance with every component identified. He recommended the areas found significant to be included in renovation and construction in Indiana schools. He also recommended further study using a survey of teachers to compare to the principals' results.

Kozol's study was followed by Berner's (1993) Georgetown University master's thesis study relating school facility conditions, parent involvement and student achievement. This study investigated school facility conditions for 41 of the 52 Washington, DC schools. She used a multiple regression technique with two models to analyze the data. In addition, the Committee on Public Education measurement instrument was used to determine the condition of the buildings.

The first regression recorded the school building condition as the dependent variable. The independent variables included building age, grade designation of building (elementary, middle, high school, etc), mean neighborhood income, PTA membership per student, PTA income per student, ethnic breakdown and total enrollment. School age was found to a significant predictor ($p<.10$) of building condition. She found that as the population of the school grew, the building condition improved. School enrollment was a significant predictor of school condition ($p<.05$). She also found that as the PTA budget grew, the condition of the school improved ($p<.10$). For the second regression, Berner (1993) used all 52 schools within the District of Columbia Public School System. Building condition was once again used as the dependent variable. The results were very near the first regression as building type ($p<.01$), building age ($p<.10$), and school enrollment ($p<.05$) were found to be significant. One additional variable was found to be significant. As the mean neighborhood income increased, so did the condition of the school ($p<.10$). (Berner, 1993)

In Berner's (1993) second model, student achievement as measured by the Comprehensive Test of Basic Skills (CTBS) and student achievement was used as the dependent variable. School type, school age, mean neighborhood income, PTA membership per student, PTA income per student, building condition, ethnicity of the building and total school enrollment were used as the independent variables. School enrollment was at $p<.05$ percent, Caucasians was at $p<.05$,

building condition was at $p<.05$ and mean neighborhood income was at $p<.05$. These results were found to be significant. There were several problems with the study. Berner (1993) noted the small sample size as being a limitation of the study. Further, information concerning the PTA was noted in her conclusions to be suspect. She also used .10 as her predetermined alpha. Since this is not consistent with other studies it made the interpretation difficult. Nonetheless, Berner's findings relating academic performance to building conditions are widely quoted (Berner, 1993).

Lemaster's 1997 meta-analysis also reviewed the relationship between student achievement and school facilities. Her investigation found that students had higher achievement scores in newer facilities. In addition, there were fewer discipline problems, and attendance records were better in new facilities. Further, the social climate perceived by students was considerably more favorable in new schools. Lemasters also found that as the condition of the facility improved, achievement improved. Her study indicates that higher student achievement was associated with schools with better science laboratories and that the attitude toward the science classroom predicted science achievement. In fact, there was higher achievement in air-conditioned schools and schools with pastel painted walls; a cause-effect relationship between the variables of color and light was that shades of blue significantly reduced blood pressure. Finally, Lemasters found that there was higher student achievement with less external noise.

Psychological Effects of Facilities

Schools play a symbolic role in their communities, and their appearance carries a strong message about community values and the importance of education. They provide a setting where students, teachers, parents, and the community at large interact (Uline, 1997). Unfortunately, a building that lacks heat, is unsafe, is inadequately equipped, and is poorly maintained sends a negative message to students and faculty (Lackney, 1999). School facilities are loaded with symbolic overtones (Oritz, 1994).

Edwards (1992) investigated the relationship between parental involvement, school building condition, and student achievement in Washington, D.C. schools. She hypothesized that the condition of the school was directly affected by parent involvement and that the condition of the school affected student achievement. She found that in those schools where large numbers of parents were involved through membership in the PTA, the buildings were in better condition than where parents had limited or no involvement. She further determined that building condition did have an effect upon student achievement. Her study revealed that achievement scores could increase 5.455 percentage points because of the physical condition of the school. In her study, when the school's physical environment moved two categories, such as from poor to excellent, the achievement scores increased 10.9 percentage points. Conversely, based upon analysis, "the signs of the estimated building condition coefficients are negative,

meaning that from our base of excellent schools, a building condition of fair or poor will reduce the average student achievement score" (Edwards, 1992, p. 24).

Overbaugh (1990) studied the relationship between facilities and the professional performance of teachers. The study included elementary and secondary State Teachers of the Year. Of the fifty-three teachers asked to participate, forty-three completed the questionnaire. Twenty-two were secondary and sixteen were elementary, and their years of experience were from 5-41 years. The number of years they had been at their current building was from 1-11 years. The questionnaire asked twenty questions concerning aspects of their school's physical environment. Twenty-seven of the respondents taught in self-contained classrooms. Respondents found thirteen of the twenty environmental factors satisfactory or better, and seven factors were listed by the participants as unsatisfactory (Overbaugh, 1990).

Overbaugh also examined the information by gender, teacher grade level, and experience. He found gender and teaching level produced the most significant variance by using chi-square to test the results. Several conclusions were determined from the study. In individual classrooms, size, acoustics, and thermal conditions were identified as negative features. The items that most influenced a teacher's professional behavior were classroom furnishings, equipment, and classroom appearance. Further, teachers identified space utilization, classroom size, thermal conditions, and acoustics as being very important. Elementary

teachers also stressed that storage and conference areas were very important. Secondary teachers ranked a faculty lounge, separate dining areas, and access to a private phone as being the most important physical features (Overbaugh, 1990).

Educational Effects of Facilities

One of the first studies to investigate student achievement and building condition was a study by T.C. Chan in 1980. Chan's study included schools with eighth graders during the 1975-76 school year. He divided the schools up into three categories based on age and type of problems. There were older buildings that had not been renovated, buildings with partial renovation, and new buildings. School principals were surveyed and provided Chan with data concerning the building and Iowa Test of Basic Skills achievement scores for the year 1975-76. Chan used building age and socioeconomic status as the independent variables and mean test scores in vocabulary, reading, language, work-study, mathematics, and the school composite number for the dependent variables. Both multiple regression and analysis of covariance were used to examine the relationships. When controlling for socioeconomic status, building age was significant for vocabulary, mathematics, and the composite test results (Chan, 1980). Building age was found to account for 1.92 percent of the variance in the vocabulary score, 1.13 for mathematics and .98 percent for the composite score. Chan concluded that building age played a significant role in the achievement of the eighth graders

in the study. While the percentages of variance are relatively small, they do indicate influences on student achievement.

Bowers and Burkett (1987) from East Tennessee State University studied the relationship between school facility characteristics and student achievement in two rural Tennessee schools in 1983-84. They studied the division's oldest and newest schools. The older school was built in 1939 and contained an addition from 1950, and the new building was built in 1983. The new building housed 758 students and had a capacity of 825. The new building was well-equipped and contained state of the art equipment and systems that included air conditioning, central heating, fluorescent lighting, acoustical controls, and appropriate furniture. The older school had a capacity for 650. It was heated by a coal-fired furnace and had no central air conditioning unit. Much of the furniture was outdated, and aesthetically, the building had several outdated colors. The study used fourth and sixth graders from the 1986-1987 school year who were randomly selected from the two buildings (Bowers & Burkett, 1988). There were 127 students from the older building and 132 from the new building. The authors of the study determined that there was no need to control for socioeconomic status due to their similarity (Bowers & Burkett, 1987).

They analyzed the data using an analysis of variance, t-tests, and chi-square. They listed their null hypothesis, as a school's physical environment does not produce statistically significant achievement results. The null hypothesis was

rejected since the study did indicate a statistically significant difference in achievement scores. Students at the new school scored higher, had fewer health problems, and missed fewer days of school. The researchers concluded that the students attending school in the newer school building had significantly better educational achievement than those attending the older building, and they encouraged decision makers to consider the benefits of modern facilities (Bowers & Burkett, 1987).

In 1993 Cash investigated the relationship between the condition of the school building and student achievement and student behavior in all 47 small rural high schools in Virginia. She used the Commonwealth Assessment of Physical Environment to control for building condition. Student achievement scores were adjusted for socioeconomic status. Conditions of the school facilities were divided by structure and cosmetic condition. Cash found that student achievement improvements were directly related to the facility's cosmetic factors. Specifically, Cash found that pastel walls positively influenced student achievement as compared to white walls (Cash, 1993).

Hines conducted an investigation in 1996 similar to Cash's 1993 study and Earthman, Cash, and Van Berkum's 1995 study. He used large urban high schools located in the Commonwealth of Virginia, rather than Cash's small rural high schools throughout Virginia. Hines predicted there would be a relationship between the condition of school buildings and student achievement and behavior.

He determined the condition of the building using the Commonwealth Assessment of Physical Environment instrument. Personnel from each school completed the instrument and rated their campus as substandard, standard, or above standard. Student achievement levels were determined by the eleventh grade Test of Academic Proficiency. Scores were adjusted for socioeconomic status by using the free and reduced-priced lunch eligibility. Like Cash, Hines found that school facility conditions influence student achievement.

In 1999, James Lanham studied Virginia's public elementary schools. Prior to his study high schools in both rural and urban Virginia were studied (Cash, 1993; Hines, 1996). During the 1997-1998 school year, all Virginia's elementary schools were assessed using a state standardized test, Standards of Learning Assessments. The Virginia Board of Education had placed benchmarks for student performance and for the first time tied student performance to school accreditation (Virginia State Board of Education, 1997). Lanham chose 300 elementary schools out of the 989 schools in the state that contained both 3rd and 5th grades using data from the Department of Education database. One of the school's chosen lacked 5th grade and the sample set was reduced to 299. After sending each school principal a survey, he received 190 of the surveys back. Although Lanham did not look at them separately, twenty percent of those responding to the survey indicated their school had undergone significant renovations within the last five years (Lanham, 1999).

Lanham's survey was based on the Commonwealth Assessment of Physical Environment (CAPE) and contained thirty-two questions rating specific features of school buildings and classrooms. The CAPE survey was used by Cash (1993), Hines (1996), and Earthman, Cash and Van Berkum (1995) for their investigations of building conditions and student achievement. Lanham eliminated questions specific to high schools and added questions concerning building age, acreage of school campus, percentage of student approved for free or reduced lunch, technology readiness, and specific free response questions.

The survey was designed to obtain either a specific numerical answer from the respondent or a numerical answer chosen from a list of choices. In all cases the responses were written in ascending order so that the most positive response was offered first and received a code of "5," the next most positive response was offered second and received a code of "4," until there was a choice for no response and it was coded "0." For questions requiring a yes or not, yes was coded as a "2" and no coded as a "1". The numerical responses were analyzed using the Statistical Package for the Social Sciences (SPSS).

The Standards of Learning Assessment was used to measure student achievement. This assessment was administered to all third and fifth graders in the spring of 1998. The Virginia Department of Education's Division of Assessment and Testing provides assessment scores. The test includes sub-tests in English, mathematics, science and social studies. Fifth graders take additional sub-tests in

English writing, history, computers and technology. The percentage of students passing with a score of 70percent or above was used for Lanham's analysis. Lanham noted that reliance on the Standard of Learning Assessment limited the comparability of his results to student achievement in other states.

A Pearson's product moment correlation matrix and a step-wise multiple regression analysis was performed on the data. Multiple Regression was used to provide the researcher with the relationship between the identified dependent variables and the independent variables. Multiple regression analysis was conducted for each of the predictor variables. A pre-determined alpha of .05 was used for significance.

Lanham ran five regressions. A step-wise multiple regression analysis was conducted using third-grade English Assessment Scores as the criterion variable. Five predictor variables were found to be significant in explaining the differences in third-grade English test results. Economically disadvantaged students identified by their inclusion in the free or reduced lunch program accounted for the largest portion of the variance (48.6percent). Other significant predictors were ceiling type (3.0percent), air conditioning (1.6percent), campus size (1.6percent) and frequency of sweeping (1.7percent). A second step-wise multiple regression was conducted using fifth grade results on the English Assessment as the criterion variable. Two variables were found to be significant. They were economically disadvantaged students (52.2percent) and computer network connection

(2.1percent). A third step-wise multiple regression was conducted using third grade results on the Math Assessment as a criterion variable. Three variables were found to be significant in explaining the differences. They were economically disadvantaged students (25.9percent), room structure (3.8percent), and floor mopping (2.5percent). A forth step-wise multiple regression was conducted using fifth grade results on the Math Assessment as a criterion variable. Two variables emerged as significant. They were economically disadvantaged students (15.8percent) and air conditioning (2.8percent). Finally, a fifth step-wise multiple regression was conducted using fifth grade results on the Technology Assessment as the criterion variable. Five variables emerged as significant. They were economically disadvantaged students (41.9percent), air conditioning (4.8percent), ceiling type (3.6), overall building maintenance (2.9), and floor type (1.5percent). No other variables entered the equations.

Economically disadvantaged students emerged as the first significant variable in each equation. Further, air conditioning emerged in three of the five regression analyses. Interestingly, the finding relating to air conditioning parallel the results found by Cash (1993), Hines (1996), and Earthman, Cash and Van Berkum (1996). Lanham concluded that certain building and cosmetic characteristics when combined with socio-economic information, can explain the variance in student achievement on the Standards of Learning Assessment in English, mathematics and technology. He suggested that improving particular

building conditions such as air conditioning could improve student achievement. Building cleanliness emerged in three of the five regressions as significant in Lanham, as well as Hines' (1996) studies. Lanham further recommended that improving building cleanliness would have a positive impact on student achievement. Finally, Lanham pointed out that older buildings often lack the flexibility needed for today's innovative technology requirements and their physical structure often limit the building's adaptability for technology updates. He further concluded that continued use of older buildings could psychologically send the wrong message to teachers, parents and students concerning their importance to the district.

Access Obstacles to State Aid and to Adequate Funds for Maintenance, Renovation, and Construction of Facilities

Although links between specific financial expenditures and educational outputs have been extensively reviewed, "little research has been done on the inability to repair and refurbish school buildings due to lack of funds" (Berner, 1993). There were a few studies that investigated money and student achievement. Hanushek (1981) found no significant difference when using a production function equation designed to measure inputs and outputs and their relationship to student achievement. Likewise Summers and Wolfe (1975) investigated family income and race as factors in student achievement and found no significant impact.

Greenwald, Hedges, and Laine (1994) reviewed Hanushek's study by using vote-counting and regression studies to determine if any correlations existed. In their reanalysis Greenwald, Hedges, and Laine used combined significance tests to group data from small studies. They looked at teacher education, teacher salary, and teacher pupil ratio and found a positive significance at $p = .05$. These results challenge the notion that money does not matter (Greenwald, Hedges, and Laine, 1994). However the difficulty in defining and isolating expenditure variables and linking them to student achievement remains difficult and is a weakness of these studies.

State and federal mandates for educational programs and environmental safety are seldom accompanied by the funds needed to implement them (Ferguson, 1991). These mandates place a financial burden on local districts, and in most cases, districts are forced to rely on their taxpayers' ability or willingness to help relieve this burden. Although this results in glaring inequities in school environments among districts in the same state, causal relationships have been difficult to pinpoint (Lewis, 1989). This lack of causal relationships between instruction and results makes it difficult to discern a standard measure for student achievement and building condition (Kazal-Thresher, 1993). It is also extremely difficult to establish a standard for spending among geographic regions, since most studies are conducted in single school divisions and are regional in nature (Wenglinsky, 1997).

States regularly grapple with budget shortfalls and nationally costs related to deferring maintenance quadrupled between 1983 and 1991, from $25 billion in 1983 to $100 billion in 1991 (Hanson, 1992). Consequences of electing to defer maintenance include premature building deterioration, indoor air problems, increased repair and replacement costs, and reduced operating efficiency of equipment. Unfortunately, when energy costs exceed budgeted amounts, 40 percent of districts across the country report using funds earmarked for maintenance to meet energy-related expenses (Hanson, 1992).

Some of the most noteworthy research that contributed to the litigation concerning equity issues was conducted in Washington D.C., North Dakota, and Virginia. In 1991 Edwards conducted a study in Washington, D.C. using 191 facilities that housed approximately 83,000 young people. She believed that poorly maintained buildings sent negative messages to students and that these negative messages contributed to poor performance by students. A regression formula was used to investigate the impact of parent involvement on building conditions. Building condition was used as a dependent variable, the type of school, parent involvement, building age, income, race and enrollment was used as the independent variables. Edwards ran several regressions. The students' achievement was recorded using the Comprehensive Test of Basic Skills. Edwards assembled a group of volunteer maintenance workers, engineers, and architects. These professionals visited each school and reported on the buildings'

condition. They estimated the cost of repairing the building and rated the building's condition as poor, fair, or excellent. Age was found to be a strong predictor of the condition of the school. The findings supported that good infrastructure and well-maintained buildings are the foundation of quality education. "As a school moved from one category to the next with the evaluation of the building's condition, average achievement scores could be expected to increase by 5.455 points" (Edwards, 1991).

Cash investigated the relationship between certain school building conditions, student achievement, and student behavior in rural high schools in Virginia in 1993. A data-gathering instrument used by local personnel determined the condition. It addressed certain building conditions. Results indicated a positive correlation between building condition and achievement of students. In all the sub-tests of the Test of Academic Proficiency (TAP), academic performance was positively related to the condition of the school building. Cash found student achievement was higher in those schools with higher quality ratings. The difference in percentile ranking was as much as five percent.

A similar study was conducted by Earthman, Cash and Van Berkum (1995), using the same methodology as the Cash study. The self-evaluation methodology was utilized to obtain rankings of substandard, standard, and above standard buildings. The study was conducted in North Dakota and included all 199 high school buildings in the state. Student scores on the Comprehensive Test

of Basic Skills (CTBS) administered to all 11th graders throughout the state was used for student achievement. In all sub-tests of the CTBS except two, the students in above-standard buildings outscored students in substandard buildings. For those buildings scoring at the above-standard level on the State Assessment of Facilities in Education (SAFE), there was a significant difference in all sub-tests except Language Mechanics. The difference ranged from 4 to 11 points. Although the percentile differences were not as great as those found in the Cash study, this study does support the findings of both Edwards and Cash.

Hines used the same methodology as Cash but substituted large urban high schools in Virginia for the large rural school districts as the population variable (Hines, 1996). School administrators completed the Commonwealth Assessment of Physical Environment (CAPE) to determine the condition of the school. The instrument allowed them to rank the school buildings as substandard, standard, and above standard. Further, building conditions were divided into cosmetic and structural. The results of his study were the same. In fact, some of the differences were as high as 11 percentile points. All four studies used building condition as a factor to classify the school buildings for analysis. The factor of building condition was determined by the responses to questions relating to certain attributes or conditions in the building. Each question concerned building attributes and conditions that were individually identified in previous research studies to be directly related to student achievement. Like previous studies,

building condition was found to influence student achievement. Washington D.C., North Dakota, and Virginia have used these studies to help redefine state spending.

With the cost of construction skyrocketing, efforts to justify these costs academically become increasingly more important. More than $15 billion was spent on school remodeling and new construction in 1998 (Glass, 1999). Nationally a building costs an average of $100 per square foot, but there are many hidden costs (Rivera-Batiz & Marti, 1995). Inefficiency of school design is one of the important and expensive hidden costs. Most districts lack the qualified personnel needed to challenge inadequate building design and as a result hidden costs and change orders account for an average of approximately 25percent of the project contract (Abramson, 1998). Further, building designs that incorporate ease in retrofitting future school needs are seldom available. The average new elementary school eight years ago costs about $6 million, and the average secondary school about $15 million to construct (GOA, 1995). Unfortunately, high poverty school districts encounter difficulty supporting even routine budgeted expenditures due to their low tax base. Historically these districts' own buildings with the most severe maintenance needs. Because of deferred maintenance these 40-plus-year-old buildings are in extreme need of repair and renovation. This problem is exasperated by these districts' inability to secure much needed construction bonds (Wenglinsky, 1997). If there is a link between student achievement and the environment that school facilities provide, access to facility

improvement funds could provide the key that unlocks low performance by American students across the country.

Litigation Regarding Access, Equity and School Facilities

Despite an almost 50-year history, the impact of litigation regarding access and equity in education is still unclear. There are no universal guidelines for school finance. There is no checklist available concerning an allocation system that will result in quality schools. There is neither a magic potion nor an exact model of teaching that results in high achievement. There is no description of the family structure, socioeconomic status, or level of involvement that consistently results in a successful student. There is no managerial model that, if followed, guarantees students will achieve. Unfortunately, educators, legislators, and the judicial system continue to grapple with the moral dilemma of access and equity; they find it difficult to place quantitative descriptions on this issue of quality. Understandably, the inherent pitfalls of defining and describing quality have led legislators and the court system to move toward the few tangible areas in education that exist. As a result, litigation over schools and, specifically, school finance has been modified to include the question of facility equity. The availability of funds for adequate and equitable school facilities continues to be included in the language of litigation pointing to state funding.

This quest to secure an American right to equal opportunity began with Brown v. Board of Education of Topeka (1954, 347 U.S. 483). Texas joined the fight in 1973 with Rodriquez v. San Antonio Independent School District (411 U.S. 547) when the Supreme Court ruled that education was not a federal responsibility and left this fundamental right to the states. Prior to 1973, most states had altered their method of funding due to Serrano v. Pries (1971, 364 U.S. 479) to include their general fund expenditures in their equalization formulas. The Rodriquez case is important to Texas because it challenged the state's school funding policy. The Shofstall v. Hollins (1973, 427 U.S. 160) decision required Arizona to include capital outlay expenditure and the ability to raise funds through bond elections in their equity formulas. In the New Jersey Robinson v. Cahill (1973, 443 U.S. 449) decision, New Jersey's, and ultimately other states', obligation grew to include capital outlay expenditures. It further stated that without equitable capital expenditures, required educational opportunity would not be possible. The Board of Education of the City of Cincinnati v. Waiter (1977, 102 S. Ct. 3211) found that "qualifications for a thorough and efficient system of schools are not met if any school is starved for funds, teachers, buildings, or equipment." Diaz v. Colorado State Board of Education (1977, 102 U.S. 563) found that "some districts were better able than others to provide adequate facilities." This was followed by Luian v. Colorado State Board of Education (1982, 391 U.S. 563), in which the Supreme Court noted that the "ability of school

districts to raise revenue for bond reduction and capital reserve was a function of property wealth."

A key decision concerning school facilities occurred in 1979. The question of equal opportunity as defined by adequate school buildings came before the West Virginia court in Pauley v. Kelley (1979, 424 U.S. 693). Further articulation of the state's responsibility regarding facilities was included in Pauley v. Bailey (1982, 424 U.S.693) and Pauley v. Gainer (1986, 424 U.S. 693). In 1986, the West Virginia State Supreme Court ruled that education is a constitutional right and districts must provide equal access to all students. The Virginia court defined equal access and included school facilities. They further defined adequate facility space to include elementary, middle, and high school programs. Although Pauley was eventually modified, it set the stage for future cases to include facilities in equal access litigation, and it remains the standard against which potential capital outlay litigation is measured. New Jersey followed West Virginia with Robinson v. Cahill (1973, 443 U.S. 449) and Abbot v. Burke (1988, 395 F. Supp. 294). The courts ruled that the state system of school finance could be found to violate the state constitution. They ruled that socioeconomic status and geographic location could not be a barrier to equal access when determining equal educational opportunity. Texas was ordered to correct similar access issues in schools following Edgewood Independent School District v. Kirby (1987, 777 S. W 2nd 391). The court enjoined Texas state aid distributions but stayed the order to allow

the legislature time to remedy the finance system. The 1987 Edgewood decision was reversed by the Kirkwood case in 1988 but concern over local wealth continues in Texas as well as access issues due to property poor district's inability to access facility funds.

State budget cuts require local districts in Texas to make budget-cutting decisions. Keeping in mind that many Federal and state mandated programs often come without funding and ongoing expenditures for payroll, employee benefits, program costs, state testing, transportation and utilities are immediate and must be met, districts are forced to search their Operational Budgets line-item by line-item for available funds. Facility maintenance repair and renovation budget line items continue to be among the few places available to local districts. While districts know that depleting the money earmarked for facilities to patch budget shortfalls exasperates ongoing and future facility problems, they are often left with no other choice. While property wealthy districts are struggle, property poor districts are profoundly impacted by state budget cuts.

The Texas state constitution promises an equitable educational system. If the condition of Texas school facilities impact student achievement, do the current formulas, statutes, availability and rules for state school funding, when implemented, result in a known continuation of disparity in the ability of local districts to provide an equitable education to the children of Texas (Edgewood, 1987)? Further defining litigation is inevitable.

Texas' Policies Regarding School Facilities

Students, parents, and educators "have a right to expect the state to support education to such an extent that variations in local wealth will not have an adverse effect on local ability to provide an adequate educational system" (Thompson, 1988, p. 27). There are several funding procedures used across the country.

State Loans – This method provides funds to districts using the most favorable interest rates available due to a very strong rating for investors. The district repays the loan directly to the state. The advantage of this method is that districts do not have to seek the funds. Money becomes available to districts and favorable treatment reduces repayment costs. In some circumstances, the state has the ability to forgive the loan for districts unable to pay the loan back. The disadvantage is that districts in need of assistance are the districts that cannot afford the added expense of borrowing money (Texas Law Bulletin, 1994).

State or Local Building Authorities – This method is used in states that have laws that allow for private capital use to construct, lease, or lease-purchase school buildings. The advantage is that a local district is able to access funds for local construction. In addition, the district is able to access resources separate from the school tax base. The disadvantage is that voter opinion can be ignored because a bond election is unnecessary. Another disadvantage is that it intermingles tax dollars with for-profit money (Texas Law Bulletin, 1994).

Full State Funding – Because full state funding translates to the support of the entire state, the advantage of this method is that it provides the broadest possible tax base and provides access to multiple resources from the state to local school districts. The disadvantage is that local school districts lose control over local education due to the state's sole or a major role as the funding source (Texas Law Bulletin, 1994).

Flat Grants – This method provides a set amount of money to the district. The money is distributed to districts in equal amounts. The advantage is that districts receive some funds. The disadvantage is that there is no relationship between the districts' ability to pay for their own needs and the aid received (Texas Law Bulletin, 1994).

Equalization Grant – This method is similar to most equalization formulas. It became popular following the Serrano case. Awards are made using a variety of elaborate percentage matching agreements. In theory, the grant award increases as the ability of the local district to pay decreases. This method ensures poor districts receive more funds than wealthy districts. The major weakness of this method is that the state may not have the financial ability to fund all the identified needs of the districts (Texas Law Bulletin, 1994).

Percent-Matching Grant – This method provides local districts with funds based on a cost-share basis. The level of support is determined by the state legislature. The major advantage to this method is the incentive to local effort

because districts may increase their portion and in that way increase their matching funds. The disadvantage is that the district must have money to receive money. Property poor districts often lack the money (Texas Law Bulletin, 1994).

Texas has tried repeatedly to provide equitable state funding for local districts. In 1997, House Bill 4 of the 75th Legislature created the Instructional Facility Allotment (IFA) to equalize the burdens of debt service in financing school construction and appropriated $200 million toward school construction. The 76th Legislature appropriated an additional $150 million for new applications in the 1999-2001 biennium. In order to receive funds, districts must make application to the Texas Education Agency (TEA). This bond or lease purchase agreement must be used for construction or renovation of a school facility used for instruction. Unfortunately for property poor districts, "instructional facilities" are narrowly defined. Further, the lack of state standards regarding school facilities place the burden of proof on the district with the least amount of resources. The Texas Education Code (TEC) states that the maximum amount a district may receive is determined by their annual debt service or $250 times each student's average daily attendance (ADA). The maximum allowed for districts with fewer than 400 students is $100,000 per year or their actual debt payment (Mac Inroe, 1994).

While the Instructional Facility Allotment (IFA) is designed to assist districts in need, there are several additional barriers for property poor districts. A

district must make application for the funds after a successful bonds election or 60 days after they notify taxpayers concerning a lease-purchase agreement. If the voters call for a referendum, it must take place before the application is submitted. In addition, the district must make their application prior to pricing the bonds. They must plan to pay their portion of the bond for at least eight years, and they must levy sufficient taxes to cover the local share of the IFA. If it is a lease-purchase agreement, the district must levy sufficient M&O taxes to generate adequate Tier II funds to cover the local share. Since property poor districts have a history of unsuccessful bond elections and their ability to levy the taxes is questionable, access to facility funds continues to elude many Texas districts (Lutz, Betz, Maddirala, 1996).

The Need for Further Study Linking Facilities and Achievement in High-Performing, High-Poverty Districts

The Virginia and North Dakota studies of Cash, Hines, Lemasters, Earthman, Van Berkum, and Lanham demonstrate a relationship between student performance and the condition of schools. Additional research indicated a close relationship between the built environment and how well students and teachers perform in it. While extensive research exists connecting leadership, teacher training and curriculum to successful Texas schools, a limited group of studies

exist linking student achievement and building conditions. This research was limited by the complexity of the topic and the research design. Additional research is needed that will investigate facilities and student achievement over time. Further, research is needed to investigate high poverty Texas school districts that have made a transition from low performing to recognized based on results from the TAAS test.

Shortcomings of Previous Studies

Educational research is inherently difficult. Investigating possible links between facilities and student achievement provides additional complexities. Controls are difficult to acquire, and it is hard in an educational setting to assign teachers and students randomly or to have the funding necessary to change randomly the physical settings. There are additional problems in trying to match teaching methods, student abilities, and physical learning climates while conducting research.

Historically, much of educational research is conducted using surveys. While survey research has a long historical tradition as a method of systematic data collection, relationship generalizations are seldom advised. Fortunately, the contribution of twentieth century sociologists Lazarsfeld, Hyman and Stouffer has provided new ways of looking at data. Their development of a procedure to link

instruments of data collection to statistical procedures has made it possible for educators to investigate educational phenomena using surveys.

Studies involving surveys account for a substantial proportion of the research performed in the field of education. Survey research utilizes a variety of instruments and methods to study relationships and comparisons. Although it is assumed that the data collected by survey instruments is quantifiable, any study based on cross-sectional survey data is subject to source error. Respondents may not remember information related to a previous time accurately. Such errors are likely to become larger as the researcher delves farther into the past. Further, some questions might require information or a knowledge set unavailable to the respondent. While answers are given with the best intentions, accuracy is difficult to check. In addition, although factual information may be recalled accurately, the respondent's recollection of past attitudes or opinions may be distorted. In summary, the value of survey research is that it can explore a variety of relationships in a relatively economical way. Its drawback is that information gleaned from surveys relies on the quality of the instrument and the respondents' answers. As a result, it is ill advised to generalize from a survey research study.

The researcher of facilities and student achievement must make conclusions that weigh the difficulties of control in educational research. Studies by Cash, Hines and Lanham were based in part on survey results. In all cases there was a positive difference for students in the better buildings. The range of

difference between the test scores of students in substandard and above-standard school buildings in the Cash, Hines, Earthman, Van Berkum and Lanham studies was 1 to 11 percentage points. These studies found that some of the most important factors that influenced learning are those that relate to control of the thermal environment, proper illumination, adequate space, availability of equipment and furnishings, building condition and building age. Since the majority of recent survey studies, like those from Washington D.C., Virginia and North Dakota, investigate the relationship of student achievement and school facility conditions are from other states, it is important to investigate similar phenomena in Texas.

Theoretical Framework

The stakeholders for this research were the children of Texas. Since 1869, when the Texas Constitution established a public education system, Texans have been charged with educating their youth. Historically, the issues of inequity due to a property-tax-based education system have plagued Texas. The Guaranteed Bond Program was established in 1984, and following several noteworthy court battles, the Instructional Facilities Allotment fund was established in 1997 (Sharp, 1998). This allotment guaranteed state aid for debt service payments. Unfortunately,

access to this allotment by property poor districts and the limited nature of the fund's scope continue to be an issue.

The purpose of this study was to investigate the relationship between student achievement and school facilities for a selected high achieving, high-poverty district in Texas. A significant relationship was found in studies outside Texas and it is assumed that a relationship will be found in Texas schools. If so, access to funds that will enable poor districts to improve their facilities is essential. Texas must accept the responsibility for the future of its youth and assure them that Texas understands that "all the school reforms on earth are worthless if kids have to come to school in buildings that destroy their spirits. The schoolroom is secondary if schooling is used as an excuse for pushing the issue of crumbling buildings far down in the education agenda" (Kozol, 1991).

Summary

Chapter II presented a review of the literature and research that added to the discussion concerning school facilities and student achievement. This chapter included a review of Chan's 1980 study in which he investigated building and student achievement. McGuffey's 1982 investigation identified building age, building maintenance, as well as school size as impacting student achievement. Cash's 1993 study developed a survey instrument and analyzed the results against

student achievement. Cash identified building age and classroom environment as significant influences on the achievement of high school students living in rural Virginia. Hines (1996) and Earthman, Cash and Van Berkum (1995) found building age, noise, and cleanliness as significant contributors to the variance in student achievement. Phillip's (1997) study bolstered their findings by once again noting school age as an important contributor to student achievement. Lanham (1999) concluded that socio-economic status, building age, cleanliness and building maintenance all influenced student achievement.

The following chapter will describe this study's attempt to extend Cash, Hines, Earthman and Lanham's discussion and recommendations concerning the condition of school facilities and student achievement. In Chapter III, the methodology and structure of the study will be described. Chapter IV will present the analysis of the findings, and Chapter V will present the results, make conclusions and give recommendations for further study.

CHAPTER III

METHODOLOGY

Based on research conducted in Washington D.C., Virginia, North Dakota, and other states, there is an expectation that a relationship between student achievement and the condition of school facilities will be found in Texas. Many studies have investigated school facilities; however, this study will focus on an analysis of Ysleta Independent School District. It will investigate the way in which this high-performing, high-poverty district views school facilities as a strategic component to enhancing student achievement. It will investigate:

1. What factors directly affect the decision to include facilities as a component of educational adequacy?
2. How does availability of funds impact priorities regarding maintenance, renovation, and construction of facilities?
3. To what extent can student achievement on the TAAS test be explained by socio-economic condition, school size, building age, cleanliness, maintenance, and the condition of the school's structure?

Population

Previous noteworthy studies linking the condition of schools and student achievement have focused on rural Virginia high schools (Cash, 1993), urban

Virginia high schools (Hines, 1996), a synthesis of Virginia schools (Lemasters, 1997), and Virginia elementary schools (Lanham, 1999). The population for this study is Ysleta Independent School District outside El Paso, Texas. Ysleta was part of the original 1997-98 Dana Study in which high-poverty, high-performing districts were investigated. This district targeted several areas they felt were essential to their success in dramatically impacting student achievement; one of which was the district's facility improvement. While restricting the population to one specifically defined school district limits this study, the data generated can be used to extend the information on school facilities from other states and shine a light on possible predictors in Texas.

Setting

The Texas Education Agency (TEA) oversees the operation of all county and city school districts across the state. Therefore, TEA is responsible for overseeing the education of students in Ysleta (Texas Education Agency, 2000). All public schools in Texas are rated using objectives identified within the Texas Assessment of Academic Skills tests. These objectives are made known through the Texas Board of Education and approved by the Texas Legislature. These standards set clear objectives for the State Board of Education, the Texas Legislature, Texas Education Agency, and local school boards (Texas Education

Agency, 2000). The Texas Education Agency has undertaken an extensive review and revision of the standards for the state. Standards defined by the Texas Education Agency provide a mechanism for measuring student performance and tie student performance on these assessments to school accreditation (Texas State Board of Education, 2000).

Research Design

A mixed method approach was chosen for this case study due to the small sample set and the difficulty realized in studying a connection between the condition of school buildings and student achievement. This study of the Ysleta Independent School District used both qualitative and quantitative methods to examine in-depth the phenomenal success enjoyed by the Ysleta ISD. This district is not only property poor, but the majority of its families are economically disadvantaged. During the 2000–2001 school year, the student population of Ysleta was 46,394. Approximately 88percent, or 40,860, of Ysleta's students are Hispanic, and 34,038 students, or 73.4percent, of its student population is classified as economically disadvantaged.

Across Texas the percent of Hispanics and economically disadvantaged students passing the TAAS sub-tests remains in the seventies. Yet in Ysleta, 83.9percent of the Hispanic students passed all the tests taken and 83.3percent

economically disadvantaged students passed all the TAAS tests taken during 2001. During the eight years covered by this study at the state level, there was a 34.4percent increase in the number of Hispanic students passing all tests taken while Ysleta enjoyed an increase of 39.8percent. Likewise, during the same eight years at the state level, there was a 34.6percent increase in the number of economically disadvantaged students passing all tests taken and noteworthy 41.6percent increase in Ysleta. Obviously something positive is happening in Ysleta.

Due to the variance caused by the research questions in this study, a qualitative approach was used to research the factors that directly affected the decision to include facilities as a component of educational adequacy. This method enabled me to study selected issues in depth in order to "inductively and holistically understand the human experience in context-specific ways" (Patton, 1990, p. 37). Further, it allowed me to study information not available through reports and surveys. Decisions are often determined by intangible factors that are justified through data. This is sometimes referred to as a "gut" feeling. Much of the district's decisions to include facility upgrades and renovations were based on personal bias and learned experience. This mixed method design approach enabled me to investigate relationships between the administrative staff and school board and to extract possible clues as to why their learned experience set them on a

course that would dramatically change the look of their campuses and the level of their students' achievement.

Likewise, a mixed method approach was appropriate for the research question concerning how the availability of funds impacted priorities regarding maintenance, renovation and construction of facilities in Ysleta. A qualitative component allowed me to capture the actual words and thoughts of the decision makers. As Patton (1990) recommends, "direct quotations from people about their experiences, opinions, feelings and knowledge" (p. 10) provided a glimpse into what was special and unique in Ysleta that resulted in a profound difference in TAAS scores. This descriptive detail allowed analysis of shared priorities, biases and experience. Patterns were allowed to emerge "without presupposing in advance what the important dimensions will be" (Patton, 1990, p. 11). It was the ability to "capture" the participants' point of view in their own words that helped connect building condition to gain in student TAAS scores. Lincoln and Guba (1985) describe this method as discovery-oriented. Discovering how a district acquired shared vision regarding their priorities and decisions is important to this study. This study is about how men and women, boys and girls came together as one to attain one goal through a shared vision. That vision included a belief that significantly high numbers of economically disadvantaged students can succeed as measured by the TAAS test and that the conditions of the buildings they attend contribute to that success. Their partnership as one group in a district with a

shared vision and goals enabled me to use a case study model to investigate their success.

Case Study Research

By its nature, a case study allows for multiple approaches to a single environment. My extensive teaching experience has provided me with examples of exceptional student achievement in dilapidated buildings and minimal student achievement in state-of-the-art new buildings. I believed a flaw in the previous studies regarding school facilities was their inability to connect school facilities to a change in student achievement. By narrowing the field of my study, it allowed me to focus on one school district and investigate how this particular set of individuals made their decisions to include facilities in their plan to raise TAAS scores, how the availability of funds impacted their priorities, and, in turn, how they explained their outcomes based on the TAAS test.

The qualitative component of my case study research enabled me to seek a rich understanding of the phenomena enjoyed by the Ysleta ISD as an end in itself, not as an attempt to predict a future outcome (Patton, 1990). It provided a way for me to look inside the schools and gain a perspective of the individuals in the study. This required me to go to Ysleta in order to observe and speak to the participants. It is through their stories that themes as well as personal biases emerged. Yin

(1994) defines a case study as an "empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (1994). The quantitative component allowed me to statistically investigate how much of the variance in TAAS scores could be accounted for by predictor variables. This case study investigates the hows and whys concerning the physical changes in Ysleta's facilities as it seeks new insights into student academic success.

The Role of the Researcher

The role of the researcher for this study was twofold. For the collection of the qualitative data, I relied on good communication skills to gain a rapport and trust with the participants so as to elicit rich, in-depth responses that were context-specific and describe the participants' motivations and ways of knowing. The qualitative method used in this study consisted of three kinds of data collection (Patton, 1990), including "in-depth interviews, examination of primary source documents and direct observation" (p. 10). My role was to attempt to immerse the reader within the setting and provide a "people-oriented inquiry" (Patton, 1990).

"The qualitative interviewer must get close enough to the people and situation…to personally understand in depth what is going on" (Patton, 1990, p. 4). I spent time in the field observing and recording verbal and non-verbal data. To do this, I asked questions before, during and after the data collection to

challenge conclusions and open doors for possibilities. I listened without inflicting bias and then assimilated the information to tell the story. I had to be open to a variety of possibilities, one of which was that the conditions of the buildings had nothing to do with student achievement.

On the other hand, I recorded, analyzed and compared eight years of TAAS data from twenty-nine Ysleta schools. I used the TAAS data to track the progress of the approximate 24,000 students attending the schools in the study. My experience of over 30 years of mathematics teaching assisted in interpreting the scores and making meaning of the statistical findings. To bolster my knowledge set, I attended classes in SPSS software use and accessed regular assistance from statistical experts in the field.

Description and Selection of Participants

The focus of this study was change. This is appropriate because over the eight-year period investigated in this study, students, administrators, teachers and programs changed and so did student scores. Interviewed participants were members of the Ysleta community**.** The participants in this study were the former superintendent of Ysleta, Dr. Anthony Trujillo, the current associate superintendent, Manny Soto, the principals of the twenty-nine Ysleta schools randomly selected for the study, the Ysleta students attending the twenty-nine

schools and the buildings that serve as constant reminders to students that the Ysleta ISD believes that the environment matters.

I used expert opinions provided by the Dana Center Study as well as opinions by members of the educational community at the University of Texas and the Ysleta ISD as reference points in selecting the participants. Dr. Trujillo and Mr. Soto were purposely selected. After a review of the literature, conversations with the Dana Center in Austin, and meetings with the researchers of Urgency, Responsibility, Efficacy: Preliminary Findings of A Study of High-Performing Texas School Districts (Ragland, Asera, & Johnson, 1998), it was obvious that this story could not be told without them.

The Ysleta ISD hired Dr. Trujillo in 1992. At that time, Ysleta ISD was struggling. It was known as one of the lowest performing urban cities in Texas, with no exemplary, one recognized, and forty-eight acceptable campuses. That is a far cry from the Ysleta ISD of 1998 that ranked number one in Texas among large urban districts. Ysleta continues to be one of the highest-ranking urban districts in the state and unlike the Ysleta of 1992, the Ysleta of 2001 boasts nine exemplary, thirty-four recognized, and eight acceptable schools.

The associate superintendent was chosen by the current Ysleta interim superintendent as the appropriate contact concerning student achievement and the history of Ysleta's inclusion of building condition as a possible link to student achievement. In addition to the selection of the past superintendent and current

associate superintendent of Ysleta ISD, various other participants were casually interviewed.

The study took place in four phases. Participants for Phase I were selected through availability sampling during the first visit in January 2002. I went to the schools selected for the study and spoke casually to a variety of people at the sites. The purpose of this data collection was to acquaint me with the schools included in the study and to gather spontaneous impressions of the importance of building conditions from a variety of viewpoints. Phase II consisted of data collection and entry. Phase III occurred in March 2002, and included an interview with the former superintendent of Ysleta ISD. This participant was selected due to his efforts in upgrading the Ysleta school buildings and the role he played in convincing this community that the conditions of schools matter. Phase IV occurred in June 2002 and included an interview with the current associate superintendent of the Ysleta ISD. The associate superintendent for learning standards and assessment reports has served the Ysleta ISD for over thirty years and was the associate superintendent for the district in 1994. This phase also included a visit to collect documents from the district concerning TAAS scores and renovation information.

The participating schools were chosen randomly. There are fifty-two school campuses within the Ysleta ISD. The Ysleta Independent School District believes in site-based leadership, and principals have the opportunity to refuse

participation in any research study. Thirty-three schools were contacted concerning the study. Each principal was sent a letter of introduction and an explanation of the study. Four of the thirty-three schools chose to withdraw participation, resulting in twenty-nine schools or approximately 56percent of the schools in the Ysleta ISD. Four out of seven high schools participated. All eleven middle schools participated, and 14 out of 34 elementary schools participated.

Procedure

The data were collected in four phases. Prior to each visit, telephone conversations and email communications took place with each participant. Following each interview or visit, a thank you note was sent to each participant, addressing their willingness to participate in the study and their contribution. For Phase I, I traveled to Ysleta during January 2002 to gain official permission for the study from the interim superintendent and meet with the Ysleta Research Department. During this visit, I drove to each of the campuses included in the study and took pictures of the buildings. I spoke to randomly selected people at various buildings. There were no set questions, yet all my inquiries centered on how they liked the school and what part they played at the school. My aim was to gain initial impressions of the school environment. I believe the context of the

study is critical in qualitative research and essential as a first introduction to the school district.

Phase II was a six-month data collection period that began in February 2002 and was comprised of two parts. During part one, I collected information about the Ysleta Independent School District. The information was gleaned from the Ysleta ISD Public Education Information Management System (PEIMS) data and the Academic Excellence Indicator System (AEIS) data for the past eight years. The second part of Phase II consisted of inputting eight years of data, for each of the twenty-nine campuses, concerning student achievement of TAAS objectives and other noteworthy information gleaned from the Texas Education Agency's website. During this phase, I attended workshops and tutor sessions on SPSS.

Phase III took place in March and consisted of an interview with the former superintendent, Anthony Trujillo, at his home. The questions were chosen through collaboration with the researcher's committee chairmen. These questions provided an environment of free-flowing discussion and established a connection between the former superintendent and me. The questions pertained to how he had originally included school facilities in his district goals as well as questions pertaining to the conditions of school buildings and how he believed they related to student achievement (Appendix A).

The Phase IV interview with Mr. Manny Soto, the current Associate Superintendent of Learning Standards and Assessment Support took place in June and consisted of similar interview questions. The district chose Mr. Soto for the interview due to his relationship with Mr. Trujillo and his position as Curriculum Director during Mr. Trujillo's years as superintendent.

The Interviews

As suggested by Johnson (1996), the interview protocols followed a non-fixed format. The questions were determined through conversations with my committee chairmen and the natural questions that resulted from the study area. The interviews used a two-step design.

Step one: The participants were interviewed alone for approximately two hours each using specific questions sent to the interviewees prior to the meeting. The interviews were transcribed and examined. Emailing specific clarification questions to the interviewees performed member checks. This communication was followed with telephone conversations in which the transcripts were examined for accuracy and clarity.

Step two: The transcripts for the two interviews revealed emergent themes. The themes were reviewed by a fellow Cooperative Superintendency candidate and further checked for relevancy by my committee chairmen.

Interview Data Analysis

The data collected from the interviews were transcribed immediately following the interview. Each interview transcription was examined and marked for themes. The data were highlighted and coded by hand using the techniques of Miles and Huberman (1994). I checked for specific as well as emergent themes. Further, the field notes were analyzed using the same procedures. Notes were highlighted and coded by hand using sequential analysis techniques (Miles & Huberman, 1994). The interviews and notes were compared to check for similar themes. The themes were framed together to tell the story of Ysleta.

Trustworthiness and Credibility of Interviews

Finding a possible relationship between school building conditions and student achievement is difficult at best. For that reason, trustworthiness and credibility of the data is essential. Lincoln and Guba's (1985) work on qualitative research stresses the use of methodologies that establish trustworthiness through a variety of methods. They define trustworthiness as answering the question of "How we can increase our and our reader's confidence in what we've found" (p.263). Likewise, Miles and Huberman (1994) stress that the inquirer must persuade his or her audience that the findings are worth paying attention. The researcher used Glesne's identifying procedures for qualitative research (Glesne,

1999). These procedures included but were not limited to: prolonged engagement, peer review and debriefing, member checks, thick description and triangulation.

Prolonged engagement was established by initiating conversation with the former superintendent and associate superintendent in January and corresponding with them through email, mailings and phone conversations in addition to the actual on-site interviews. To avoid bias caused by my "non-continuous presence" (Miles & Huberman, 1994, p.264), I systematically maintained a relationship with the participants throughout the study.

Peer review and debriefing was accomplished through interaction with the researcher's Cooperative Superintendency cohort. I met with a cohort and reviewed the transcriptions and coding prior to and after analyzing the data for themes.

"The sharing of interview transcripts, analytical thoughts, and drafts of the final report established member checks with the research participant to make sure the researcher is representing the ideas accurately" (Glesne, 1999, p.32). Ongoing communication with the participants as well as a review of the transcripts and drafts of the actual paper by the participant provided member checks for accuracy.

The participant provided detailed description and thick context through questions that solicited detailed answers and thought-provoking reflection. This provided me a window into the research context (Glesne, 1999). Schools for the study were chosen randomly by placing all the Ysleta school names in a box and

drawing twenty school names; of these seventeen chose to participate in the study (Miles & Huberman, 1994, p. 264). Drawing thirteen more schools out of the box, of which twelve chose to participate, completed the study group. This random selection increased reputational sampling and trustworthiness of the data.

My reflexive journal provided an ongoing documentation of experiences, appointments, feelings, conversations and responses to problems and triumphs experienced during the study. Questions stressed by Miles and Huberman (1994) were used by the researcher to conduct an ongoing, internal conversation to avoid researcher bias.

Finally, triangulation was established through multiple data-collection methods (Glesne, 1999). These included interviews and conversations with a variety of individuals, written and electronic documents concerning El Paso and the Ysleta district, and direct observation of the buildings and people (Miles & Huberman, 1994).

Data Collection and Instrumentation

Data related to building and classroom conditions, student achievement, the socio-economic status of the schools, demographics of the schools, schedules of renovation and construction, criteria used to determine priorities regarding district capital expenditures and financial information concerning availability of funds was

needed for this study. The data on district priorities, sources for funds, and building and classroom conditions were collected using a variety of techniques one of which was a survey based in part on work conducted by Cash (1993), Hines (1996), Lanham (1999) in Virginia, and Earthman, Cash and Berkum (1995) in North Dakota called the *Commonwealth Assessment of Physical Environment* (CAPE). In Cash's original study, several facility assessment survey instruments were reviewed. Cash developed a survey using various factors described in previous studies and also included space for written responses to each question. The survey was field tested by Virginia Beach City Public Schools research department in order to determine reliability. Cash checked inter-rater reliability by fielding the survey at several additional high schools and obtained similar ratings. The assessment placed schools in condition level categories of substandard, standard, and above standard. A similar approach was used to test inter-rater reliability of the questionnaire used for this study.

Demographic information collected for this study came from the Texas Education Agency's (TEA) demographic data collected in 2001. The percentage of students classified as economically disadvantaged came from data supplied by TEA. Data for student achievement were gleaned from the Texas Education Agency's 1994 - 2001 administration of the Texas Assessment of Academic Skills (TAAS) test.

Survey Administration

Procedures defined and articulated by Dillman (1978) were used to administer the survey instruments. Cover letters were developed to accompany each of the survey documents. (Appendix B) The cover letter stated the purpose of the surveys, their individual place in this study, why it was important and why individuals surveyed should respond. Respondent confidentiality was assured. Surveys were mailed in a pre-addressed stamped return envelope. Participants had the choice to sign the actual survey or leave it blank. A postcard was mailed one week after the initial mailing thanking participants responding to the questionnaire and reminding those not responding to do so. A follow-up mailing was sent to non-respondents three weeks after the initial mailing. Another letter and survey was included asking for the assistance of the respondent in completing the survey. A final mailing was sent to all non-respondents the seventh week after the initial mailing making a final request of the participants and included a third copy of the survey.

Response Rate

Ysleta Independent School District was selected for this study, and surveys were sent to randomly selected building principals within this district. A total of twenty-nine schools within the district were investigated.

Scoring

Survey items were constructed to obtain either specific numerical answers generated by the respondent or a selection from a list of responses. These numerical responses were analyzed using the Statistical Package for the Social Sciences (SPSS). The surveys concluded with open-ended questions. The responses to these questions were analyzed thematically. A copy of the survey is displayed in Appendix C.

Reliability and Validity

The survey items were taken from two survey instruments used and field tested in prior research. The Commonwealth Assessment of Physical Environment was initially developed and administered by Cash in 1993 and Hines in 1996, by Earthman, Cash and Berkum in 1995 with minor alterations, and finally by Lanham in 1999. The University of Texas in conjunction with the Texas Education Agency administered the Estes Survey in 1999.

The Facility Questionnaire was pre-tested to ascertain if the individual questions measured what they were intended to measure; whether they were written clearly, to what extent each reader had the same interpretation of the question, whether appropriate answer choices were provided; whether the overall impression made by the survey was positive; and whether any researcher bias was evidenced in the survey. A second content review was conducted using 15 selected principals in various Texas districts. Adjustments were made following analysis.

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Texas Assessment of Academic Skills

The Texas Assessment of Academic Skills is routinely administered to all third, fifth, eighth, and tenth grade students. The Texas Education Agency collects, compiles and releases data for each individual school as well as the district. The third, fifth, and tenth grade results and the 1994-2001 TAAS reports for each participating school within Ysleta were reviewed for this study.

Data Analysis

There were several forms of data used in this research. It was important for this project that the data was used to tell the story of Ysleta with an emphasis on decisions concerning school facilities and their impact on student achievement.

For this study, the qualitative and quantitative data analysis does not stand alone but commingled to provide a basis for the findings. Of equal importance are data concerning why people made decisions and how well percentages of passing TAAS scores hover around a best-fit line. Extensive time and effort was used in analyzing the qualitative data. Interviews were transcribed and analyzed. Themes were determined and checked by participants and colleagues. The quantitative data required the same attention to detail.

To determine the extent to which school facilities influence student achievement, an achievement instrument had to be chosen that was valid and reliable. The Texas Assessment of Academic Skills has been used by the Texas public schools since 1994, and was also used by the Dana Center in previous noteworthy research. It served as the achievement benchmark for this study.

Multiple regression procedures are widely used in social and natural science research. It allows the researcher to mathematically investigate the best predictor of an event. The Statistical Program for the Social Science (SPSS, 2001) was used to conduct descriptive statistics (means, standard deviations, frequencies, and percentages) and multiple regression analysis. Backward multiple regression analysis determined how much of the variance in the TAAS scores (the criterion) was accounted for by the predictor variables (building age, financial disadvantage of the students, etc.). The use of multiple regressions and a seemingly unrelated regression (SUR) provided a window of observation into the reasons student

achievement might change, and indicated the probability that school facilities played a part.

Limitations of the Study

This is a case study of the Ysleta Independent School District and its victory in raising TAAS scores. This study did not attempt to investigate the condition of schools and their relationship to student achievement at the macro level, and it is not meant to be generalized. Further, there are several methodological weaknesses. The study investigated achievement and building conditions over an eight-year period for twenty-nine schools in the Ysleta ISD. While the study used over one-half of the Ysleta schools, the sampling is comparatively small. A larger sampling could result in a more complete study.

The use of a survey provided principals with an instrument to describe their school yet the study is limited by the questions provided by the survey and the truthfulness and attention to detail used by each principal in answering it. The study is further limited by the extent to which information could be obtained concerning specific renovation, repairs and construction projects from the district.

Summary

The purpose of this study was to investigate the relationship between student achievement and the condition of school facilities in the Ysleta Independent School District. Chapter III described the research methodology used for this study. The use of a mixed method case study approach provided a more detailed, yet statistically analyzed description of the successful attempt by the Ysleta Independent School District to both improve student achievement and upgrade their school facilities. As defined by a case study, this approach allowed for a focus on one district and, therefore, does not lend itself to generalization. Chapter III described the setting, the research design, the selection of the participants, procedures of interviews and survey administration, data collection, the scoring of the survey and the data analysis.

Chapter IV reports the contents of the study concerning the effect school facilities have on student achievement. Chapter V will describe the results and address this study's contribution to the ongoing discussion and literature concerning school facilities and student achievement, as well as discuss the findings, conclusions and recommendations of this study.

CHAPTER IV

FINDINGS OF THE STUDY

Although Shirley Hansen's statistics in Schoolhouse in the Red. A Guide for Cutting Our Losses: Powerful Recommendations For Improving America's School Facilities may be somewhat outdated, her survey through the American Association of School Administrators showed that the condition of school facilities in the United States is rapidly failing. In her 1991 study, she found that 74percent of America's school facilities should be replaced or repaired and as much as 12percent failed to meet minimum building standards. Further, she found that the consequences of deferred maintenance range from premature building deterioration, increased repair costs and needs, increased replacement costs and reduced operating efficiency of equipment to lower efficiency of school personnel and possible links to student achievement. The price tag for deferred maintenance quadrupled over the eight years preceding her study, from $25 billion in 1983 to $100 billion in 1991 and the environment of peeling paint, crumbling plaster, nonfunctioning toilets, poor lighting, inadequate ventilation, and inoperative heating and cooling systems can adversely affect people working within the school's environment (Hansen, 1992). An earlier study by the Carnegie Foundation for the Advancement of Teaching found that schools are under-funded, facilities are decaying, and faculty and student morale is low (Carnegie Foundation

for the Advancement of Teaching, 1988). John Sharp, former Comptroller of Texas Public Accounts, produced a publication in 1998 titled *Current and Future Facilities: Needs of Texas Public School Districts.* For it, he surveyed Texas' 1,037 superintendents concerning the status of their facilities, problems with facilities and their projected needs for facilities. This survey did not focus on individual districts but aggregated data for the entire state. His report represents 614 district respondents, of which 88.9 percent represent districts with an enrollment of more than 50,000 students. Together they identified approximately $9 billion in anticipated facility needs for Texas schools.

A relationship between the condition of school facilities and student achievement, while assumed, is difficult to assess and lacks rigorous study. This chapter contains a presentation of the information and data findings for this study with regard to the Ysleta Independent School District and its decision in 1994 to include school facilities as a component of its student achievement initiative. This study used a mixed method approach. A discussion of the interviews with Mr. Trujillo and Mr. Soto along with the findings from the survey of school principals is reported. The interview and survey findings are based upon the following research questions,

1. What factors directly affect the decision to include facilities as a component of educational adequacy?

2. How does availability of funds impact priorities regarding maintenance, renovation, and construction of facilities?
3. To what extent can student achievement on the TAAS test be explained by socio-economic condition, school size, building age, cleanliness, maintenance, and the condition of the school's structure?

The Interviews

Interviews were conducted for this study and the quoted material in this chapter resulted from these interviews, unless otherwise referenced. The results of the interviews are acknowledged through the identification of major and sub-themes that interweave throughout the interviews. The study of the effect school facility conditions has on student achievement found definition through the major themes of risky decisions, powerful people, buildings matter and accountability. *Risky decisions* are defined by those pivotal decisions made by key individuals and members of the school family that were bold, connected to the mission of the school, were visionary, contributed to the district's need for change and contained a high possibility of failure. *Powerful people* refers to those people within and outside the school community who wield power and used their power to broker resistance or initiate new ideas. *Buildings matter* refers to an intrinsic feeling and decision by individuals and groups that the conditions of school facilities make a

difference to teacher and student morale, to the efficiency of the campus and its occupants and ultimately to the achievement of the district's students. The final theme of *accountability* refers to a commitment by the Ysleta ISD and the school community to standards, a consistent adherence to expectations of excellence and a systematic approach to ensure compliance.

Interwoven into each of the four major themes of risky decisions, powerful people, buildings matter, and accountability were a series of sub-themes of determination, symbolic trust, economic value, politics and pride. The sub-theme of *determination* refers to commitment and courage as evidenced throughout the themes of risky decisions, powerful people, buildings matter and accountability. The sub-theme of *symbolic trust* refers to the trust that was established and pervaded the Ysleta community and intertwined throughout the major themes. *Economic value* refers to the value that members of the community placed on themselves and on their schools. It was evidenced through their decisions, their leaders, their buildings and their accountability. *Politics* refers to the level of negotiating and bartering that took place as this fine district set its course toward academic excellence. And, finally, *pride* refers to the individual and collective pride the members of the Ysleta Independent School District feel both for their district and for their culture. That pride sustains their commitment to students and to leaving no brick unturned and no student behind.

Context

The Ysleta Independent School District serves a student population of approximately 46,400. The average age of its schools is 50 years old and one-third are over 75 years old. Ysleta is comprised of a large minority population as well as a population characterized by poverty. Its ethnic distribution is 40,860 Hispanic students, 3,975 White students, 1,099 African American, 262 Native American students and 198 Asian American students. There are 34,038 economically disadvantaged students, as defined by the Texas Education Agency, and the district is currently rated as Recognized by TEA. In 1994, the Ysleta Independent School District was given a rating of Academically Acceptable. At that time only 34.5percent of the tested economically disadvantaged students in grade ten and the tested economically disadvantaged students in grades three through eight passed the reading portion of the TAAS test. Likewise, only 31.6percent passed the writing test, and 22percent passed the math test. In 1994, the leaders of the Ysleta ISD set out to make a difference, and, indeed, they have. As of 2001, economically disadvantaged students are passing the TAAS test at a rate of 88.1percent for reading, 89.2percent for writing and 93.6percent for mathematics.

Risky Decisions

Antonio Trujillo joined the Ysleta ISD in the spring of 1994. In an interview, Mr. Trujillo, "One of the places we started was the buildings." He asked for permission to spend a few months just to get to know the people in Ysleta. One of his first risky decisions was to save Ysleta High School. It was the original high school and was also where the district offices had been. The district was built around that high school, yet by 1994 it was in very bad shape. The Texas Education Agency said that the district needed to tear it down and start over. Mr. Trujillo describes the early days of his superintendency.

> I told the board that I would like to spend about two months just really acclimating myself and getting people acclimated to me. So I went to every school. I went to every school and I talked to the faculty at every school. And one of the things that was amazing to me was the numbers, the number of people that had graduated from Ysleta High School that were teachers in our district. And the more I got acclimated to the district the more I got acquainted with them, the more I realized that the school had graduated a tremendous number of people that were now in leadership positions throughout the community an everything else and that to tear the school down

would be to tear something down that was very precious to them and it was very symbolic.

Determination

Trujillo encountered numerous roadblocks. One of them appeared early in his superintendency. He describes it this way, "When I came to the district I found a large bureaucracy, if you will, or large overhead in the construction office. One of my theories was that the money could be eaten up by overhead and that you needed to put the money to work, the construction money to work." The construction group had lost credibility with the Board. Trujillo arranged for the director of the construction area to leave the district. After the director left the district, Trujillo laid off the rest of the department. Trujillo was new to the district, and he had no bond issue at the time. Trujillo explained, "There had been some alienation between the community, the board and the district over the previous bond issue because they had built some very inadequate buildings." Since there was a history of animosity between the community and the district about construction, Trujillo decided to move in a new and daring direction. Trujillo discussed with the chairman of the Board "the notion that we ought to go on a pay as you go program." He felt that he could use the Texas finance system to the district's advantage. Trujillo and the Board raised local school tax by eight cents. Due to Ysleta's poor wealth designation, the state awarded funds two to one.

Ysleta had netted the district approximately $3.25 million. The state then awarded the district between $6-7 million dollars. With $10 million in the bank for renovation and construction, Trujillo and the Board set out to rebuild the district.

Symbolic Trust

While walking around Ysleta High School, Trujillo ran into two men who were doing some maintenance work to try to keep the place together. Mr. Trujillo said,

> One of them said to me, "We could fix this school up for you Mr. Trujillo if you give us the money." I said, "What do you think it will take?" And this one fellow spoke up and said he could redo the whole school for $2 million. So I said to myself, "$2 million to preserve the school is nothing."

The district is divided by highway Interstate 10. Trujillo described the separation to the researcher as the middle class of the district was north of I10 and the lower income class was south of I10. He indicated that the buildings reflected the economic conditions of the community. The district's growth was on the East side, or north of the freeway, and, therefore, had newer schools. Trujillo said, "The interesting issue was that the needs of both sides of the freeway were different and extensive because on the North side there was crowding. We have

kind of a freeway migration, as people become more capable they will leave the South, the lower valley and move to the North side." Since the district is predominately Hispanic, he continued, "It is a class issue."

Trujillo wanted to show the district that they could change the schools and thereby change student achievement by using their own manpower. Trujillo explained, "I took the man that was working at this little high school and said he could redo the building for two million dollars. He was a graduate and an architect. He had done his architectural studies in Mexico. He had not had an opportunity to show his creativity. He was a rebel." Trujillo made his first major risky decision while talking to the young man. In describing his meeting, Trujillo said, "I don't know you, but I'm going to give it a shot, and in the first summer I said I want you to renovate this high school. Well, I couldn't believe what he did."

Trujillo began to systematically change the district. He was concerned about he lack of trust throughout the district, and he felt the district and the community of teachers and students needed something concrete that represented trust in their abilities and faith in their future. He explained:

> I think our beginning was the construction program. It was symbolic. It was something you could touch and feel and see. There were so many things to be proved by it, that simple people

had talents that we could use them, if you gave them the right tools and encouragement.

Economic Value

Following the Edgewood case, the Supreme Court ordered Texas to establish a more equitable finance system. Eventually, Texas established a system that for all practical purposes required the district to raise local property taxes. Trujillo said, "The state would match the money raised based on the wealth of the district. In our district it was a two to one match. So we would get two dollars from the state for every dollar that we raised over property taxes." Trujillo took a risk by using the system to fund his construction projects. He also formed an in-house construction company. This decision is practically unheard of in public schools, and the in-house construction company was extremely successful. The district was able to renovate for a fraction of the cost.

Mr. Manny Soto agreed with Mr. Trujillo. Soto said, "There are three legs to this stool. The facility issue is one of the legs and the other one was simultaneously the $10 million for the construction program. The third leg of the stool is the psychology of the workforce." Mr. Soto emphasized that the district was able to get more "bang for the buck" by using in-house maintenance workers as the construction crew. An extra benefit was that the members of the

maintenance crew were equipped with the best tools money could buy. The men worked extra hours to complete renovation projects well under the target dates. This saved the district money, yet the overtime increased the workers' salaries. As the maintenance workers socioeconomic status improved, so did their commitment to excellence.

Trujillo was determined that the students of Ysleta, regardless of their circumstances, would graduate, speak Spanish and pass the TAAS test. Trujillo explained that one of the first conflicts he was presented with was "one hundred fifty students that had been expelled from the district during that school year. This was in March. How can you throw one hundred fifty kids out of school? We built the first alternative school in the history of Texas." Following a visit by some State senators and representatives, Texas mandated alternative schools for every district in the state.

Politics

As with most large systems, Ysleta is not immune to political ups and downs. Trujillo explained, "If you are a great teacher, what is your reward? You get more kids." The chairman of the Board was a member of an organization called Angry Taxpayers Association. Trujillo said, "He was quite a conservative gentleman, and he wielded considerable power with the conservative element of El Paso." The Board member had an idea about a pay as you go construction

program and Trujillo liked it. It was important to both men that the district "not lay the bills on future populations." They made a risky decision to raise taxes. The chairman of the Board was elected based on a campaign of no new taxes. Now they were raising taxes in order to net a possible $3-3.25 million. Trujillo was saying that teachers and students matter and their surrounding make a difference. It did not sit well with everyone. The measure worked but there was some eventual political fall out from the decision.

Pride

Before Trujillo came to Ysleta, the district had a difficult time recruiting teachers and non-teaching personnel. It really was not because the pay was substantially lower than other large towns. Unless you are from the area, El Paso is far from home. The news concerning Trujillo's dedication to worker input and risky strategies began to spread. Trujillo explained, "We proved that dedication, commitment and intelligence were the major things we were looking for in people. We were giving people a purpose for their lives."

The decisions concerning people and buildings began to build pride within the community. Trujillo proudly stated that maintenance men were finished "going out with screwdrivers and hammers to try to keep the place together." Trujillo explained that finally the district acknowledged "it was a waste of their

knowledge, their time and our resources. These men were talented they just lacked confidence. Well, the place just exploded with creativity."

Powerful People

Determination

Few would argue that Anthony Trujillo is a very powerful person. Through his leadership and personal style, Ysleta was the first and largest urban school district to receive a recognized rating by the state of Texas. He was a hard worker, and he expected the same from his employees. Early in his tenure at Ysleta, he let district personnel know he meant business by getting their attention. He placed a new principal at a historically struggling school. Trujillo said that around Christmas,

> The principal came to me and said that "It's impossible, this school is impossible." So I called the entire staff together right after the holidays and said, "You are all fired. This school is finished and we're starting over." Every school called a faculty meeting the next day and said, "This guy is nuts, folks. We're not going to be the next one so let's get to work."

Trujillo's belief in excellence and the ability of children to achieve it was underscored by his determination to make it happen. Unfortunately a member of

the school board for the status quo met his resolve for transformation with an equal resolve. This particular board member complained about the "frills" Mr. Trujillo was adding to the district. Trujillo said:

> She used clichés like, I want meat and potatoes. I don't want all these frills. That appeals to the public. That appeals to the press. But the truth was… when you look to buy a house, what do you look at? Why should children have any less when they go to school and they spend six to eight hours of the day? She came off as a big teacher advocate. So, that was a running, you know, kind of battle between myself and her about the quality of schools.

Trujillo had also tampered with the local construction industry, and they were not going to go down without a fight. While Trujillo's outspoken manner and gutsy persona provided the kind of leadership necessary to move his district quickly forward, it gave his opponents a hole in the dike. Trujillo explained:

> Architects were upset with me. They called me to a meeting. It was a very hostile meeting. And basically I took the position, I said, "I'm not here for your benefit. I came here to do some things with these children, for this community, and if you can't make a living because the district is not putting a lot of money to you, then that's too bad."

Although it would seem reasonable for the community to rally behind Trujillo's attempt to save money, he misread the construction industry's ability to use it against him, and while the district continued to set new standards for facility excellence, his personal superintendency began to crack.

Symbolic Trust

Trujillo was an "old school" administrator. He understood educators, and he knew how to get the most from them. He called a meeting with principals and district level administrator and said, "This is the most unusual district I've ever been in. It has the brightest adults in the world and the dumbest kids." The district was ranked at the bottom of the big eight school districts in Texas. Trujillo went on to say, "I looked at your personnel jackets and all of you exceed expectations. Now tell me how you can have fantastic adults not making any progress with children unless those children are stupid." He got his message across.

Trujillo used the same approach with construction. Trujillo said he felt he had the "perfect guy who understood the workers, understood their culture and how to get the most out of them. He was able to give them leeway, use their talents without dictating everything, while overseeing everything." Trujillo led his district by example. He was a powerful person and passionate about his work. He trusted his employees, and it was infectious.

Economic Value

Trujillo was the new man in town. He was making huge changes in the district, and change is difficult, especially when it involves a local industry's income. Local contractors were furious with Trujillo. He was using his own maintenance crews for renovation projects, and he was seen as an outsider. The construction industry began slowly to rise up against him. Trujillo explained:

> It was not pleasant. It was not a great relationship that I had with the contracting and building industry.…They funded the campaigns of several board members with the promise that they would get me out of here. That they could not do business in this district as long as I was here. I was not going to take any payoffs. There was tremendous corruption.

Trujillo was committed to saving money. He explained that instead of working with local contractors to meet a compromise, "I made a decision based on what I think is good for the children and that's the end of it." Unfortunately, it was the beginning of the end for Trujillo.

Politics

The needs of the district were diverse. On the North side of town there was over crowding and on the South side of town there was poverty. It was a class

issue. It was economic. The board met and they were, ironically enough, associated somewhat with construction. One member was a civil engineer. Another was an electrical engineer. Still another worked for an engineering firm. There was an insurance salesman and a real estate agent. Trujillo said, "I had this group of men who had ideas about buildings." The majority of the board believed that the physical condition of their school facilities made a difference in the quality of their schools. They were determined to upgrade the facilities. One member of the board did not agree. She was very vocal and Trujillo believes she worked earnestly to sway teachers and the building industry against him and his plans.

Little by little, the original maintenance supervisors left the district. Trujillo explained, "They no longer had these folks under their thumb and that's what they were treating them like. They were treating them like indentured servants more than skilled workers." El Paso's isolation in Texas worked against Trujillo. The maintenance supervisors left the district, but they did not leave the town. The movement against Trujillo was a slow growing cancer but a cancer nonetheless.

Pride

Most of the current employees interviewed by the researcher described the years while Trujillo was superintendent as the Camelot years. Manny Soto said, "We were able to get more performance during the mid-nineties from the various

categories of employees, because we gave them more respect. We all listened to them in terms of what tools they needed to do a better job." Trujillo spent a million dollars on power tools for the maintenance department his first year with the district. His administrators wrote grants for technology, and he began to systematically supply the district with the latest technology. Ysleta High School had graduated a tremendous number of people that held leadership positions throughout the community. Slowly many of these leaders joined the Ysleta ISD, and there was a sense of pride about being associated with Ysleta ISD.

Trujillo said, "The first school building we renovated was located in the poorest part of town. As the building was transformed back to its heyday, the local community was energized." An out of town construction company was not slapping up a new building. The community's fathers, brothers and sons were doing the reconstruction. They were bringing back the building that was once the pride of the district. Ysleta High School was scheduled for demolition in 1994. Today it looks like a prestigious private school and is designated as recognized by the Texas Education Agency.

Buildings Matter

Determination

Trujillo was determined that the students of Ysleta ISD would have the finest schools he could provide. He said, "My theory is that the environment surrounding people has a great deal to do with their attitudes about everything." He was a master at working with the soul of his employees. Trujillo explained, "They were giving it their finest. So there was a lot of caring that went on about the facility program all of the sudden. The whole district began to change because of the facilities." Trujillo believes that the shareholders of the Ysleta ISD had the ability but needed a physical sign to rally around. He said:

> It was a physical demonstration to people in the community that they need not settle for second-class anything. And that if we are going to have great buildings, we are going to have a great education inside those buildings. So it was very clear to the teachers and principals. I demanded that people perform at high levels. So this transferred, when they saw this happening to the buildings, they knew we meant business

Trujillo had a plan in his head. It was a plan for student achievement and personal pride. He said, "All of this started with the construction, but it was leading, it was part of a larger picture. It was part of the final analysis of getting

kids to better achievement. We became the first recognized school district of the urban districts in Texas."

Trujillo's resolve was bolstered by the resolve of his top employees. Manny Soto directed the instructional program for the district. While his reasons for believing in the benefit of proper maintenance, renovation and construction differed from that of Trujillo, he was nonetheless determined. Mr. Soto said:

> We have got to be in the pocket. We don't have time for principals to be worrying about getting drinking fountains, air conditioner, or a leaky roof being fixed. If I am talking to a principal about construction, he's not in the pocket. He's not focused. So you have to remove all those issues in order to get instructional leaders back to where they need to be, talking about teaching and learning. Talking about teachers and instruction instead of spending time on drinking fountains.

Mr. Soto has beliefs about educational leaders and their duties to that position. Soto said, "Your job is to prepare children to go to college. It's in our mission statement. That's everybody's job. You keep a clean, safe facility at your school as your part of this equation." He also feels strongly about barriers to quality education and leadership. He said, "Having a good facility is a good

support element to nurture the instructional process. When you don't have it, then it (facilities) becomes a barrier."

Symbolic Trust

Trujillo decided to renovate the buildings the first day he was walking around a school slated for demolition. He said:

> The first place that was probably more symbolic than anyplace else was Ysleta High School. This is the school where the district started. It was in very bad shape. The state had said we must tear it down and start over. To tear down the school would be to tear down something that was very precious to them. It was very symbolic.

Trujillo believes there were certain areas of personal pride that transcended socioeconomic status. He felt he needed to build trust within the school community by providing a visible sign regarding that understanding and respect. Trujillo said, "When you go buy a new home, if the exterior of the home isn't appealing to you, you aren't even going to walk into it. You aren't going to venture inside." Likewise, Trujillo believes that students, parents and teachers needed a visible sign of assurance concerning his attention to detail and his commitment to excellence. Trujillo continued:

> If the grounds are not manicured, if there is graffiti on the building, that's not going to be inviting, not only to the children but to the parents as well. There was a clear effort to refresh all the schools so that we could engage the parent so that they would have something appealing to come into at everyone of our campuses.

Economic Value

Trujillo used the ability of middle class and poor families to stretch a dollar to his advantage. He was very vocal about the money he was saving the district by using their own school personnel for renovation projects. Trujillo said, "Our schools were not just well built, they were beautiful, gorgeous schools. We were building them for about half the cost of anybody else. The other school districts were running initially about $100 a square foot. We never got close to $100 a square foot. We were running about $50 a square foot. Eventually we got up to about $75, but they were going over $125." He began to build a "we can do it" attitude among his constituents. By providing schools that looked like the schools affluent families choose, parents could believe their children had the possibility of competing successfully in that arena and eventually break through the cycle of poverty that had somehow snared them.

Politics

It is evident that the Ysleta ISD has made substantial progress concerning the condition of their school facilities, but can they compete with wealthy districts? Mr. Soto believes the barrier is that the Facility Allotment Fund can only be used for instructional facilities. Soto explained,

> We cannot build anything unless it has something to do with instruction. I can't pay for bleachers in a gym. Unless I build a new school, I can't build a cafeteria because it is not instructional facility. If it is the content of a total school, then I can build a cafeteria facility because it is an element of the total school. It ties my hands to use state funds.

The state has moved in the right direction by providing funds for property poor districts, but Soto believes "we need facility standards." Trying to avoid a bitter tone when discussing the five-story parking garage in Highland Park, Mr. Soto said,:

> I have to marvel at having those advantages at their school. I can hope that someday to have some of those advantages. We need to be able to do whatever we want in terms of what we need for a facility. It should be our decision. It shouldn't be managed in Austin. Let Austin hold us accountable with the outcome, that's

fine. Establish standards and hold us accountable but give us all the discretion we would have if we lived in Alamo Heights.

One of the problems districts like Ysleta have is that facility needs transcend the narrow definition of instructional set by the state. Many of the students in Ysleta need more than a decent education to attend college. They need scholarships. Some of these scholarships are in the form of academic grants and fellowships, but many can be found through sports and extracurricular activities. Since the Facility Allotment Fund definition of instruction is narrowly set, the students in districts like Ysleta often miss out on opportunities because of the lack of equity afforded by lack of funding. Soto explained:

> We have two soccer teams that advanced above our area here. They went from bi- district, then regional games, and then they were in the area playoffs for the State 5A tournament. They played in Coppell. Both our high schools lost one to nothing. The difference was it was the first time that our kids had ever played on Astroturf. The question is – Should the state tell us not to spend our money on Astroturf when our kids need to go and compete against kids that have it and knowing that on that level of competition, college scholarships are derived from success in those kinds of competitions. Where is the equity in that? When we talk about

> access and equity issues for children across Texas, you are talking about facilities.

Pride

Trujillo explained that when he started his renovation plan "some of the bathrooms, the stench was unbelievable and the cafeterias, totally inadequate. They were unsafe, basically. They were unsafe. The libraries were a joke. There were a couple of classrooms with the wall knocked out between them and nothing there at all." Placed in the hands of people that cared. The workers began to breath life into the buildings again. Trujillo explained:

> The workers set up an assembly line and actually crafted brand new window frames, unbelievable, that matched these 40-year-old window frames and they redid the windowpanes. In the 30s and 40s they were artisans in many ways. They weren't just slapping up buildings. They were artisans. We had been paying these people and getting nothing. Now we are getting tremendous productivity out of them. So, anyway, that was the breakthrough.

> The old libraries that in 1994 were just a couple of classrooms slapped together became a wonderland for children. The guy found

a sailboat. He built the library around it. The children go into the sailboat for their reading. He did the same thing with a fire engine. It's gorgeous. They are beautiful. He built not just schools, but beautiful schools.

One of Trujillo's theories was that greed and envy were terrific motivators. He would take the principals around the district in busses and show them the new construction. Trujillo said, "So I would take them to these wonderful construction projects. They would see these and say, "I want that."

Accountability

Determination

Trujillo believes in accountability. They conducted a survey and made lists of their needs. Trujillo explained, "We gained credibility about a couple of things--number one, excellence. It wasn't just good enough to have a standard building. That building needed to have a tremendous amount of beauty and functionality. It had to be comfortable and conducive to learning. Secondly, we had to accomplish our task." He was determined to set high standards in every area and to assure his constituents that each and every child deserved the best. He said, "We were not going to stand for the have and the have-not kind of system. We were doing away with the have and the have not."

Symbolic Trust

There had been problems in the district with construction before Trujillo joined Ysleta. As a result, there was a very low trust level between taxpayers and the district. Trujillo felt certain that a bond election would not pass. Instead, he and the chairman of the Board devised the pay as you go plan. There was also a lack of trust by the employees of the school. Their work was not respected and their opinion was seldom requested. All this changed with Trujillo's arrival. Soto said,

> The third leg of the stool is the psychology of the workforce. We have to give them the same discretion as the wealthy districts. I hold them accountable to performance standards but I don't tie their hands. You have to make sure that you are building a system that nurtures leadership at all levels. That means they should be able to make the same kind of building decisions as the leaders in Alamo Heights or Highland Park.

Economic Value

For all his wheeling and dealing, Trujillo was a man that knew how to get value for his district's money. Trujillo explained:

> We had one school that was going to be gutted and redone and I think the budget for it was $2 million and it came in at about $3.5 million. I called the architect and said, "You knew what the budget was, you're the professional, you will redesign this school and get it under budget." And he did at his own expense.

He was also careful not to fall into the trap of less than desirable work all in the name of the lowest bid. Trujillo explained:

> There is a problem with low bid versus best value or total cost of ownership. You know, what it's going to cost me ten or fifteen years out in maintenance. We can't always take the approach of which is total cost of ownership less value which may cost you more money up front. You need to be doing the risk benefit analysis of both to determine that.

Trujillo knew how to get the best value for the dollar. He managed to keep the district's costs well under what the state was willing to pay, and by keeping his costs down, he was able to pay his employees more.

Politics

It is impossible to discuss Ysleta's building program without noting, as Trujillo puts it, "the running battle and hostility between architects and the

contractors of this town because we were doing so much of it ourselves and because we were requiring real accountability." For whatever reason, Trujillo was unable to meet local contractors halfway and they likewise refused. In the end, this battle dismantled the superintendent.

Today Ysleta continues to complain about equity and access issues. Because Ysleta is a property poor district it must rely on the state for the majority of their funding. Since the state's money comes with barriers, Ysleta is unable to accomplish all the district feels it needs and it points to other more wealthy districts. Trujillo said:

> They have more flexibility in terms of what protocol they have to meet because they can do it totally on their own revenue stream. So whatever protocol of fiduciary responsibility is totally up to them after they meet the minimum issuance of bonds or if they are going to use the money on a community vote approach. They really have lots of latitude.

Ysleta on the other hand, must follow narrowly defined definitions of instruction and need. The district believes this difference is at the heart of the state's funding inequity.

Pride

Ysleta is a very proud district. They have maintained their dedication to accountability and yet are still site base managed. Soto said, "We have a 24-hour rule for graffiti. If it goes up, in 24 hours it is off." Trujillo's style of leadership has contributed to their success. By allowing administrators, teachers and students to be decision makers, they continue without him. To their credit, academic success is just as important in 2001 as it was during Trujillo's superintendency.

Survey and TAAS Results

The Survey

Thirty-three surveys were sent to a random sampling of high schools, middle schools and elementary schools in the Ysleta Independent School District. Twenty-nine of the 33 principals returned them. The survey consisted of 44 questions. The first question solicited information concerning the population of the school's neighborhood. The principals were asked to check all the categories that applied. Questions 2-17 consisted of inquiries concerning the structure of the school. Questions 18-28 pertained to school maintenance and questions 29-38 concerned housekeeping. Question 39 asked the respondent to indicate whether the shareholders in the school generally believe that the conditions and availability of educational facilities can affect the level of academic performance. Question 40

asked the principals to rank the current conditions and availability of educational facilities. Questions 41-42 requested specific square footage and acreage information. Question 43 asked the principal to comment on a possible relationship between the building's condition and student achievement, and question 44 asked for any further information the principal wanted to share with the researcher regarding the school's physical environment.

Survey Responses

Ysleta uses a model of site-based management in which principals are the chief decision makers on each campus. For this study, the principals were asked to respond to each question based on their own professional opinion as the building's chief administrator. Their responses are summarized in the following three sections.

Section I:

Questions Related to Demographics and School Structure

Demographics

Twenty Ysleta ISD schools were sent a survey. Of those who responded, approximately 17 percent of the neighborhoods for which the student populations are drawn contain a significant portion of older families without children

(Senior/Empty Nest), are highly mobile families or are middle class families. Twenty-four percent of the neighborhoods contained single families or families living in suburban communities. A significant portion or about 31 percent of the neighborhoods contains a population that mimics the diversity within the city (normal mix) or is multi-family homes. About 21 percent of the neighborhoods contain stable residents as opposed to seven percent of neighborhoods that contain a significant portion of residents in transition. Twenty-seven percent of the neighborhoods contained single people with only three percent living in new subdivisions. About 52 percent of the neighborhoods contained a significant portion of urban families and about 45 percent of the neighborhoods contain a significant portion of older homes. Only about seven percent of the neighborhoods contained a significant portion of wealthy families and about 48 percent of the neighborhoods are predominately mixed income families. By far the largest group represented within neighborhoods was the group described as poor. About s79 percent of the neighborhoods contained poor families.

Table 1: Neighborhood Demographics

	N-yes	percent-yes
Seniors/Empty Nest	5	17.2
Normal Mix	9	31.0
Rural	0	0.0
Stable	6	20.7
In transition	2	6.8
New subdivision	1	3.4
Singles	8	27.6
Multi-family	9	31.0
Poor	23	79.3
Wealthy	2	6.8
Urban	15	51.7
Suburban	7	24.1
Highly Mobile	5	17.2
Re-developing	1	3.4
Older Neighborhood	13	44.8
Single Family	7	24.1
Middle-class	5	17.2
Mixed Income	14	48.3

Age of Facility

Principals were asked to give their best estimate of the time period during which most of the space used by students was built. The buildings ranged from fairly new facilities to two 60-year-old complexes, with a mean facility age of 37 years. An analysis of the results is located in Table 2.

Table 2: Facility Age in Years

	N	percent
60 years old or older	2	06.90
50-59 years old	1	03.45
40-49 years old	9	31.03
30-39 years old	8	27.59
20-29 years old	5	17.24
10-19 years old	2	06.90
Under 10 years old	2	06.90
Total	29	100.0

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Windows

Principals were asked whether there are windows in each instructional classroom. Seventy-two percent of the principals who responded indicated that at least three-fourths of the instructional space has windows. An analysis of the results is located in Table 3.

Table 3: Windows in Each Classroom

	N	percent
Less than 1/4 of instructional space	3	10.34
At least 1/4 but less than 3/4 of instructional space	5	17.24
At least 3/4 of the instructional space	21	72.42
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

HVAC System

Principals were asked if the HVAC air system provides clean quality air. Twenty-two of the principals who responded indicated that the HVAC system on their campus provides clean air. Seven or 24 percent of the principals indicated that the system does not provide clean air. An analysis of the results is located in Table 4.

Table 4: HVAC System

	N	percent
Yes	22	75.86
No	7	24.14
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Air Conditioning

The principals were asked if the instructional areas are air-conditioned. All the respondents reported that their instructional facilities are air-conditioned. A summary of their responses is in Table 5.

Table 5: Air Conditioning

	N	percent
Yes	29	100.00
No	0	00.00
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Two principals offered additional comments. One principal pointed out that the air conditioners were "often non-functional." And the other principal indicated that his building uses evaporated coolers for some areas and that "several classrooms share one unit."

Heat Control

The principals were asked if the majority of classrooms have individual heat control. The majority or approximately 69 percent of the principals responded that their schools' classrooms have individual heat controls. Another

thirty-one percent of the principals who responded indicated that the classrooms do not have individual controls. Their responses are recorded in Table 6.

Table 6: Heat Control

	N	percent
Yes	20	69.97
No	9	31.03
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Three principals made additional clarifying comments. The first voiced his frustration that the heaters "often do not work." Another principal noted that the classrooms do not have individual controls and the last principal explained, "Sometimes the controls don't work. For example a given classroom might be extremely hot in wintertime."

Flooring of Instructional Spaces

Principals were asked what kind of flooring is found in the majority of the instructional spaces. Of those that responded, over 89 percent of the buildings have tile or terrazzo floors and only three schools or a little over ten percent of the schools have carpet. The principals' responses are recorded in Table 7.

Table 7: Flooring of Instructional Spaces

	N	percent
Wood Floors	0	00.00
Tile or Terrazzo	26	89.66
Carpet	3	10.34
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Interior Ceilings

The principals were asked what type of material is used for the interior ceilings. Twenty-three of the principals, 79 percent, indicated that acoustical tile is used throughout their instructional areas. Four, 25 percent, indicated that the ceiling is a combination of plaster and acoustical tile. A summary of responses is shown in Table 8.

Table 8: Interior Ceilings

	N	percent
Wood or open beam	0	00.00
Plaster or acoustical in at least 3/4 of instructional space	6	20.69
Acoustical tile throughout the instructional space	23	79.31
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Type of Lighting

The principals were asked what type of lighting is used in the majority of the instructional areas. Generally schools use incandescent and fluorescent lighting. Approximately 82 percent of the principals reported that their school uses fluorescent lighting in instructional area. Only five principals reported that the lighting is incandescent. A summary of these results is in Table 9.

Table 9: Type of Lighting

	N	percent
Incandescent	5	17.24
Fluorescent	24	82.76
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Adequate Lighting

The principals were asked if the lighting in the classrooms is adequate. Not only is it important that the lighting in classrooms is economical, it must be adequate. Over 96 percent of the principals responded that their school's instructional lighting is adequate. Responses are summarized in Table 10.

Table 10: Adequate Lighting

	N	percent
Yes	28	96.55
No	1	03.45
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Wall Color

Question 11 asked the principals to indicate the wall color in the instructional areas. Their choices ranged from dark colors to white. Principals in twenty schools, 68 percent, reported that the walls in the instructional areas of their schools are white, while nine principals reported that the instructional areas are pastel. No principals indicated that the colors of their instructional areas are dark colors. Responses are summarized in Table 11.

Table 11: Wall Color

	N	percent
Dark colors	0	00.00
White	20	68.97
Pastel colors	9	31.03
Does not apply	0	00.00
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Condition of Classroom Furniture

Principals were asked to indicate the condition of the classroom furniture. The majority, sixty-two percent, of the principals responding indicated that the condition of their school's classroom furniture was functionally sound. Nine principals or thirty-one percent indicated there are minor scars in the furniture. Two principals reported that the furniture was scared and damaged. A summary of the responses is in Table 12.

Table 12: Furniture Condition

	N	percent
Most scared and damaged	2	6.90
At least half minor scars but furniture looks good	9	31.03
All classrooms furniture functionally sound	18	62.07
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Utilities and Equipment in Science Room

The principals were asked to indicate which utilities or equipment are available and in usable condition in the science labs. Respondents were asked to

circle all choices that applied. There were three schools, about ten percent, that do not have science labs. Responses are summarized in Table 13.

Table 13: Science Utilities and Equipment

	N-yes	percent-yes
Gas	12	41.38
Water	20	68.97
Sinks	20	68.97
Electricity	22	75.86
No lab	3	10.34
Total	29	

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Several principals offered additional comments. One principal explained that the sinks do not work in the science lab. Another explained that the science lab had "one sink and one water faucet" and the last principal that wrote a comment reported that the building has a new science lab since the science lab was renovated three years ago.

Update Equipment to Science Standards

The principals were asked to indicate how long ago the science equipment was updated to current standards. Their responses range from eight principals with

updates over ten years ago, to six principals who indicated their science equipment is not updated. Three schools have no science labs to update. Responses are summarized in Table 14.

Table 14: Science Equipment Updated

	N	percent
Over ten years ago	8	30.77
Between 5 and 10 years ago	7	26.93
Less than 5 years ago or building is less than 5 years old	5	19.23
It has not been updated	6	23.77
Total	26	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer
- 3 missing

When asked for additional comments, three principals reported poor or non-working science equipment and one responded, "We just opened the science lab with limited money from our regular budget."

Classroom Availability

The principals were asked whether there are enough classrooms to accommodate the existing educational program in the building. Fifty-eight percent

of the principals reported that their school has enough classrooms and 41 percent said they do not. Responses are summarized in Table 15.

Table 15: Classroom Availability

	N	percent
Yes	17	58.62
No	12	41.38
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

One principal offered an additional comment stating, "Within the last two years we have been experiencing a significant student increase due to our housing development."

Portable Buildings

The principals were asked if their building relies on portable buildings for instructional areas. The Ysleta Independent School District is working to reduce the number of portable buildings within the district. At this time almost 66 percent of the respondents indicate that their instructional area relies on portable buildings. A summary of their responses is in Table 16.

Table 16: Portable Buildings

	N	percent
Yes	19	65.52
No	10	34.48
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Of the 19 principals who currently have portable buildings on their campus, seven offered additional information. Two principals have two portable buildings, another principal reported four portable buildings, a principal reported five portable buildings, a principal responded, "We have six portable classrooms." One principal has 19 portables and still another reports, "I'll be probably requesting an additional two to four portables this coming school year."

Noisy Environment

The principals were asked if the building was located near a busy highway, a frequently used rail line, an area where aircraft frequently pass overhead, or any other loud noise-producing environment. If the school was located in these areas, the principal was asked to determine to what extent measures have been taken to

reduce the noise. Sixty-five percent of the principals reported that their school is not in an area of excessive noise. Approximately 21 percent of the principals reported that their campus is in a noisy area and that no measures have been taken to reduce the level of noise. Four principals reported that their school is located in a noisy environment but measures have been taken to reduce the noise. The majority of the principals, 65 percent, indicate that noise was not a problem. The respondents' notations are summarized in Table 17.

Table 17: Noisy Environment

	N	percent
Yes, and no measures have been taken to reduce the level of noise	6	20.69
Yes, but measures have been taken to reduce the level of noise	4	13.79
No	19	65.52
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Two principals made additional comments. One principal said, "Our school is close to a major highway but the traffic noise does not reach the building." Another principal offered information concerning highway noise, "The building is far enough from the highway so that noise is not a factor."

Section II: Questions Related to School Maintenance

Condition of School Grounds

The principals were asked to indicate the condition of the school grounds. Eight years ago Ysleta ISD placed landscaping as a top priority. Ninety-five percent of the principals responding to this survey indicate that their campus has landscaping. Responses are summarized in Table 18.

Table 18: Condition of School Grounds.

	N	percent
No landscaping and sidewalks damaged	1	03.45
Landscaping and sidewalks present and in good repair	13	44.83
Landscaping and other outside facilities attractive	15	51.72
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Although all the principals indicated that the sidewalks and grounds were in good repair. Three principals recorded additional comments. One principal said, "Sidewalks in good repair – landscaping is minimal." Another principal responded, "Needs improvements – We need more help from our district grounds

department." The third principal said, "Front of school is somewhat attractive. Playground area needs to be upgraded."

Condition of Lockers

The principals were asked to indicate the condition of the lockers. Approximately 35 percent of the principals responding are at schools that do not use the lockers. Of the remaining principals, there was considerable variance in their answers. Responses to this question are summarized in Table 19.

Table 19: Condition of Lockers

	N	percent
Most are not functional	1	03.57
At least 3/4 of lockers are functional	8	28.57
Over 3/4 of the lockers are functional	9	32.14
Does not apply	10	35.72
1 missing		
Total	28	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Windows Operational

The principals were asked if the windows in the instructional areas are operational. Approximately 82 percent of the respondents indicated that the

windows are operational with almost 17 percent indicating that the windows are not operational. A summary of their responses is in Table 20.

Table 20: Windows Operational

	N	percent
Yes	24	82.76
No	5	17.24
Does not apply	0	00.00
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Floors Maintained

Question 21 asked the principals to indicate if the flooring is maintained in good condition. One hundred percent of the principals who responded to the survey indicate that the floors are in good condition. Responses are summarized in Table 21.

Table 21: Floors Maintained

	N	percent
Yes	29	100.00
No	0	00.00
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Ceiling Tiles

The principal was asked if the ceiling tiles in the ceilings are clean and without stains. Of the principals who responded, 79 percent indicated that the ceiling tiles are clean and without stains. The principals' responses are summarized in Table 22.

Table 22: Ceiling Tiles

	N	percent
Yes	23	79.31
No	6	20.69
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Interior Walls Painted

Question 23 asked the principals to record the last time the interior walls, including classroom spaces were painted. Over 79 percent said their building has been painted within the last eight years. Responses are summarized in Table 23.

Table 23: Interior Walls Painted

	N	percent
Over 15 years ago	2	06.90
Between 8 and 15 years ago	4	13.79
Less than 8 years ago	23	79.31
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Four principals made additional comments. One said, "Last summer was the first time the school cafeteria was painted." Another principal added, "Some classes have not been painted for 10 or more years." The third principal indicated that work was competed this summer, "We painted one hall per summer. This summer we took turns to paint one hall consisting of 15 classrooms. We are now

complete." The fourth principal adding comments said, "Painted as needed – ongoing."

Exterior Walls Painted

Question 24 requested the principals to state when the last time the exterior walls, or windows and trim were painted. About 24 percent of the principals report that the exterior of their building was painted more than seven years ago and a little over 62 percent report that their building was painted less than four years ago. The mean was at approximately 4.62 years ago since the exterior walls were painted. Responses are recorded in Table 24.

Table 24: Exterior Walls Painted

	N	percent
Over 7 years ago	7	24.14
Between 4 and 7 years ago	4	13.79
Less than 4 years ago	18	62.07
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Roof Leaks

The principals were asked if there were any visible signs of a leak in the roof, any developing signs of a few minor leaks, or if the roof was deteriorating due to major leaks requiring buckets under them. Over 37 percent of those responding reported no visible signs of a leak or only a few water stains. Responses are summarized in Table 25

Table 25: Roof Leaks

	N	percent
Ceiling deteriorating or water falls require buckets	3	10.34
Ceiling is developing a few stains due to minor leaks	15	51.72
No visible signs, or only a few water stains	11	37.94
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Adequate Maintenance Staff

The principals were asked if the number of maintenance staff is adequate for the building. Of the principals responding, approximately 55 percent said the amount of people in their maintenance staff was adequate. Responses are summarized in Table 26.

Table 26: Adequate Maintenance Staff

	N	percent
Yes	16	55.17
No	13	44.83
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Thirteen of the 29 principals indicated that they did not have adequate maintenance staff and made additional comments. The first said, "Inside – yes; grounds – no." The second said, "Always short of plumbers" and the third principal added, "Need 16 but have only 13 staff."

Maintenance Requests

The principal was asked if maintenance requests are completed in a timely manner. Seventy-two percent of the principals responding to the survey indicate that maintenance referrals are completed in a timely manner. Eight principals indicated that the requests are not completed in a timely manner. The results of the principals' responses are summarized in Table 27.

Table 27: Maintenance Requests

	N	percent
Yes	21	72.41
No	8	27.59
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Overall Structural Condition.

The principals were asked to indicate the overall condition of the facilities structure. This includes the condition of the grounds, the condition of the floors, ceiling tiles and windows, the appearance of the walls, and the condition of the roof. About 72 percent of the schools studied rated their building as standard. One school was rated below standard, and seven, or 24 percent, rated their school above standard. Responses are recorded in Table 28.

Table 28: Overall Structural Condition

	N	percent
Below standard	1	03.45
Standard	21	72.41
Above Standard	7	24.14
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Section III: Questions Concerning Housekeeping

Frequency Floors Swept or Vacuumed

The principals were asked how often the instructional area floors are swept or vacuumed. Of the principals responding, over 89 percent said that the floors in their school facility are swept or vacuumed daily. Responses are summarized in Table 29.

Table 29: Frequency Floors Swept or Vacuumed

	N	percent
Monthly	0	00.00
Weekly	3	10.34
Daily or more frequently	26	89.66
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Instructional Floors Mopped or Cleaned

The principals were asked to indicate how often the instructional floors are mopped or cleaned. Approximately 89 percent of the principals responding indicated that their school's floors are mopped or cleaned weekly or daily. A summary of responses is located in Table 30.

Table 30: Instructional Floors Mopped or Cleaned

	N	percent
Annually	1	03.45
Monthly	2	06.90
Weekly or Daily	26	89.65
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Graffiti

The principals were asked if graffiti is found on the premises. There are eight areas that principals could mark as having graffiti. Over half of the principals who responded indicated that there were no problems on their campus with graffiti. Results of the responses are summarized in Table 31.

Table 31: Graffiti

	N	percent
Bathrooms	18	62.07
Lockers	25	86.21
Hallways	25	86.21
Classroom walls/doors	25	86.21
Other Interior surfaces	24	82.76
Exterior walls	22	75.86
Exterior walkways	25	86.21
Exterior Surfaces	18	62.08
Total	29	

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Several principals made additional comments. Most made comments about the frequency of the clean up. The first said, "Building rule – clear within 24 hours." The second indicated that the graffiti was located on student desks but "all graffiti removed daily." The third principal shared, "Exterior doors – graffiti is

removed as soon as it is reported." A fourth principal indicated the graffiti problem was on the portable buildings but it is removed the same day.

Graffiti Removal

The principals were asked how long graffiti remains before it is removed. The Ysleta ISD continues efforts to remove graffiti within 24 hours. Of the principals responding to the survey, one hundred percent indicate that graffiti is removed in less a week. Responses are summarized in Table 32.

Table 32: Graffiti Removal

	N	percent
Until summer maintenance	0	00.00
More than a week but less than a month	0	00.00
Less than a week	29	100.00
Does not apply	0	00.00
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Condition of the Walls

The principals were asked to indicate if the walls are in the instructional areas are clean and in good condition. One hundred percent of the principals

responding to the survey indicate that the walls are clean and in good condition. The responses are summarized in Table 33.

Table 33: Condition of the Walls

	N	percent
Yes	29	100.00
No	0	00.00
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Appearance of Building and Classrooms is Adequate

The principals were asked if the general appearance of the building and classrooms is adequate. Of the principals who responded to the survey, only one principal indicated that the general appearance of the building and classrooms is less than adequate. The results are summarized in Table 34.

Table 34: Appearance of Building and Classrooms Is Adequate

	N	percent
Yes	28	96.55
No	1	03.45
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Hallways Kept Clean

The principals were asked to indicate if the hallways are kept clean during the day. Of the principals who responded 100 percent indicated that the hallways are kept clean. The results of the responses are recorded in Table 35.

Table 35: Hallways Kept Clean

	N	percent
Yes	29	100.00
No	0	00.00
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

One principal was proud to offer, "Our custodial personnel do an extraordinary job taking into consideration the size of the school and the limited custodial personnel we have."

Does School Smell Good

One hundred percent of the principals who responded to this survey indicated that the smell in their school was generally good. The results of their responses are recorded in Table 36.

Table 36: Does School Smell Good

	N	percent
Yes	27	93.10
No	2	06.90
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Only one principal offered an additional comment. The principal wrote, "Close to Mexico border raw sewage smell from time to time."

Is Housekeeping Staff Adequate

The principals were asked if the housekeeping staff during the day is adequate. While approximately 79 percent of the principals responding to the survey indicate that the staff on their campus is adequate, six principals indicated that the staff was not adequate. The principals' responses are summarized in Table 37.

Table 37: Is Housekeeping Staff Adequate

	N	percent
Yes	23	79.31
No	6	20.69
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Two principals made additional comments. The first was a note of celebration. The principal wrote, "They are well trained and have all the supplies." The second principal shared a concern. The principal responded, "I need custodial personnel (more students) demand more quality of services. We grew 150-170 more students and the number of custodial personnel is the same."

Overall Cosmetic Condition of Facility

The principals were asked to indicate the overall cosmetic condition of the facility. Close to 62 percent of the principals responding ranked their school facility below standard concerning the overall cosmetic condition. Ten principals, or 34 percent, ranked the cosmetic condition of their school facility as standard. The results of the principals' responses are summarized in Table 38.

Table 38: Overall Cosmetic Condition of Facility

	N	percent
Below standard	18	62.07
Standard	10	34.48
Above standard	1	03.45
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Two principals shared comments. The first one had a concern. The principal said, "My school is one of the oldest schools in the district and major remodeling has not been done." The second one made a general comment, "It is high especially if the colors are bright and clean."

Academic Performance Affected by Facilities

The principals were asked if the shareholders of the school generally believe the conditions and availability of educational facilities affect the level of academic performance. Over 93 percent of the principals responding to the survey indicate that the shareholders of their school believe the condition of the school affects the level of academic performance by their students. Only two principals were uncertain. A summary of the responses is located in Table 39.

Table 39: Academic Performance Affected by Facilities

	N	percent
Agree	27	93.10
Disagree	0	00.00
Opinion Uncertain	2	06.90
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Current Condition of Educational Facility

The principals were asked to indicate if shareholders believe the current condition of their school campus and the availability of educational facilities are a

positive, negative or have no influence on student achievement. Only two principals indicated a belief that the condition of the school campus and availability of educational facilities has no influence. The responses are summarized in Table 40.

Table 40: Current Condition of Educational Facility

	N	percent
Positive	27	93.10
Negative	0	00.00
No Influence	2	06.90
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Approximate Square Footage of Facility

The principals were asked to calculate the approximate gross square footage of the school facility using the building's rough dimensions. The buildings ranged from 50,000 square feet to 960,000 square feet. Nineteen of the facilities ranged between 50,000 and 100,000 square feet. It is unclear as to whether these figures include the square footage of the portable buildings reported by 19 out of the 29 principals.

Table 41: Approximate Square Footage of Facility

	N	percent
50,000 to 100,000 square feet	19	65.51
100,001 to 150,000 square feet	2	06.90
151,000 to 200,000 square feet	0	00.00
200,001 to 250,000 square feet	1	03.45
250,001 to 300,000 square feet	0	00.00
300,001 to 350,000 square feet	2	06.90
350,001 to 400,000 square feet	0	00.00
400,001 to 450,000 square feet	1	03.45
960,000+ square feet	1	03.45
Missing	3	10.34
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Approximate Acreage of School Campus

The principal was asked to calculate the approximate acreage of the school campus. Six of the principals indicated that they did no know how many acres were on their campus. The results are summarized in Table 42.

Table 42: Approximate Acreage of School Campus

	N	percent
5 or less acres	7	24.13
6 to 10 acres	8	27.59
11 to 15 acres	2	06.90
16 to 20 acres	1	03.45
21 to 25 acres	1	03.45
26 to 30 acres	0	00.00
31 to 35 acres	1	03.45
40 to 45 acres	1	06.25
45, 46 and 47	2	12.50
Missing	6	20.68
Total	29	100.00

- "N" represents the number of schools choosing this answer
- "percent" represents the percent of schools choosing this answer

Additional Comments on Relationship Between Building Conditions and Student Achievement

Only one principal wrote that in the opinion of this principal the condition of the building does not impact student achievement. The elementary school principal wrote, "The building is 30 years old and lacks many current 'standard' facilities or features. This condition does not, or at least, has not affected student performance negatively." The remainder of the comments made by the principals pertains to their belief that the condition of their school does make a difference in student achievement. One principal wrote, "Students feel important when the

school is kept clean and well maintained." Another principal wrote, "Students take pride in their school when it is well maintained."

Still other principals indicated that the condition of their school campus does make a difference. One principal wrote, "The more appropriate the building's physical condition the more probability of student progress and/or success." Another principal wrote a short note, "Definite correlation." Still another principal believes the building impacts both teaching and learning and said, "The conditions of a building certainly impacts teaching and learning positively or negatively." Of course, some principals feel more strongly about a connection than others. One principal said, "Building and grounds conditions definitely have an impact or influence on student achievement and expectations." Finally, a principal indicated that the condition of a building could negatively impact student achievement by saying, "I believe that facilities that are unclean and in poor repair do have a negative impact on student achievement."

Additional Comments

Only one principal made an additional comment. It was the same principal that stated the age of the campus did not have an effect on student achievement at his campus. The principal commented, "This survey equates cleanliness and minor maintenance with student performance, not to what I would term the "condition" of the building. If you were asking whether cleanliness and minor

upkeep by the campus custodians is related to student performance, then I would agree."

Variable Description and Criteria

A complete description of all variables with their code names is located in Appendix 1. Table 43 contains the variable descriptions and criteria used in the multiple regression trials.

Table 43: Variable Descriptions and Criteria

Variable	Mean	Std Dev	Min	Max	N Label
MAINTEN	2.25	.45	1.00	2.50	29
CLEAN	2.27	.17	1.75	2.50	29
COSMETIC	2.33	.49	2.00	3.00	29
STRUCTUR	2.33	.49	2.00	3.00	29
BUILD_AG	4.20	1.42	1.00	7.00	29
TAAS_DIS	84.55	5.22	70.20	90.30	29
TAAS_MEX	84.40	4.86	74.90	91.30	29
TAAS_ALL	84.88	5.17	74.90	90.90	29
TAAS_BLK	86.08	7.43	72.70	95.70	14
TAAS_WHT	90.05	9.98	64.30	100.00	23
DISADVAN	624.10	319.96	318.00	1806.00	29
SCH_SIZE	928.05	643.47	387.00	2624.00	29

Predictors and Criterion Variables

The schools had an average of 928 students (SD = 643.47), of which 624.00 (SD=319.96) were disadvantaged. Overall cleanliness was calculated by averaging four items: are the walls clean (clean33), is the building's appearance adequate (appear 34), are the halls clean (hall35), and does the building smell clean (smell36). Overall maintenance was calculated by averaging two items: number of staff adequate (staff26) and work completed in a timely manner (mtreq27.) In terms of the independent variables (i.e., predictors), the average building age, overall cleanliness, overall structure, overall cosmetic, school size, and overall maintenance were categorized as "standard." Table 44 shows the dependent variables (i.e., criterion), the TAAS scores, means, standard deviations, minimum and maximum, and frequency by race.

Table 44: TAAS Scores Means, Standard Deviations, Minimum and Maximum, and Frequency By Race.

Race	Mean	Std Dev	Min	Max	n
All	84.88	5.17	74.90	91.60	29
Black	86.08	7.43	72.70	95.70	14
Disadvantaged	84.55	5.22	70.20	90.30	29
Mexican	84.40	4.86	74.90	91.30	29
White	90.05	9.98	64.30	100.00	23

"Min" represents the minimum percent of students passing All TAAS tests from a particular school in 2001

"Max" represents the maximum percent of students passing All TAAS tests from a particular school in 2001

"N" represents the number of schools answering the survey that reported students of this race.

Regressions Equations

The term multiple regression was first used by Karl Pearson in 1908 and is an extension of his work with statistical relationships (Pearson, 1938). The purpose of multiple regression is to learn more about the relationship between several independent or predictor variables and a dependent or criterion variable. Multiple regression procedures are widely used in social and natural science research. It allows the researcher to investigate the best predictor of an event.

The regression formula is much like the formula for a line, $y = mx + b$. The "y" represents the dependent or *criterion* variable, the "x" represents the independent variable or *predictor* variable and the "m" or slope represents the regression coefficient or *beta* weights.

The regression coefficients or beta weights represent the independent contributions of each independent variable in predicting the dependent variable. The best predictions are made when the variability of the residual value is small and hovers around the regression line. If there is no relationship between the "x" or *predictor* variable and the "y" or *criterion* variables, then the variance is equal to 1.0. If the "x" or predictor variable and the "y" or criterion variables are perfectly related then there is no residual variance and the ratio of variance will be between 0.0 and 1.0. This ratio is subtracted from 1.0 to determine the R-square or the coefficient of the determination. This means that if there is an r-square value

of .6 then the variability of the Y values is 1.0 – 0.6 times the original variance. The data has explained 60percent of the original variability and there is a 40percent residual variability. The r-square value is an indicator of how well the model or trial fits the data. An r-square value close to 1.0 indicates that the data has accounted for almost all of the variability.

For multiple linear regressions, it is assumed that the relationship between the variables of interest is linear. In multiple regression, the R can assume values between 0 and 1. Beta weight is the coefficient in the regression equation that describes the relationship between the predictor and the criterion. If the B coefficient is positive, then the relationship is positive, and if the B coefficient is negative then the relationship is negative. If the B value is zero, there is no relationship.

Seemingly Unrelated Regression (SUR)

The seemingly unrelated regression method is a special case of generalized least squares with a residual covariance matrix of a particular structure. The seemingly unrelated regression (SUR) model was proposed by Arnold Zellnar in 1962. It is a special case of the Aitken estimator. SUR obtains seemingly unrelated regression estimates of a set of nonlinear equations. Seemingly unrelated regression estimates are obtained by estimating a set of nonlinear

equations with cross-equation constraints imposed, but with a diagonal covariance matrix of the disturbances across equations. These parameter estimates are used to form a consistent estimate of the covariance matrix of the disturbances, which is then used as a weighting matrix when the model is reestimated to obtain new values of the parameters. These estimates are consistent and asymptotically normal, and under some conditions, asymptotically more efficient than the single equation estimates (Zellnar, 1997). This method was helpful because of its ability to relate data over time.

Building Conditions, Student Subgroups, and TAAS Scores

Six linear multiple regressions were conducted to examine how much school size (determined by total square feet of facilities), building age (determined by years of service), overall cleanliness (determined by the principal ranking custodial ability to keep the campus clean), overall maintenance (determined by principal ranking the maintenance workers ability to keep the campus repaired), overall structure (determined by the principal ranking the efficiency and condition of the building structure), overall cosmetic (determined by the principal ranking the esthetic quality of the total school facility), and being classified as disadvantaged (determined by the student's acceptance into the federal reduced lunch program) explain TAAS scores for students of different races. All of the

predictor variables were put into the regression equation. The degree of freedom was determined by the total number of observations minus the number of variables appearing in the model. Only the variables whose beta coefficients significantly affected the criterion remained in the equation. That is, the r-square or prediction of the equation did not increase with variables that dropped out of the equation.

The seemingly unrelated regression method was used on the sixth regression. TAAS results were stacked for each of the eight years by school and were used as the criterion. Eight years of data for building age and population size was stacked and used as the predictors. SUR analyzed the least squares and the generalized least squares estimators jointly for each equation.

First Regression

The first regression used the percent of all students passing the TAAS test (TAAS All), as the criterion and school size, building age, overall cleanliness, overall maintenance, overall structure, overall cosmetic, and the number of students classified as disadvantage as the predictors. In the regression analysis, Building age explained 42.5percent of the variability in TAAS All scores for all students. Table 45 shows the Beta weights for Building age was predictive of TAAS total scores, $F(1, 28) = 4.83$, $p < .05$. No other variable entered the equation.

Table 45: Beta Weights, T value, and Probability for T value when TAAS Total is the Criterion.

Variable	Beta	T	Prob. T
Age	0.42	2.20	.05

Second Regression

A second regression used the percent of students classified as disadvantaged by the federal reduced lunch program that passed all subsections of the TAAS test (TAAS Disadvantaged) as the criterion and school size, building age, overall cleanliness, overall maintenance, overall structure, overall cosmetic, and number of disadvantaged students as the predictors. In the regression analysis, building age and maintenance explained 63.0 percent of the variance in TAAS disadvantaged scores. Table 46 shows the Beta weights for building age and maintenance were predictive of TAAS disadvantaged scores, F (2, 27) = 6.92, $p < .01$. No other variable entered the equation.

Table 46: Beta Weights, T value, and Probability for T Value When TAAS Disadvantaged Students is the Criterion

Variable	Beta	T	Prob. T
Building Age	0.62	3.45	.01
Maintenance	-0.42	-2.34	.05

Third Regression

A third regression used the percent of Hispanic students that passed all the subsections of the TAAS test (TAAS Hispanic), as the criterion and school size, building age, overall cleanliness, overall maintenance, overall structure, overall cosmetic, and number of students classified as disadvantaged as the predictors. In the regression analysis, Building Age explained 46 percent of the variance in TAAS Hispanic scores. Table 47 shows the Beta weights for Building Age was predictive of TAAS Hispanic scores, F (1, 28) = 5.84, $p < .05$. No other variable entered the equation.

Table 47: Beta Weights, T value, and Probability for T Value When TAAS for Hispanic Students is the Criterion.

Variable	Beta	T	Prob. T
Building Age	0.46	2.42	.05

Fourth Regression

The fourth regression equation used the percent of white students who passed all the subsections of the TAAS test (TAAS White) as the criterion and school size, building age, overall cleanliness, overall maintenance, overall structure, overall cosmetic, and number of students classified as disadvantage as the predictors. In this regression analysis, cleaning explained 49.8 percent of the variance in TAAS White scores. Nine of the participating schools had such a low number of students classified as white that the Texas Education Agency did not report the passing percentages. Table 48 shows the Beta weights for cleaning was predictive of TAAS White scores $F(1,19) = 5.94$, $p<.05$. No other variable entered the equation.

Table 48: Beta Weights, T value, and Probability for T value when TAAS for White Students is the Criterion

Variable	Beta	T	Prob. T
Cleaning	-0.498	-2.44	.05

Fifth Regression

The fifth regression equation used the percent of black students that passed all the subsections of the TAAS test (TAAS Black), as the criterion and school size, building age, overall cleanliness, overall maintenance, overall structure, overall cosmetic, and number of students classified as disadvantaged as the predictors. No variable entered the equation and the *F* could not be calculated.

Change in TAAS Scores Over Time

Ysleta Independent School District educators and the students within the Ysleta district have made phenomenal improvements in student achievement during the past eight years. Part of the evidence of this improvement can be seen in the individual campus' percentage of students passing all subsections of the TAAS test and part can be seen in the district's percent passing scores over the past eight years.

Table 49: TAAS All Tests Taken – All Students – Percent Passing – 1994-2001

School	1994	1995	1996	1997	1998	1999	2000	2001	Change
1	22.0	22.6	33.9	47.7	60.6	59.0	80.3	77.7	+55.7
2	44.5	51.9	55.3	59.9	78.1	78.6	83.3	89.1	+42.6
3	44.7	59.2	53.3	69.6	72.1	75.5	85.5	88.2	+43.5
4	34.5	29.8	56.2	62.1	63.8	68.8	75.7	75.6	+41.3
5	39.4	47.5	62.3	76.6	79.8	80.3	74.0	77.4	+38.0
6	60.1	61.7	77.9	80.6	88.2	90.8	92.7	89.8	+29.7
7	38.7	44.5	57.3	69.9	72.7	79.5	81.2	84.9	+46.2
8	53.3	51.2	60.2	72.1	76.9	79.7	86.1	90.9	+37.6
9	38.0	34.6	58.4	67.4	80.3	76.8	75.8	82.2	+44.2
10	45.7	44.1	67.4	71.5	77.9	82.0	85.1	85.7	+40.0
11	36.3	33.2	56.4	70.6	75.5	80.2	80.8	85.4	+49.1
12	58.7	68.4	74.5	79.0	90.7	87.7	90.0	86.7	+28.0
13	51.7	59.2	68.5	81.6	86.3	89.0	93.6	89.9	+38.2
14	37.3	54.7	61.3	76.5	88.1	86.5	90.3	90.6	+53.3
15	45.9	55.9	58.5	75.5	80.5	82.7	77.2	76.1	+30.2
16	29.2	37.1	46.7	60.6	74.3	75.9	77.8	82.0	+52.8
17	37.8	47.8	68.7	76.0	86.5	83.1	81.3	80.2	+42.4
18	46.0	58.3	63.7	73.5	78.5	84.4	91.5	82.4	+36.4
19	41.7	60.6	71.2	82.2	84.9	84.6	87.5	85.2	+43.5
20	48.4	62.6	75.8	69.8	83.2	78.2	82.7	74.9	+26.5
21	61.1	77.3	82.4	82.4	93.1	90.3	85.9	86.5	+25.4
22	51.3	60.1	70.2	79.7	86.9	89.4	87.3	89;7	+38.4
23	73.2	73.9	83.3	86.8	93.8	89.9	91.3	91.6	+18.4
24	52.9	47.3	69.5	73.4	83.7	84.9	86.6	88.1	+35.2
25	42.6	53.3	64.8	77.1	84.2	80.2	83.3	79.1	+36.5
26	53.9	50.4	66.7	80.1	86.8	84.2	84.9	85.5	+31.6
27	35.1	40.5	53.7	67.3	75.2	81.8	85.3	88.9	+53.8
28	53.9	46.1	66.2	71.4	79.8	78.6	70.6	79.3	+25.7
29	55.7	72.2	77.8	89.0	92.9	91.7	93.4	92.7	+37.0
District Avg.	47.5	54.5	65.4	73.4	80.0	82.1	83.7	84.6	+37.1

- Change – Percent of change between 1994 - 2001

Table 50: TAAS All Tests Taken – Hispanic Students – Percent Passing

School	1994	1995	1996	1997	1998	1999	2000	2001	Change
1	21.0	23.3	33.9	47.4	59.0	58.4	79.3	76.9	+55.9
2	39.9	45.8	49.7	55.2	74.2	77.3	83.4	87.0	+47.1
3	37.7	54.7	47.9	64.2	69.2	72.4	85.2	86.6	+48.9
4	33.7	30.3	55.5	62.7	63.2	68.0	75.5	57.7	+42.0
5	41.0	48.7	61.4	76.6	79.2	80.8	74.6	77.1	+36.1
6	51.2	56.5	74.9	78.4	85.6	89.4	91.7	88.4	+37.2
7	38.3	43.9	56.9	69.6	72.8	79.6	81.4	84.7	+46.4
8	45.6	44.0	54.8	68.6	73.5	76.8	84.2	89.2	+43.6
9	36.2	33.5	57.9	66.9	79.9	77.6	75.3	81.8	+45.6
10	45.6	44.2	67.3	71.4	78.2	82.1	85.1	85.8	+40.2
11	37.4	33.1	56.2	70.1	74.5	79.9	81.1	84.8	+47.4
12	58.8	68.1	72.3	78.3	89.4	85.7	89.9	86.3	+27.5
13	48.6	58.4	65.8	80.3	85.5	88.6	92.4	89.6	+41.0
14	36.7	55.3	61.7	76.2	87.6	86.0	90.8	91.3	+54.6
15	45.7	54.3	57.8	75.2	79.3	83.3	76.9	77.0	+31.3
16	38.5	36.3	46.0	60.5	74.1	75.5	77.3	81.7	+53.2
17	37.0	47.0	68.1	75.3	86.4	83.4	81.0	80.5	+43.5
18	46.6	57.1	64.0	72.1	78.2	83.8	92.1	83.7	+37.1
19	40.1	61.2	70.6	81.8	84.3	84.0	87.2	84.7	+44.6
20	46.2	64.6	76.7	72.6	85.6	77.5	81.1	74.9	+28.7
21	50.0	83.3	80.0	80.0	80.0	100.0	80.0	100.0	+50.0
22	46.8	56.6	68.6	77.3	85.1	88.4	86.6	89.4	+42.6
23	69.6	70.1	79.7	84.6	92.7	88.5	91.4	90.5	+20.9
24	49.1	43.5	66.4	71.7	81.9	84.1	87.2	86.7	+37.6
25	42.5	54.0	64.8	76.9	83.9	80.0	93.2	78.4	+35.9
26	53.9	50.5	66.2	79.6	86.3	84.3	85.2	84.4	+30.5
27	34.1	40.4	54.1	66.6	75.1	81.8	84.8	88.5	+54.4
28	50.9	43.9	65.4	69.9	80.9	77.5	66.9	77.5	+26.6
29	55.4	71.5	77.6	88.8	92.5	91.8	93.7	92.5	+37.1
District Avg.	44.1	51.8	63.4	71.9	78.6	81.2	82.9	83.9	+39.8

- Change – Percent of change between 1994 - 2001

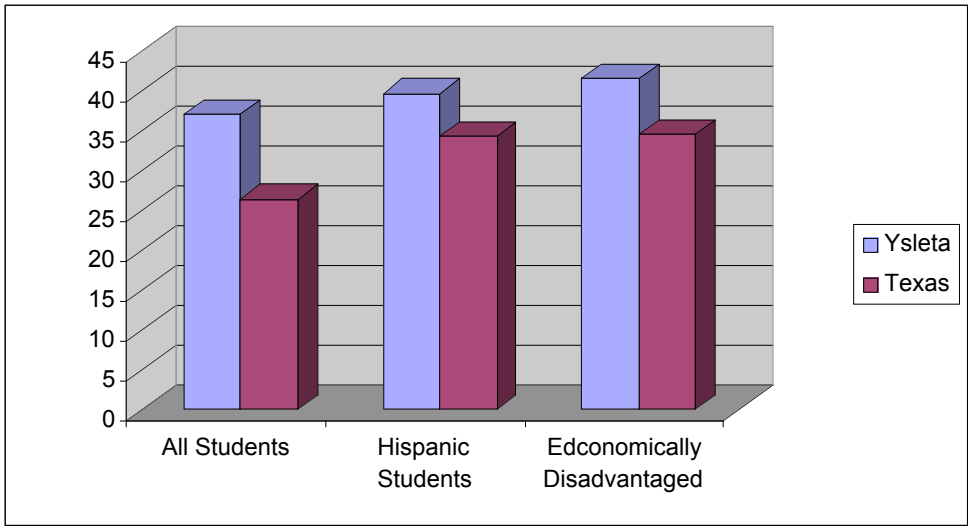
Table 51: TAAS All Tests – Economically Disadvantaged - percent Passing

1994-2001

School	1994	1995	1996	1997	1998	1999	2000	2001	Change
1	07.4	22.6	33.6	46.0	56.6	58.3	78.4	77.0	+69.6
2	*	41.0	41.1	50.9	73.4	75.6	78.5	87.6	*
3	-	38.5	45.2	55.7	65.2	59.5	82.6	87.0	-
4	32.9	28.5	55.6	57.0	57.1	67.5	73.9	74.2	+41.0
5	37.1	45.6	59.8	74.5	78.1	79.0	73.1	76.9	+39.8
6	39.7	42.2	63.5	70.4	79.5	85.3	89.1	87.5	+47.8
7	*	40.4	54.5	68.4	70.5	78.8	79.4	84.6	-
8	48.1	46.7	54.4	69.0	74.1	78.0	83.9	90.3	+42.2
9	26.0	30.9	56.5	63.7	79.0	77.3	73.7	81.1	+55.1
10	40.7	41.1	65.1	68.0	75.5	80.6	83.5	85.0	+44.3
11	31.5	30.7	55.4	69.5	74.3	79.5	79.9	84.2	+52.7
12	54.2	64.7	72.1	77.9	89.1	87.6	88.2	85.3	+31.1
13	38.7	54.5	62.9	76.8	82.3	87.5	92.7	87.7	+49.0
14	32.8	52.9	57.5	78.5	88.2	85.4	89.4	89.5	+56.7
15	45.6	53.7	56.6	71.8	79.1	81.3	73.6	74.4	+28.8
16	28.3	35.4	46.0	59.3	72.6	75.6	77.8	82.3	+54.0
17	31.6	47.3	65.4	73.6	86.2	81.8	79.9	81.6	+50.0
18	48.5	57.1	62.1	73.4	78.0	83.9	91.5	82.0	+33.5
19	36.1	61.8	72.2	81.3	84.0	82.9	87.0	84.8	+48.7
20	47.6	61.7	75.0	69.5	82.4	76.7	83.4	76.7	+29.1
21	59.7	75.0	81.1	79.4	92.3	89.0	85.1	87.1	+27.4
22		51.6	65.0	71.9	83.3	87.1	83.8	87.3	*
23	67.3	65.5	81.4	79.3	92.0	87.9	89.7	91.4	+24.1
24	44.6	36.2	62.7	64.6	80.4	80.0	85.0	92.5	+47.9
25	41.7	51.6	65.4	76.2	83.0	79.6	84.0	77.8	+36.1
26	52.5	48.7	64.9	78.4	84.7	82.4	82.2	83.2	+30.7
27	33.5	39.7	54.1	67.7	73.9	80.9	84.8	89.5	+56.0
28	49.3	41.6	63.8	68.7	77.3	77.5	68.2	79.1	+29.4
29	*	70.0	76.3	87.8	92.6	91.4	93.2	93.1	*
District Avg.	41.7	49.8	61.8	70.3	77.4	80.1	81.8	83.3	+41.6

- Change – Percent of change between 1994 – 2001

Table 52: Percent of Change in TAAS All scores from 1994 to 2001



Sixth Regression – Seemingly Unrelated Regression System (SUR)

A regression model may contain a number of linear equations. A set of equations that has cross-equation error correlation can be referred to as a seemingly unrelated regression. Although the equations may seem unrelated, the equations are related through the correlation in the errors. This regression method was chosen to compensate for the small data set resulting from this case study. Eight years of data for each of the twenty-nine schools was "stacked" to provide sufficient data points enhancing the information content.

The sixth regression used the percent of All Students passing All Subsections of the TAAS test at each of the twenty-nine campuses for eight years as the dependent or criteria variables, with school size and building age as the

independent or predictor variables. In the regression analysis, building age and school size explained 4.0 percent of the variance in TAAS scores. Table 53 shows the Beta weights for Building Age and School Size were predictive of TAAS scores, $F(2,841) = 16.74$, $p<.0001$.

Table 53: Beta Weights, T value, and Probability for T value when TAAS is the Criterion

Variable	Beta	T	Prob. T
Building Age	0.07	2.00	.05
School Size	-0.20	-5.73	.0001

Summary

This chapter reported the results of the research study conducted over a period of 10 months in Ysleta Independent School District. The study utilized several lengthy interviews, a questionnaire to principals concerning the condition of their buildings and student achievement, various district and state document reviews, on-site field study and a statistical analysis of the survey and student TAAS test results.

The interviews contributed to the study through the identification of four major themes, risky decisions, powerful people, buildings make a difference, and

accountability. Within the major themes the five sub-themes of determination, symbolic trust, economic value, politics and pride emerged. The results of the survey added to the discussion. Principals were asked questions concerning the structure, maintenance and cosmetic condition of their school facilities and to speculate as to the possibility of links to student achievement. Finally, the survey and student TAAS scores were statistically analyzed using multiple regressions. This mixed method approach provided an in-depth description of one districts attempt to improve student achievement and school facilities.

This chapter discussed a single case study of the Ysleta Independent School District and detailed the findings of the interviews, provided descriptive characteristics concerning each question in the survey, detailed the results of the six regressions performed on the collected data, presented findings related to the three research questions and summarized the results. The effect school facilities have on student achievement will be revisited in Chapter V and the findings of this study described in detail. The chapter will conclude with a discussion of the conclusions brought forth by the data and recommendations for further study.

CHAPTER V

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS FOR FUTURE RESEARCH

Chapter V contains a summary of the study and the findings discussed in Chapter IV, an analysis of those findings, a statement of appropriate conclusions, implications, limitations and recommendations for further study suggested.

Summary of the Study

This mixed method case study of the Ysleta Independent School District in El Paso, Texas, investigates questions concerning the effect school facilities have on student achievement. The study questions are:

1. What factors directly affect the decision to include facilities as a component of educational adequacy?
2. How does availability of funds impact priorities regarding maintenance, renovation, and construction of facilities?
3. To what extent can student achievement on the TAAS test be explained by socio-economic condition, school size, building age, cleanliness, maintenance, and the condition of the school's structure?

The Ysleta Independent School District research department granted permission to study eight years of TAAS data for thirty-three randomly selected schools, conduct interviews with key district administrators and distribute a survey to each school in the study. Surveys were sent to the thirty-three principals concerning the condition of their campus facilities. After two weeks, notes were sent thanking the principals who returned their surveys and asking the rest to complete and mail the surveys back. Twenty-nine of the thirty-three surveys were returned. The researcher visited each campus in the study and conducted in-depth interviews with the former superintendent, Tony Trujillo, and a district appointed representative, Manny Soto.

The interviews were transcribed, checked for major themes, coded and recorded. Data from the survey's were compiled and analyzed. Five regression analyses were conducted using the 2001 percentages at each of the twenty-nine schools for All Students, Hispanic Students, White Students, and Economically Disadvantaged Students passing the TAAS test as the criteria, and building age, cleanliness, structure, school size, overall maintenance and number of students classified by the federal reduced lunch program as disadvantaged at each campus as the predictors. A sixth seemingly unrelated regression analysis was conducted by stacking the criteria and predictor data for each campus from 1994 until 2001.

Analysis of Findings

Interview Findings

The process of educating children is a complex system that contains people, property and products. Each part intermingles with the next and no part can stand-alone. This study investigates Ysleta Independent School District's successful plan to improve student achievement. Parts of the study's questions are best addressed using the voices of the participants and result in a deeper, thicker description of the story through the context of their lived experience. Through the themes of risky decisions, powerful people, buildings matter, and accountability, Mr. Anthony Trujillo, Mr. Manny Soto and the principals of twenty-nine Ysleta ISD schools express that success with which individuals pass through a given organization is dependent upon how well his or her personal attributes converge with or match the institution (Moore, 2000). Lord and Maher (1991) proposed that the effectiveness of top-level leaders depends on their discretion to make innovative, major changes in key areas of organizational strategy that will affect the performance of the organization five to twenty years in the future. For these and many other reasons, this group of educators banded together to look outside the box for answers to successful student achievement. They found ways to place the needs of all children at the focus of their work.

What factors directly affect the decision to include facilities as a component of educational adequacy?

The first and most compelling decision occurred in 1992 and was made by the Ysleta School Board when it offered Anthony Trujillo, a retired school superintendent from California, the superintendency of the Ysleta Independent School District. Through Trujillo's leadership, the definition of educational adequacy evolved from hope for a better handout, to faith in the district's ability to place Ysleta on an equal playing field with the best districts in Texas.

In 1992, an interesting phenomenon was occurring in El Paso. The Ysleta school district is cut in half by Interstate 10. As families became more affluent they migrated from the south side of town to the north. This movement polarized the city and resulted in class issues. To the north of Interstate 10 were middle-class Hispanic neighborhoods and crowded schools. To the south of Interstate 10 were poor Hispanic neighborhoods and half-empty schools. The school buildings mirrored the wealth of the surrounding residential neighborhoods.

Following his arrival to El Paso, Trujillo asked permission of the Board to spend a few months getting to know the people in the district. It was the first of several factors that contributed to his decision to include facilities in his plan for academic success. Mr. Trujillo met with every school and every department office in the district central office. What he found was a hugely inefficient bureaucracy with large overhead costs, dilapidated buildings needing repair and renovations,

students who's TAAS scores were some of the lowest in the state and layers of ineffective decision-making at the central office. He was particularly troubled by the condition of the central office of Construction and Maintenance.

The state had placed the Ysleta ISD on notice and instructed it to tear down Ysleta High School. In the opinion of the Texas Education Agency, the school was unsalvageable. The maintenance workers of Ysleta HS were frustrated because the school was in the heart of their neighborhood and the oldest high school in town. They saw the closure of Ysleta High as a continued marginalization of their neighborhood by the district. The district's maintenance workers complained that the district expected them to maintain the buildings without the proper equipment and then the district stood by when the buildings began to fall apart.

Interestingly, many of the most prominent members of the El Paso community and many of the teachers and administrators within the district had graduated from Ysleta High School. One of the workers at the high school was from Mexico and was a Mexico University degreed architect. He told Trujillo that he could, with the proper tools, renovate the building. In fact, the cost would be a mere two million dollars. Trujillo decided to renovate rather than tear the high school down.

Trujillo's decision to accept the man's offer to renovate Ysleta High School would eventually place facilities at the heart of his plan for educational

adequacy. Trujillo said, "The first school building we renovated was located in the poorest part of town. As the building was transformed back to its heyday the local community was energized." Mr. Soto explained the factors contributing to the decision as, "There are three legs to this stool. The facility issue was one leg and the other one was simultaneously the ten million dollars for the construction program. The third leg of the stool was the psychology of the workforce."

Another factor contributing to the decision to include facilities was the coincidental makeup of the school board. One member of the Board was a civil engineer. Another was an electrical engineer and one worked at an engineering firm. There was a salesman and a real estate agent. Due to the Board's outside employment and their personal belief systems, the majority of the Board believed that the physical condition of school facilities made a difference in the quality of the schools.

Trujillo's concern about the lack of pride throughout the district was also a factor in his decision to include facilities. He said, "My theory is that the environment surrounding people, has a great deal to do with their attitudes about everything about themselves." He felt taxpayers, teachers and students needed something concrete to represent trust and pride in their abilities and faith in the future. Trujillo said, "If the grounds are not manicured, if there is graffiti on the building that's not going to be inviting, not only to the children but to the parents

as well." He believed the facility program could be symbolic for the district and he began to market it that way. Renovation of their dilapidated buildings was a component his constituents could see, touch and feel. He used it as a vehicle to prove that all people regardless of their age, heritage or income have talents and they can use their talents successfully when they have the right tools and encouragement. Trujillo explained, "They were giving it their finest. So there was a lot of caring that went on about the facility program. All of a sudden the whole district began to change because of the facilities." Through determination, symbolic trust, economic value, politics and pride, Trujillo made the decision to include the condition of facilities as a component of educational adequacy.

How does availability of funds impact priorities regarding maintenance, renovation and construction of facilities?

The Ysleta Independent School District was listed by the Texas Education Agency as a property poor district in 1992 and remains on TEA's property poor district list today. Further, El Paso is comprised of a large Hispanic population as well as a population characterized by poverty. Historically on the state level, both of these groups suffer from low TAAS scores. During the school year preceding Trujillo's superintendency, Ysleta spent 9.7 percent of its operating fund on construction, maintenance and renovation. During the Trujillo's years as Ysleta's superintendent, he spent an average of 11.0 percent of the operating fund on

construction, maintenance and renovation each year. Today the district serves 34,038 economically disadvantaged students. This accounts for about 73.4 percent of the total student population. The district's total expenditures for 2000 – 2001 school year were $273,841,128 and its total construction, maintenance and renovation costs were $26,762,308 or 10.3 percent of the operating fund.

Trujillo knew when he accepted the superintendency that the Ysleta ISD was a poor district but his history of success in a California district with less access to state aid gave him hope. He believed the key to Ysleta's financial stability was to learn how to work the Texas system to his district's advantage. El Paso residents were openly frustrated with the Ysleta ISD's last bond election. The facilities built using the bond money were inadequate and poorly constructed. There was talk throughout the district and the community of possible mishandling of the bond money by the district and insider "deals" with the contractors. Many of the district's board members were elected using campaign slogans of "no new taxes." Trujillo observed early in his tenure that there were huge questionable expenditures flowing through the Maintenance and Construction district office. He arranged for the director of the department and his staff to leave the district. This decision had a ripple effect.

By removing the director and the department, Trujillo was able to hire his own team. The new director understood the workers. He understood the culture and how to get the most from the department. The director gave the maintenance

and in-house construction workers leeway to use their talents; he did not dictate but oversaw. The district changed its procedures for purchasing materials and either found uses for stored materials or got rid of them. This maneuver saved the district thousands of dollars and freed hundreds of square feet of storage space. The Maintenance and Construction Office also placed checks and balances into the system. Purchase orders were tracked and individual schools were held accountable for their budgets.

Trujillo formed an in-house construction company. The company was not designed to build new buildings; it was used to renovate and repair buildings at a fraction of the cost. While school districts were spending between $100 and $150 per square foot in 1994, Ysleta spent $50 and never went above $75. An extra benefit was that by saving money on building costs, the district was able to purchase tools and equipment. The men worked extra hours to complete renovation projects under the target dates. The district saved money and the overtime pay helped the workers. As the workers socio-economic status improved so did their commitment to excellence. The district began to build a "we can do it" attitude among the constituents and schools within the Ysleta district began to look like schools affluent families chose.

Although the Board originally opposed a tax increase, they raised the local school tax by eight cents. They felt they could use the Texas finance system to their advantage. The school tax raised the district three and a quarter million

dollar. Coupled with a state award of six million the Board was ready to enact its plan. Trujillo discussed with the chairman a "pay as you go" approach to maintenance, renovation, and construction.

During the 1994-95 school year, Trujillo saved enough money to spend a million dollars on power tools and equipment for the maintenance department. He said, "It was a physical demonstration to people in the community that they need not settle for second class anything. And that if we are going to have great buildings, we are going to have a great education inside those buildings." The district was careful to think strategically and consider the costs of their buildings and renovation projects ten to fifteen years ahead. They made their determinations based on best value for the price rather than lowest bidder. Trujillo and his employees managed to keep the district's costs well under the state allotment but did not sacrifice quality.

Trujillo was committed to saving money and he capitalized on the ability of his middle class workers to stretch a dollar and stay within the budget of money raised. This was a new concept for Ysleta. He also held all outside contractors to the parameters of their bids. This culture change came with its own price tag. While Trujillo was successful in having a local architect redraw a building in order to come under the budget number, he was not successful in fending off disgruntled local contractors or politically motivated board members; he saved the city money, built some of the finest school facilities in Texas, but he did not save his career in

the Ysleta ISD. Trujillo left Ysleta in 1998. The benefit of his efforts to improve the condition of Ysleta's school facilities is that while innovative curriculum, masterful delivery of instruction and visionary school leadership can change overnight; brick and mortar have long-term staying power and can contribute positively towards issues of access and equity.

To what extent can student achievement on the TAAS test be explained by socio-economic condition, school size, building age, cleanliness, maintenance, and the condition of the school's structure?

Survey Findings

An analysis of the survey responses reveals a profile of the study group. The responding principals are, for the most part, extremely complementary of their facilities and rate them highly. Over ninety percent of the principals indicate that the overall condition of their facility's structure is standard or above standard. However, principals recorded several structural and cosmetic concerns. Over sixty percent indicate that the overall cosmetic condition of their facility is below standard and many are concerned about overcrowding.

Almost 70 percent of the schools in the study are over 30 years old, and only two schools were built since 1994. These statistics place the majority of schools in this study within the range of the General Accounting Office report of

1995 that stated over half of America's school-aged children attend class in aging buildings over 30 years old and that aging buildings present ongoing challenges that result in costly repairs and extensive renovations. Older buildings are historically more expensive to maintain due to their aging infrastructure. Outdated systems for electricity, air-conditioning, heating and water often result in maintenance delays and problems due to a lack of available parts for the system and the scarcity of skilled labor to repair them. Outdated instructional designs result in problems with instructional flexibility and cause twenty-first century educators to compromise innovation. Further it is difficult at best to anticipate the future budget expenditure needs for buildings over thirty years old. The Ysleta ISD started a systematic renovation and repair program in 1994. Their objective was to determine specific facility needs at each building in order to bring all campuses to a standard comparable to the most affluent districts in Texas.

The survey starts with a section concerning the structure of the principal's school facilities. Although 75percent of the respondents indicated the HVAC air system provides clean quality air, several principals comment that the air conditioner system requires frequent repair. And, while sixty-eight percent of the principals indicate the instructional areas have individual heat controls, many report broken controls and problems with their system. Couple that with the fact that over 30 percent of the principals indicated there are no individual heating and cooling controls in their buildings, and it is easy to see that many Ysleta principals

continue to be distracted by air quality problems. Koval, Berner, Hanson and Edwards all found that environment and, specifically, air quality affect student achievement.

Most principals indicated their buildings were adequate and reported a general satisfaction although space is a problem for many. While most schools have science labs, over 50 percent of the labs have not been updated or the update was over ten years ago. Considering the high percentage of older buildings in Ysleta, the lack of renovation to science labs certainly has implications concerning student access to science technology. About half the principals said they needed more classroom space and over 65 percent of them report they must use portable buildings to accommodate their needs. One principal has nineteen portable buildings and will request two more next year.

The principals were asked a series of questions concerning the housekeeping of their buildings. While they are generally complementary of the staff, they have concerns for their aging facilities. Seventy-two percent of the principals indicate that their maintenance referrals are completed in a timely manner, although about 45 percent do not feel their school has enough staff. Almost 90 percent of the principals in this study report that their floors are swept and vacuumed daily and mopped at least once a week. Ninety-six percent indicate the appearance of their building and classrooms are adequate yet 62 percent

indicate that the overall cosmetic condition of their facility is below their standards.

When asked if the members of their school community believe the conditions and availability of educational facilities affect the level of academic performance, ninety-three percent of the principals responded that it does. In fact, only one principal commented that school facilities do not, in his opinion, affect student performance. The high majority of comments made by principals pertain to their belief that the condition of the school does make a difference in the achievement of students at their school. Obviously, in spite of these obstacles, students made tremendous gains between 1994-2001. The study acknowledges that education is a complex system and no one element can assure success, but it suggests that had the obstacles regarding school facilities been removed, student achievement would be greater.

Regression Findings

An analysis of the six multiple regressions reveal that building age emerged as the most significant predictor of TAAS scores. Other variables found to be significant were maintenance, cleanliness and school size.

Cleanliness. When trying to predict the TAAS score for white students, cleaning accounts for 49.8 percent of the variability. As stated previously, this

single case study resulted in a relatively small sample set. The Ysleta Independent School District's student population contains only nine percent white students. Several schools contain so few white students that TEA does not publish their passing rate. This causes the sample set of white students to be even smaller. A larger sample set is necessary to check the theoretical prediction gleaned from this study that for each additional state of cleanliness, a white student's TAAS score would likely decrease by .50 times the state of cleanliness (TAAS white students = -.50 (cleaning). These results indicate that the state of cleanliness negatively effects the achievement of white students. While curious, these results could indicate that the distraction of people cleaning interferes in some way with white students' achievement.

Building Age, Maintenance, and School Size. In four out of the six multiple regression analyses conducted, the age of the building accounted for the greatest percentage of variance in the TAAS scores and was the first variable entering the equation. When trying to predict the achievement as measured by the TAAS test for all students, building age accounted for 42.5 percent of the variability in the scores. The study suggests that out of all the reasons why a student would receive a particular TAAS score, building age explained 42.5 percent of those reasons. Although the sample set was relatively small, the predictive nature of the data indicates that for each additional year of building age, the TAAS All score would likely increase by .42 times the building age (TAAS All = .42 (Building Age).

Since the beta weight describes the relationship between the predictor and the criterion, these results indicate that building age influences student achievement.

This study indicates that, when trying to predict the achievement as measured by the TAAS test for disadvantaged students, building age and maintenance taken together are significantly predictive of achievement and explain 63 percent of the variability in the TAAS scores. Keeping in mind that the sample set is relatively small, this explanation of variability for building age is predictive. This predictive nature of the data suggests that for each additional year of building age and each additional state of maintenance, the TAAS Disadvantaged score could be the result of .62 times the building age minus .42 times the state of maintenance (TAAS Disadvantaged = .62(building age) - .42(state of maintenance). These results indicate that building age is positively related to the achievement of disadvantaged students yet school maintenance is negatively related to the achievement of disadvantaged students. Historically maintenance needs of older buildings are ongoing and costly. Mr. Soto pointed out that when a principal has to spend time trying to keep the plumbing and heating units working it distracts his attention from the instructional program. The ongoing demands for maintenance that older buildings require may also distract students.

When trying to predict the achievement as measured by the TAAS test for Hispanic students, building age accounts for 46 percent of the variability in the scores. The sample set is relatively small, but the regression results indicate a

fairly strong tendency. Theoretically for each additional year of building age, the TAAS Hispanic score would increase by .46 times the building age (TAAS All = .46 (building age). Since all the buildings used in this study were renovated, the age of the building may be a relative term.

When trying to predict the TAAS score over an eight-year period for all students, building age and school size taken together are predictive of achievement as measured by the TAAS test and account for 4.0 percent of the variability. While this percent of variance accounts for a fairly small percent of all the reasons why a student would receive a particular TAAS score, this explanation is extremely reliable and would happen five out of one hundred times by chance for building age ($p<.05$) and one out of ten thousand times for school size ($p<.0001$). For each additional year of building age, the student's TAAS score would likely be the result of an increase of .07 times building age minus .20 times school size (TAAS score = .07(building age) – .20(school size). These results indicate that over the eight year period between 1994 and 2001 building age positively influenced student TAAS scores and school size negatively influenced student TAAS scores.

This study supports and parallels Lanham's 1999 study where school size was found to be a significant predictor of student achievement. On the other hand, it differs from other studies concerning age of the building. Chan (1980), Edwards (1991), Cash (1993), Hines (1996) Earthman, Cash, and Van Berkum (1996) and

Lanham (1999) found building age to have a negative influence on student achievement. This study indicates that under certain circumstances students can make significant academic improvement in older buildings.

Conclusions

The conclusions of this single case study of the Ysleta Independent School District bolsters many previous research studies finding that improvement to facilities can positively influence student achievement (Edwards, 1991; Cash, 1993; Hines, 1996; Lemasters, 1997; Lanham, 1999) as well as the studies that suggest the achievement of economically disadvantaged students is affected by their environment (Kovol, 1991; Hines 1996). Further, this study supports previous research that points to school size as an important influence on student achievement (Cash, 1993; Hines, 1996; Lanham, 1999). This study also supports Hanson's 1992 findings that people are influenced and affected by their environment and McGuffey's 1982 findings that renovated and controlled environment facilities may enhance the learning process. The study supports research that points to renovation and construction as alternatives to new school facilities (Edwards, 1991; Kovol, 1991; Berner,1993). Finally this study supports research that suggests that renovated buildings send positive messages to students and that these positive messages contribute to their performance (Edwards, 1991).

This study of Tony Trujillo's service as the superintendent of the Ysleta Independent School District supports research connecting high-performing Texas school districts with dynamic superintendents (Rgaland, Asera, & Johnson,1998) and offers an example of visionary leadership. This study differs from previous research on facilities and student achievement in that it represents research that focused on one particular district with substantial student achievement improvements following the inclusion of renovation and repair to existing school facilities as part of the district's student achievement initiative. The study suggests that while almost seventy percent of the buildings in this study are at least thirty years old, over an eight-year period from 1994-2001 the variance in TAAS achievement could be explained by building age.

Eighty-eight percent of the students in the Ysleta Independent School District are Hispanic. Three percent of the student population is a combination of African American, Asian and Native American students and less than nine percent of the students are white. An overwhelming 73 percent of the students attending the Ysleta schools are classified by the Texas Education Agency as economically disadvantaged and yet almost 83 percent of these economically disadvantaged students passed all their TAAS subtests and 85 percent of all students passed their TAAS subtests in 2001. Why are so many students passing?

Certainly good teaching played a major part in these dramatic statistics and a well-defined vertically aligned curriculum was essential. Further, leadership and

vision by the superintendent and his staff helped point the way and remove the barriers but this study reveals that the age of the building when combined with maintenance, cleanliness and school size provides a partial explanation for the difference in student achievement on the 2001 Texas Assessment Of Academic Skills Test and for the change in their scores over an eight year period from 1994-2001.

Sixty-nine percent of the schools in the study are over thirty years old, and only two schools were less than ten years old. These statistics place the schools in this study within the range of the General Accounting Office report of 1995 that stated over half of America's school-aged children attend class in aging buildings over thirty years old. Since previous studies indicate that aging buildings contribute in a negative way to student achievement, what could explain the consistently positive results found in the Ysleta Independent School District?

During the spring of 1994, Tony Trujillo and the Ysleta ISD began an initiative to dramatically improve student achievement. One of the major components of that plan was the renovation and repair of Ysleta's aging buildings. Previous studies found that improving building conditions can positively influence student achievement; Ysleta improved their facilities and their scores are some of the highest in the state.

While the results of this study seem to contradict some previous findings concerning the impact of aging buildings, the documented gains in achievement by

all ethic and racial student groups within Ysleta regardless of their socio-economic status cannot be ignored. An analysis of the data in this study indicates that the age of renovated buildings helps explain positive gains in student achievement.

Implications

This case study has implications for the Ysleta ISD as they continue to face increasingly rigorous standards and accountability for student achievement along with the challenges of the budget constraints and shortfalls inherent in property poor districts. There are barriers that must be addressed.

1. Older buildings require ongoing and expensive maintenance. Since districts across Texas are forced to take money from the maintenance area and defer maintenance needs in order to balance their operating budgets each year, Ysleta's reliance on older renovated buildings may become a problem.
2. Outdated systems for electricity, heating, water, and air-conditioning often cause delays due to part ordering. Since building age and maintenance taken together are significantly predictive of achievement by disadvantaged students and account for 63 percent of the variability in their TAAS scores, the fact that

delays in maintenance are inherent in older buildings could be a problem.

3. Almost seventy percent of the schools in Ysleta quality for the aging building classification issued through the Federal General Accounting Office. Since outdated instructional designs result in problems with instructional flexibility, the Ysleta ISD will need funds for continued efforts regarding renovation of its older buildings. Restrictions by Texas concerning availability of funds could result in equity and access issues.
4. It is difficult at best to anticipate future budget needs of aging buildings. This is especially difficult for property poor districts due to their dependence on state programs. Since there is no state fund for emergency facility needs, delays and constrains may influence student achievement.

Clearly, properly renovated aging buildings commingled with quality teaching, aligned innovative curriculum, and visionary leaders make a difference in student achievement. For property poor districts, this difference is due in large part to state funding. State funding provides property poor districts with necessary funds but at the moment it comes with a price tag and with restrictions. Money from the Instructional Facility Allotment Fund is restricted to facilities used for instruction

and the word "instruction" is narrowly defined. Further, state and federal mandates for educational programs, environmental safety, and salary structure are seldom accompanied by the funds to implement them (Ferguson, 1991). This creates hardships for all Texas schools and additional barriers for property poor districts like Ysleta. Unless the facility improvements are directed toward instructionally used areas as defined by the Instructional Facility Allotment, the district must fund the building through other sources. For most property poor districts like Ysleta, there is no other source.

Students attending schools in property poor districts compete with and against students in wealthy districts. For teenagers, this competition reveals itself in high school through academic competitions won at local, state and national competitions, through the taking of a multitude of advanced placement courses and receiving a score of three or better on national tests, and through preparing for and taking standardized tests. Due to the increasing competition for scholarships and grants economically disadvantaged students find that academic success is not enough. They must compete in a variety of areas, one of which is on the athletic playing field. Students must show evidence that they were at least a member of academic and athletic teams throughout their high school career. It helps if those teams won coveted prizes and that the students played an important role in that victory. Couple this with the knowledge that to compete with students from affluent school districts for prized scholarships or freshman positions in

prestigious universities these economically disadvantaged students must record hundreds of hours of community service and perform in their high schools' plays and musical concerts. Lack of unrestricted funds places districts and ultimately students at a disadvantage because property poor districts do not have many of these needed facilities.

Blatant discrimination and denial of needed benefits for disadvantaged students would not be tolerated in Texas. Yet, some could argue that denial of access to certain school facilities is a form of discrimination (Edwards, 1991; Kovol, 1991). Mr. Soto told a story about two 2001 Ysleta soccer teams that advanced to the regional playoffs. Both teams had progressed easily to the playoffs handily beating every team they opposed. It was only when they reached the regional playoffs that Ysleta's inability to keep up with wealthy districts confronted the students. The regional playoffs were held in a district that used Astroturf fields. In fact, all the other districts competing at the playoffs had Astroturf fields. The Ysleta students' lacked experience on this new surface and it inhibited their play. As a result, both teams lost. Mr. Soto put it like this,

> The question is – Should the state tell us not to spend our money on Astroturf when our kids need to go and compete against kids that have it. Knowing that success on that level of competition is often how college scholarships are derived, where is the equity in that?

> When we talk about access and equity issues for children across Texas, you are talking about facilities.

This example underscores the narrow definition of instructional facilities set by Texas and the difficulty it causes students' already hampered by socio-economic disadvantages. School facility needs transcend classrooms and science labs. Many of the students in Ysleta need more than a decent education to attend college. They need scholarships. Some of these scholarships are in the form of academic grants and fellowships but many can be found through sports and extracurricular activities. Since the Instructional Facility Allotment Fund's definition of instruction is narrowly defined to the classroom, the students in districts like Ysleta often miss out on opportunities because of the lack of equity afforded by lack of funding.

Limitations

The complexity of learning and the system of education limit this study, and the relatively narrow scope of this research results in de-limitations. This district was purposely chosen due to its success with student achievement. While this case study of the Ysleta Independent School District identified possible influences on student achievement, it was limited by its relatively small sample

size and cannot conclude that school facility conditions alone result in, lead to or cause student achievement. Further, the results of this study, while interesting, cannot be generalized. This school district was purposely chosen due to its success in improving student achievement from low performing to recognized based on its students' TAAS test results. The qualitative part of this study tells the story of what happened in Ysleta, while the quantitative part suggests why.

As with any survey study, the reliability of the survey results depends on the quality of the survey and the person filling out the form. This study would be enhanced had a question been included on the survey regarding the specific date the building was placed into service and the specific dates renovation and updates were performed at the school. Further, specific information regarding the scope of the renovation and updates would have added to the study. Further, although principals are the decision makers for their buildings, the expertise of those filling out the survey must always be a concern. The value of this research is that while it cannot establish a causal relationship with any degree of certainty between the condition of school facilities and student achievement it can explain a percent of the variance and provide important information regarding possible barriers to successful student achievement.

Recommendations for Further Study

Unfortunately for students, there is no student achievement checklist that if followed will guarantee success. There is neither a magic leadership formula nor a model of teaching that if followed consistently results in high achievers. There is no genetic blueprint, guidelines to prenatal care, description of family structure, level of socioeconomic status or steps for child development that will consistently result in a well-educated successful student. There is no funding package or mandated law that will assure that students will achieve to his or her potential. Finally, there is no educational kit containing a building, atmosphere, classrooms, equipment, and staff that if purchased can guarantee student achievement. Successful efforts to improve student achievement are targeted, complex, intermingled, systemic and mystical. Superior curriculum, innovative instruction, visionary leadership and improved measures of student achievement as well as the money it takes to provide them are necessary but the buildings that house Texas' future cannot be ignored.

1. Districts must improve the questions they ask themselves concerning their educational process. They must keep specific ongoing records and practice data driven instruction. Specifically, districts across Texas should investigate the influence their facilities have on their students' achievement.

2. This study could be replicated in Ysleta to include the remainder of schools in the district. Results could be used to strengthen decisions concerning future renovation and repair to Ysleta's school facilities. Further, results that point to an influence regarding positive gains in student achievement could be used with other bolstering research to secure possible grants, bonds and special funding.
3. This study could be replicated in other districts across Texas. With the change from TAAS to TEKS, information influencing growth in student achievement is important. Studies must be conducted using TEKS as the criterion.
4. Consideration must be given to establishing statewide building standards and a survey questionnaire that reflects them.
5. Additionally, contractors, educators and lawmakers need to be trained to identify and maintain shared school facility standards.
6. This study with changes could be repeated in other states. The survey instrument could be modified to include the state's building standards. Since there is no national standard for student achievement, states would need to design an instrument that meets their specific standards for achievement.
7. Questions should be asked of lawmakers concerning equity and access with regard to school facilities. This study supports that school facilities

influence student achievement in the Ysleta Independent School District. If property poor districts are hampered by state funding laws in their attempts to improve student achievement. Questions regarding the constitutionality of Texas school funding seem to exist.

Tony Trujillo said the building initiative "was a physical demonstration to people in the community that they need not settle for second class anything. And that if we are going to have great buildings, we are going to have a great education inside those buildings. My theory is that the environment surrounding people has a great deal to do with their attitudes about everything about themselves." The Ysleta Independent School District dramatically improved their students' achievement. This study indicates that the condition of their school facilities accounts for part of that achievement. Further, debate concerning facility infrastructure and the role state and Federal governments will play in facility funding continues. Information that might shed light on their connection is noteworthy and important.

Appendix A

Ysleta Independent School District Superintendent Interview Questions

The interview will be non-fixed and generally follow the questions below.

1. Generally speaking what were the demographics of the Ysleta ISD district 10 years ago? Have they changed?
2. What prompted the district to originally include improvements to the Ysleta ISD's school facilities in their district goals?
3. What role did the conditions and quality of the Ysleta ISD facilities play in keeping students and attracting others? What is that role now?
3. Do the stakeholders in the Ysleta ISD *generally* believe that the conditions and availability of Educational facilities affect the level of academic performance?
4. How do the stakeholders in the Ysleta ISD see the conditions and availability of the Educational facilities?
5. How did the Ysleta ISD finance the original improvements to the facilities?
6. How does the district finance the ongoing maintenance of the facilities?
7. Is the Ysleta ISD access to the Facility Allotment Fund adequate?
8. What other funds are used?

9. Is there a more appropriate way to finance improvements and maintenance?
10. Do you feel the improvements to the Ysleta facilities contributed to the rise in TAAS scores?
11. Do you have any comments regarding the possible relationship between building conditions and student achievement?
12. What changes would you like to see regarding availability of funds for improvement and maintenance of school facilities?
13. Are there any areas that you feel require further comment?

Appendix B

IRB#_____

Informed Consent to Participate in Research
The University of Texas at Austin

You are being asked to participate in a research study. This form provides you with information about the study. The Principal Investigator (the person in charge of this research) or her representative will also describe this study to you and answer all of your questions. Please read the information below and ask questions about anything you don't understand before deciding whether or not to take part. Your participation is entirely voluntary and you can refuse to participate without penalty or loss of benefits to which you are otherwise entitled.

Title of Research Study:
A Study of the Effect School Facility Conditions Have on Student Achievement

Principal Investigator and Telephone Numbers:

Principal Investigator, Susan Lair – with The University of Texas at Austin

Faculty Sponsor, Dr. Don Phelps – with Office of College Educational Administration at The University of Texas at Austin

Funding source:

Susan Lair funds this project.

What is the purpose of this study?

The purpose is to shed light on the effects building conditions have on student achievement.

What will be done if you take part in this research study?

You will receive a questionnaire. The questionnaire takes about 20 minutes to fill out. You will return the questionnaire to Susan Lair and the information will be

used in conjunction with TAAS scores over the last 10 years to determine the effect school facilities may have on student achievement.

What are the possible discomforts and risks?

The only discomfort is the time it will take to fill out the questionnaire. There may be risks that are unknown at this time. If you wish to discuss the information above or any other risks you may experience, you may ask questions now or call Susan Lair at the numbers listed above.

What are the possible benefits to you and to others?

Shedding light on any barrier to student success benefits educators. There are no direct benefits to you by this study.

If you choose to take part in this study will it cost you anything?

No, it will cost you nothing.

Will you receive compensation for your participation in this study?

No, you will not receive compensation.

What if you are injured because of the study?

There is virtually no likelihood of injury due to this study. No treatment will be provided for research related injury and no payment can be provided in the event of a medical problem.

If you do not want to take part in this study, what other options are available to you?

Participation in this study is entirely voluntary. You are free to refuse to be in the study, and your refusal will not influence current or future relationships with The University of Texas at Austin or the Ysletta Independent School District.

How can you withdraw from this research study?

If you wish to stop your participation in this research study for any reason, you should contact the Office of Education Administration. You are free to withdraw

your consent and stop participation in this research study at any time without penalty or loss of benefits for which you may be entitled. Throughout the study, the researchers will notify you of new information that may become available and that might affect your decision to remain in the study. In addition, if you have questions about your rights as a research participant, please contact, Clarke A. Burnham, Ph.D., Chair, The University of Texas at Austin Institutional Review Board for the Protection of Human Subjects.

How will your privacy and the confidentiality of your research records be protected?

Authorized persons form The University of Texas at Austin and the Instructional Review Board have the legal right to review your research records and will protect the confidentiality of those records to the extent permitted by the law. If the research project is sponsored then the sponsor also has the legal right to review your research records. Otherwise, your research records will not be released without your consent unless required by law or a court order.

If the results of this research are published or presented at scientific meetings, your identity will not be disclosed.

If you are interviewed:

a. The interview or session will be audio taped.
b. The cassettes will be coded so that no personally identifying information is visible on them.
c. They will be heard or viewed only for research purposed by the investigator and his or her associates.
d. The audio recordings may be retained for possible future analysis.

Will the researchers benefit from your participation in this study?

There will be no benefit beyond publishing or presenting the results.

Signatures:

As a representative of this study, I have explained the purpose, the procedures, the benefits, and the risks that are involved in this research study:

Signature and printed name of person obtaining consent Date

You have been informed about this study's purpose, procedures, possible benefits and risks, and you have received a coy of this Form. You have been given the opportunity to ask questions before you sign, and you have been told that you can ask other questions at any time. You voluntarily agree to participate in this study. By signing this form, you are not waiving any of your legal rights.

Printed Name of Subject Date

Signature of Subject Date

Signature of Principal Investigator Date

If you were interviewed,

I hereby give permission for the audiotape made for this research study to e also used for educational purposes.

Signature of Subject Date

We may wish to present some of the tapes from this study at scientific conventions or as demonstrations in classrooms. Please sign below if you are willing to allow us to do so with the tape of your interview.

Signature of Subject Date

Appendix C

Ysletta Independent School District
Facility Questionnaire

Position with District

_____Principal _____Other "_____"
Specify

Respondent Name *optional* _____

1. **The demographics of my district may be generally described as:**
Check all that apply

_____ Seniors/empty nesters
_____ "normal mix"
_____ rural
_____ stable
_____ in transition
_____ new subdivisions
_____ multi-family
_____ poor
_____ wealthy
_____ young families & singles
_____ urban
_____ suburban
_____ highly mobile
_____ re-developing
_____ older neighborhoods
_____ single family
_____ middle-class
_____ mixed income

Comments:
_____
_____

I. STRUCTURE

2. **What is the age of your facility?**

A facility's age is your best estimate of the time period during which most of the space used by students was built. If the space was fully updated to the building standards of a later time period, consider the school in the later time period.

a. 60 years old or older
b. 50-59 years old
c. 40-49 years old
d. 30-39 years old

e. 20-29 years old
f. 10-19 years old
g. Under 10 years old

Comments:

_____

_____

3. If there are windows in the instructional areas, how many windows are in an external wall?

a. less than 1/4 of the instructional areas.
b. at least 1/4, but fewer than _ of the instructional areas.
c. at least 3/4 of the instructional areas.

Comments: Comments:

_____

_____

4. Does the school's air system provide clean/quality air?

a. Yes
b. No

Comments:

_____

_____

5. Is the instructional area of the facility air-conditioned?

a. Yes
b. No

Comments:

_____

_____

6. Are the classrooms individually heat controlled?

c. Yes
d. No

Comments:

_____

_____

7. What type of flooring is found in the instructional areas?

e. Wood floors
f. Tile or Terrazzo

g. Carpet

Comments:

_____

_____

8. What is the configuration or make-up of the interior ceilings?

a. Wood or beams

b. Plaster or acoustical tiles in at least 3/4 of the instructional areas

c. Acoustical tiles throughout the instructional areas

Comments:

_____

_____

9. What is the light source?

a. Incandescent Lighting

b. Fluorescent Lighting

Comments:

_____

_____

10. Does the lighting in the classroom provide adequate light?

a. Yes

b. No

Comments:

_____

_____

11. What color are the walls in the instructional areas?

a. Dark colors

b. White

c. Pastel colors

Comments:

_____

_____

12. What is the condition of the classroom furniture?

a. Most rooms have furniture that is either facially scarred or damaged.

b. Though the rooms may have some minor facial scars on the student desks, all the furniture is sound and looks satisfactory.

c. All of the classrooms have furniture that is functionally sound and attractive.

Comments:

_____

_____

13. Please indicate which utilities or equipment are available and in usable condition in the science labs (Please circle all that apply)

a. Gas
b. Water
c. Sinks
d. Electricity

Comments:

_____

_____

14. How long ago was science equipment updated to district standards?

a. Over 10 years ago
b. Between 5 and 10 years ago
c. Less than 5 years ago (or) the building is less than 5 years old.

Comments:

_____

_____

15. Are there enough classrooms to accommodate the existing education program within your regular building?

a. Yes
b. No

Comments:

_____

_____

16. Is the facility located near a busy highway, a frequently used rail line, an area where aircraft frequently pass overhead, or any other loud noise-producing environment?

a. Yes, and no measures have been taken to reduce the level of noise within the facility.

b. Yes, but measures have been taken to reduce the level of noise within the facility
c. No

Comments:

_____

_____

II. MAINTENANCE

17. What is the condition of the school's landscape?

a. There is no landscaping, and sidewalks are either not present or damaged (it is unattractive to the community).
b. There is landscaping and the sidewalks are present and in good repair (it is acceptable to the community).
c. The landscaping and other outside facilities are attractive and well maintained (it is a center of pride for the community).

Comments:

_____

_____

18. What is the condition of the student's academic lockers?

a. Most are not functional or not in good repair
b. At least 3/4 of the lockers are functional and in good repair
c. Over _ of the lockers are functional and in good repair

Comments:

_____

_____

19. Can the windows be opened and closed manually?

a. Yes
b. No

Comments:

_____

_____

20. Is the flooring maintained in good condition?

a. Yes
b. No

Comments:

_____

_____

21. Are the ceiling clean and without stains?

a. Yes
b. No

Comments:

_____

_____

22. Please give the time interval of interior painting?

a. Over 15 years ago
b. Between 8 and 15 years ago
c. Less than 8 years ago

Comments:

_____

_____

23. Please give the time interval of exterior painting?

a. Over 7 years ago
b. Between 4 and 7 years
c. Within the last 4 years (or) no exterior surface requires periodic painting

Comments:

_____

_____

24. Please indicate evidence of a roof leak?

a. Ceiling is deteriorating due to water damage, and/or water falls in some areas of facility requiring buckets for water collection.
b. Ceiling is currently developing a few new stains due to minor leaks.
c. No visible signs, or only a few old water spots in ceiling.

Comments:

_____

_____

25. Is the number of maintenance staff adequate for your building?

a. Yes
b. No

Comments:

_____

_____

26. Are maintenance problems solved in a timely manner?

a. Yes
b. No

Comments:

_____

_____

27. Please consider the overall condition of your school facility structure. Is it -

a. Below standard
b. Standard
c. Above standard

Comments:

_____

_____

III. HOUSEKEEPING

28. How often are the instructional area floors cleaned?

a. Monthly
b. Weekly
c. Daily or more frequently

Comments:

_____

_____

29. How often are the instructional floors maintained (waxed, mopped, stripped and waxed?

a. Annually
b. Monthly
c. Weekly or Daily

Comments:

_____

_____

30. Is graffiti commonly found on the premises? Circle Yes or No for each listed area.

a.	Bathrooms	Yes	No
b.	Lockers	Yes	No
c.	Hallways	Yes	No
d.	Classroom Walls/Doors	Yes	No
e.	Other Interior Surfaces	Yes	No

Please Specify

_____

f. Exterior walls Yes No
g. Exterior Walkways Yes No
h. Other Exterior Surfaces Yes No

Please Specify

_____

Comments:

_____

_____

31. How long does the graffiti remain before it is removed?

a. Until summer maintenance or the next painting cycle
b. More than a week, less than a month
c. Less than a week (or) no to all parts of #12

Comments:

_____

_____

32. Are the walls in the instructional areas clean and in good condition?

a. Yes
b. No

Comments:

_____

_____

33. Do you consider the general appearance of your building/classroom adequate?

a. Yes
b. No

Comments:

_____

_____

34. Are hallways kept clean during the day?

a. Yes
b. No

Comments:

_____

_____

35. How would you describe the interior smell?

a. Pleasant
b. Disturbing

Comments:

_____

_____

36. Is the housekeeping staff during the school day adequate?

a. Yes
b. No

Comments:

_____

_____

37. What do you consider to be the overall condition of your facility cosmetically?

a. Below standard
b. Standard
c. Above standard

Comments:

_____

_____

PLEASE PROVIDE THE FOLLOWING INFORMATION IF YOU CAN:

38. The conditions and quality of our school's facilities play what role in keeping students and attracting others:

_____ high _____ moderate _____ low

Comments:

_____

_____

39. The people in our school *generally* believe that the conditions and availability of educational facilities can affect the level of academic performance

_____ agree _____ disagree _____ opinion uncertain

Comments:

_____

_____

40. The stakeholders in our school believe that current conditions and availability of our educational facilities are a:

_____ positive _____ negative _____ no influence on academic performance

Comments:

_____

_____

41. What is the approximate gross square footage of your facility? (Use building's rough dimensions)

_____	X	_____	=	_____
Length		Width		Gross Sq. Ft.

42. What is the approximate acreage of your school site?

_____ Acreage

43. If there are any areas on this assessment instrument, which you feel require further comment, please note them and your comments in the space provided. Thank you for your time and assistance in completing this assessment of your facility's physical environment.

Comments:

44. **If you have any comments regarding the possible relationship between building condition and student achievement, please make them below**.

Comments:

This questionnaire was adapted from the *Commonwealth Assessment of Physical Environment* (CAPE)
in conjunction with studies directed by Cash (1993) and Hines (1996) in Virginia.

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VITA

Susan Brooks Lair was born in Fort Worth, Texas on November 25, 1950, to Eva Lou Brooks and Jesse Howard Brooks. After graduating from Paschal High School, Fort Worth, Texas in 1968, Susan attended the University of North Texas and graduated with a Bachelor of Science degree in 1972, with a concentration in mathematics and physical education. After five years of teaching in the Fort Worth Independent School District, she moved with her husband and two daughters to Bryan, Texas, where she became the chairman of the mathematics department for the Bryan ISD. In 1979, she returned to Fort Worth, Texas and worked as a mathematics specialist for the Fort Worth ISD. In 1982, she returned to teaching, and in 1990, enrolled in the Graduate School of Texas Christian University. In 1993, Susan was awarded a Master of Math Education degree. From 1995 until 2001, she was employed as the Head of the Upper School at Saint Mary's Hall, San Antonio, Texas. She was accepted into the Cooperative Superintendency Program at the University of Texas in Austin, Texas in 1999. Susan currently serves as the Head of School at St. Francis Episcopal Day School in Houston.

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