THE SCHOOL REFORM MOVEMENT AND HIGH STAKES STANDARDIZED TESTING: AN ANALYSIS OF FACTORS IMPACTING THE ACADEMIC OUTCOMES OF STUDENTS WHO RECEIVE SPECIAL EDUCATION SERVICES

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The purpose of this study was to investigate special education outcomes in relation to state standardized testing. It specifically sought to determine if a relationship existed between selected data from the Texas Academic Excellence Indicator System (AEIS) comparing district students receiving special education services TAAS scores with selected district demographic, fiscal, and special education data. The population for this study consisted of all 2001-2002 grades 3-8 and 10 public school students with the exception of charter schools, special-purpose statutory districts, and state-administered districts. The reading analysis incorporated data from 896 Texas school districts. The mathematics analysis used data from 914 school districts. Multiple linear hierarchical regression was chosen as the method for statistical analysis. Data was obtained from the Texas Education Agency (TEA) as a special data pull. For both the reading and mathematics analyses, wealth and ethnicity were statistically insignificant although ethnicity individually accounted for a large percentage of the variance for both the reading (20.3%) and mathematics (13.2%) scores as well as producing negative β weights. All other predictor variables produced varying degrees of statistical significance. Community type, socioeconomic status, instructional expenditures per students, and instructional expenditures per student receiving special education services also produced negative β weights. Two variables in this study, enrollment and the percentage of students receiving special education services tested, produced

positive β weights, substantial squared structure coefficients, and positive Pearson correlation coefficients. Of these two predictors, the strongest overall positive predictor for students receiving special education services success on the grades 3-8 and 10 reading and mathematics TAAS exams was the percentage of students receiving special education services tested. These percentages produced the largest positive correlations with passing rates (reading r = .283, mathematics r = .219) and the second largest regression coefficients (reading β = .224, mathematics β = .202). They individually accounted for the largest percentage of total criterion variance (reading = 33.0%, mathematics = 22.6%). For this study, these results clearly suggested that the dominant positive predictor of testing success for students receiving special education services was the percentage of students receiving special education services tested. Conversely, socioeconomic status was the dominant negative predictor.

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CHAPTER 1

INTRODUCTION

Background

The last ten years were a period of dynamic change in elementary and secondary education. Federal education initiatives and growing public dissatisfaction over the present state of schooling challenged our traditional notions of educational policy and practice. Accountability systems, standards, student achievement, and funding became major areas of change (Erickson, 1998). In this chapter accountability and high stakes standardized testing will be reviewed. Specifically, this study sought to explore if a statistically significant relationship existed between selected data from the Texas Academic Excellence Indicator System (AEIS). A rationale for the study and problems specific to the study will be proposed. Finally, a summary of the process and organization of the research will be presented.

Today's schools and communities are very different from those of two to three decades ago (McLaughlin, 1998). Family and community culture became much more diverse, creating new expectations and demands on schools. From within schools, new curriculum and approaches to pedagogy altered the way teachers teach. New governance structures also placed more responsibility and authority in the school. This accountability manifested itself in an increase in locally-controlled operations and externally-imposed expectations (Erickson, 1998). Policy-makers, business leaders, parents, and citizens called for accountability for student learning. The lexicon of American education began to include words such as standards, authentic assessment, and high stakes accountability (McLaughlin, 1998).

One reason for this trend may have been the considerable public investment in education programs (Parrish, 2001). In the last 25 years, spending on schools had increased 61% in real dollars (Bracey, 1997). According to Parrish (2001), total federal, state, and local expenditures on special education programs and services alone was estimated to be $32 billion dollars. In Texas, for the 1998-1999 school year, $1.5 billion in federal and state money was allocated for special education (TEA, 81767). Even with these figures, only 5% of adults in the United States believed that too much was spent (Elam, Rose, & Gallup, 1996). This echoed the sentiment of the Supreme Court in a decision from 1972. The court in *Mills v. Board of Education of the District of Columbia* (1972) addressed the issue of financing the education of all children regardless of disability. They found that insufficient funding was no excuse for denying students receiving special education services a Free Appropriate Public Education (FAPE). Denying special education services was, and continued to be, legally indefensible from a fiscal standpoint (Verstegen, 1994).

Ensuring that all students met the same high standards became paramount to the economic arguments associated with the systemic reform that developed in public schools (McLaughlin, 1998). A consistent problem of guaranteeing these high standards and the associated accountability had been the wide disparity of resources between schools within districts and between school districts. Initially the accountability focused on special education inputs and processes (Erickson, 1998). The standards movement shifted this focus from an emphasis on what had been taught to what had been learned (Wren, 2002). A cursory examination of two Supreme Court cases highlighted this transition in the context of special education.

The Supreme Court, in 1982, issued its first special education decision with *Board of Education v. Rowley* (1982). The Court ruled that the Education *for All Handicapped Children Act of 1975 (EAHCA)* intent was to provide access to public education by means of specialized services, not to guarantee a particular substantive level of academic achievement. In 1993, the degree of educational benefit was also addressed by the Court. An in depth investigation of *Florence County School District Four v. Shannon Carter* (1993) suggested the need for a maximization of benefit. Further statutory changes also indicated a policy shift emphasizing educational outcomes or results.

Statutorily, this shift or reform manifested itself in the *Individuals with Disabilities Education Act Amendments of 1997 (IDEA 97)*. The congressional findings and purpose section of the act suggested that since the enactment and implementation of the *EAHCA* there had been success in improving educational results for children with disabilities by providing these children with access to a FAPE (P.L. 103-117). A stated caveat, in this congressional findings and purpose section, was that the implementation of the *EAHCA* had been shortchanged by low expectations for the special education student. Initially the statute was concerned with access and equity, but the emphasis had shifted to some definition of successful academic progress for the special education student.

IDEA 97 provided a mandate for success with specific requirements to include all children in state- and district-wide standardized assessment. This was not just for participation but attempted to improve access to and success in the general curriculum. Also, Section 504 of the *Rehabilitation Act of 1973*, Title II of the *Americans with*

Disabilities Act of 1990 (ADA), and Title I of the *Elementary and Secondary Education Act (Title I)* contained provisions for this requirement. In an August 24, 2000, memorandum to the State Directors of Special Education, the Assistant Secretary of the Office of Special Education and Rehabilitative Services Judith Heumann reiterated and supported the mandate to include all children in educational accountability systems. She articulated the posturing that assessment, in and of itself, provided information that was of direct benefits to the student. The benefit was the measure of individual progress against some standard (Wright, 1999).

Up to now, few courts had insisted that special education systems deliver an adequate educational program (Verstegen, 1998). Research and experience demonstrated that the education of students with disabilities could be made more effective by having high expectations and promoting success in the general curriculum to the maximum extent possible (20 U.S.C. § 1406 (c)(5)(A)). It had also been suggested that future litigation would focus more and more on programs that had relatively low expectations for children with disabilities (Wright, 1999).

As of April 2000, 20 states required children to pass a uniform exit examination to receive a high school diploma. Federal and state laws mandated the inclusion of all children in this testing. The *Goals 2000: Educate America Act* (P.L. 103-227) as well as Title I of the *Improving America's Schools Act of 1994* (P.L. 103-328) required that these assessment included all students especially those with diverse learning needs and disabilities (O'Neill, 2000). This requirement was also based on Section 504 of the *Rehabilitation Act of 1973* and Title II of the *Americans with Disabilities Act of 1990* (Heumann, 2000). The *No Child Left Behind Act of 2002* continued the demand for high

expectations in regards to students with disabilities (U.S. Department of Education, 2002).

IDEA 97 required states to enact policies and procedures which allowed students with disabilities to take part in regular state and district-wide standardized testing programs (P.L. 105-17). The student with disabilities, working below grade level, was to be included in standardized testing programs through the use of State Developed Alternative Assessments (SDAA). States also developed guidelines for students whose disabilities were so severe that, to be included in standardized testing programs, they might need to participate in Locally Developed Alternative Assessments (LDAA) (O'Neill, 2000).

The successful education of students with disabilities had been dominated by the accountability aspects that were tied to high stakes standardized testing and the mandate to include special education students in this testing. The prospect of future special education litigation centering on low expectations, the rising cost of providing public education, the disparities in resources, and the demographic differences between schools within districts and between school districts had intensified this focus. Rodi (2000) suggested that an investigation of the successful education of students with disabilities could appropriately be applied to special education if there were some standard against which special education programs could be measured. In the Rodi paper, the *Individualized Education Plan (IEP)* document was used as the measurement standard. With the advent of high stakes standardized testing and the associated accountability system, another standard of measurement has been provided.

There continued to be discussion regarding the use of high stakes standardized testing, but the practice became firmly rooted in the fabric of public education. In Texas, the Texas Assessment of Academic Skills (TAAS) exam, despite conflicting policy positions regarding the appropriateness of high-stakes standardized testing, had been referenced in legal proceedings and influenced litigation. Academic recognition on third and fourth grade TAAS exams was cited as evidence by the hearing officer's decision in *Kayla S. v. George West I.S.D* (2001). This evidence weighed heavily in the determination of whether or not a student was in need of special education services. In this ruling, it was found that a child with a permanent hearing impairment was not a student in need of special education services. The child had been successful in regular mainstream classes and received accommodations under Section 504 of the *Rehabilitation Act*.

In *Robert P. v. Northside* ISD (2002), the TAAS again was referenced in a special education hearing officer's decision. The fact that a student mastered the educational goals set out in his *IEP*, passed his classes, and scored well on the TAAS exam resulted in a ruling that the ARD committee properly dismissed the student from special education.

The federal district court in *Austin I.S.D. v. Robert M.* (2001) also used achievement on the TAAS exam to infer that a student alone had been responsible for his poor academic performance. It was the opinion of the court that schools were not required to force, motivate, or spoon-feed students to maximize their potential. Schools were required only to offer a program that was reasonably calculated to confer

educational benefit. In this case, the school had clearly fulfilled this requirement as evidenced by academic distinctions on a tenth grade TAAS exam.

The 76th Session of the Texas Legislature, in 1999, passed Senate Bill 103 (TEA Technical Digest, 2001). Reading was the initial emphasis of the bill and would be assessed at each of the grade levels 3 through 9. The 76th legislature, as part of the Student Success Initiative and complementing Senate Bill 103, also passed Senate Bill 4 (Nelson, 2000). This bill made sweeping changes to student promotion requirements. Satisfactory performance on the grade 3 reading assessment, the grade 5 reading and mathematics assessment, and the grade 8 reading and mathematics assessment would be required for grade promotion. This law impacted the kindergarten class of 1999.

Rationale for the Study

For this study, the TAAS exam and legislation provided a rationale for the examination of factors that might be suggested as impacting the academic outcomes of students receiving special education services. The intent of this research was to focus on the 2001-2002 grades 3-8 and 10 reading and mathematics TAAS exams with a specific emphasis on the inclusion of special education students in the testing process. This was the most recent AEIS data set available, at the time of this study, with the associated district accountability rankings and sanctions imposed. These were also the only two exams given yearly at the 3-8 and 10 grade levels. If current mandates remained in effect, these two exams would also impact grade placement when TAKS was fully implemented.

Problem Statement

The problem focused on determining what factors impact the academic outcomes of special education students in Texas. Passing rates on the 2001-2002 grades 3-8 and 10 reading and mathematics TAAS exams were used as criterion variables. Selected variables identified in the review of literature and prior research that have generally been accepted as impacting academic progress were used as predictor variables. These predictor variables were district community type, district enrollment, district socioeconomic status, district ethnicity, district instructional expenditures per student, district instructional expenditures per special education student, district wealth, district percentage of students in special education, district percentage of special education students taking the exam, and district special education analysis system rating.

Purpose of the Study

Public education experienced many initiatives or reforms while being subjected to higher program costs and public scrutiny at increasing levels. The central tenants of this reform were higher standards, public accountability for student achievement, equity of access to these high standards, and restructured systems. Parents, community members, government, and business leaders exerted pressure for greater accountability and higher levels of student achievement (McLaughlin, 1998).

The literature had not defined successful academic outcomes for the student receiving special education services. Additionally, there was no reliable data on the actual amount of money spent on special education or the resulting educational outcomes resulting (Parrish, O'Reilly, Duenas, & Wolman, 1997). It had not been

determined if resulting educational outcomes had a statistically significant relationship to expenditures (Cameron, 2000).

Our society established and evaluated policies and procedures whose goals were to promote meaningful life outcomes for students with disabilities. This brought special education and school reform to a crossroads. The intersection consisted of statewide accountability systems constructed from standards and assessments with far-reaching consequences for students, schools, and school districts (Erickson, 1998).

There had been research conducted to determine what factors were related to students with disabilities doing well when included in the high stakes standardized testing process. Predominately the studies investigated special education policy focusing on state or national level issues. There were also occasional examinations of specific student outcomes. There had been an abundance of studies that analyzed the achievement of all students. Fewer studies had been conducted that specifically addressed special education outcomes in relation to state standardized testing (Martin, Oliphint, and Weisenstein, 1994).

Research Questions

Research Question 1. Is there a relationship between the percentage of grades 3-8 and 10 students receiving special education services who pass the reading TAAS exam and district community type, district enrollment, district socioeconomic status, district ethnicity, district instructional expenditures per student, district instructional expenditures per student receiving special education services, district wealth, district percentage of students in special education, district percentage of students receiving

special education services taking the exam, and district special education analysis system rating?

Research Question 2. Is there a relationship between the percentage of grades 3-8 and 10 students receiving special education services who pass the mathematics TAAS exam and district community type, district enrollment, district socioeconomic status, district ethnicity, district instructional expenditures per student, district instructional expenditures per student receiving special education services, district wealth, district percentage of students in special education, district percentage of students receiving special education services taking the exam, and district special education analysis system rating?

Definition of Terms

Academic Excellence Indicator System (AEIS) - A report published annually that contains a wide range of both student performance information and demographic information on every public school district in the State of Texas. It is a database of indicators mandated by Texas statute to emphasize student achievement for purposes of accountability as well as recognition (Snapshot '02, p.411).

District community type - Districts are classified on a scale ranging from major urban to rural. Factors such as size, growth rates, student economic status, and proximity to urban areas are used to determine the appropriate group. The groups are: (a) major urban, (b) major suburban, (c) other central city, (d) other central city suburban, (e) independent town, (f) non-metro-fast growing, (g) non-metro-stable, (h) rural, and (i) charters. (Snapshot 02, p.32). Charter schools were excluded from the data set used in this study.

- *Major urban* - The largest school districts in the state which serve the six metropolitan areas of Houston, Dallas, San Antonio, Fort Worth, Austin, and El Paso. Major urban districts are the districts with the greatest membership in counties with populations of 650,000 or more and more than 35% of the students are identified as economically disadvantaged.
- *Major suburban* - Other school districts in and around the major urban areas. These major suburban districts are contiguous to major urban districts. If not contiguous, it must have a student population that is at least 15% of the size of the major urban districts.
- *Other central city* - These are major school districts in other large Texas cities. They are the largest districts in counties with populations between 100,000 and 650,000 and are not contiguous to any major urban districts.
- *Other central city suburban* - These school districts are in and around other large, but not major, Texas cities. Other central city suburban districts are generally contiguous to other central city districts. Suburban districts that are not contiguous must have a student population that is at least 15% of the size of the central city district to be included in this category.
- *Independent town* - These are the largest school districts in counties with populations of 25,000 to 100,000.
- *Non-metro: fast growing* - These are the school districts that fail to be in any of the above categories and exhibited a five-year growth rate of at least 20%. There must be at least 300 students in membership in these districts.

- *Non-metro: stable* - The school districts that fail to be in any of the above categories, but the number of students in membership exceeds the state median.
- *Rural* - This is a school district that fails all of the above tests for placement into a category. The growth rate is less than 20%, and the number of students in membership is either between 300 and the state median or the number of students in membership is less than 300.

District Data Analysis System (DAS) Rating - The predictor variable District Data Analysis System (DAS) rating is a numerical (1-8) assignment indicating a district's special education compliance status (SpECS). One (1) is the best rating obtainable (*compliant*) with eight (8) the most non-compliant status (*sanctions imposed*). These ratings follow:

- *Desk Audit: Compliant* 1
- *Desk Audit: Self-Evaluation Required* 2
- *Desk Audit: Site Visit Pending* 3
- *Site Visit: Compliant* 4
- *Site-Visit: Corrective Action Compliant* 5
- *Site-Visit: Corrective Action Required (Under Review by TEA)* 6
- *Site-Visit: Corrective Action Required (Unresolved)* 7
- *Sanctions Imposed* 8

District demographic variables - These are a group of criterion variables to be analyzed in the study and include district community type, district enrollment, district socioeconomic status, and district ethnicity.

District enrollment - Districts are grouped by size into nine categories based on the number of students in membership. This is the total number of students in membership in the district on a day in late October. It does not include students who are served by the district but who are not in membership. The membership groups are; (a) under 500, (b) 500 to 999, (c) 1,000 to 1,599, (d) 1,600 to 2,999, (e) 3,000 to 4,999, (f) 5,000 to 9,999, (g) 10,000 to 24,999, (h) 25,000 to 49,999, and (i) 50,000 plus (Snapshot 02, p.32). For this study, actual enrollment and not the categories will be used.

District ethnicity - This is the percentage of students by district who are African-American, Hispanic, White, Asian/Pacific Islander, or Native American. Asian/Pacific Islander and Native American students are grouped as % Other (Snapshot ’02, pp.400-401). For the purposes of this study, district ethnicity will be defined as each districts’ total percentage of minority students.

District fiscal variables - These are a group of criterion variables to be analyzed in the study and include district instructional expenditures per pupil, district instructional expenditures per special education student, and district wealth.

District instructional expenditures per pupil - Percent instruction is the percentage of total expenditures budgeted for instruction in the district. Instructional expenditures include all activities dealing directly with the interaction between teachers and students such as instruction aided with computers. Percent instruction also includes expenditures to provide resources for juvenile justice alternative education programs (JJAEPs) (Snapshot ’02, p. 407). The predictor variable district instructional expenditures per

student are regular education budgeted instructional expenditures, for all students and student groups, divided by total students (Snapshot ’02, p.408).

District instructional expenditures per special education student - Total instructional expenditures for special education are listed in Texas Education Agency (TEA) data as percent Special Education. It is expressed as a percent of total instructional expenditures (Snapshot ’02, p. 408). District instructional expenditures per special education student was the data set required for this study and will be percent Special Education (total instructional expenditures for special education students) divided by the number of special education students in the district.

District percentage of Grades 3-8 and 10 special education students taking the Reading TAAS Exam - The predictor variable district percentage of grades 3-8 and 10 special education students taking the reading TAAS exam is not defined specifically in the Snapshot Item Definitions but will be the number of grades 3-8 and 10 special education students participating in the administration of the reading TAAS exam (TEA data variable DSOTRO2D) divided by the total number of grades 3-8 and 10 special education students (TEA data variable ENROLL3810).

District percentage of Grades 3-8 and 10 special education students taking the Mathematics TAAS Exam - The predictor variable district percentage of grades 3-8 and 10 special education students taking the mathematics TAAS exam is not defined specifically in the Snapshot Item Definitions but will be the number of grades 3-8 and 10 special education students participating in the administration of the mathematics TAAS exam (TEA data variable DSOTMO2D) divided by the total number of grades 3-8 and 10 special education students (TEA data variable ENROLL3810).

District percentage of students in special education - The predictor variable district percentage of students in special education is listed as percent Special Education. These are the students identified as participating in programs for students with disabilities expressed as a percent of total students. Students are placed in special education by their Admission, Review, and Dismissal (ARD) committee (Snapshot ’02, p.401).

District socioeconomic status - This is the percentage of students reported as economically disadvantaged. Economically disadvantaged students are those who are reported as eligible for free or reduced-priced meals under the National School Lunch and Child Nutrition Program, or other public assistance (Snapshot ’02, p.401).

District special education demographic variables - These are a group of criterion variables to be analyzed in the study and include district percentage of special education students, district percentage of special education students taking the grades 3-8 and 10 reading TAAS exam, district percentage of special education students taking the grades 3-8 and 10 mathematics TAAS exam, and the district special education data analysis system rating.

District wealth - The predictor variable district wealth is property wealth also referred to as taxable value per pupil. It is the district’s total taxable property value in 2001 divided by the total number of students in the district in 2001-2002 (Snapshot ’02, p.406). The property value reported in Snapshot is the traditional measure of value, not the alternative value which may be used for state funding calculations. The traditional measure is defined as school district taxable value after the loss due to the additional $10,000 homestead exemption. Districts are classified into 20 categories with

approximately equal numbers of students in each, or approximately 5% of total students per category. The 186 non-taxing entities (180 charters and the six special statutory districts) form a separate group because they have no taxable property wealth (Snapshot '02, p.33). Charter and special statutory districts were excluded from this data set. In this study, the actual dollar value and not the categories were used (Snapshot '02, p.40).

Public Education Information Management System (PEIMS) - This is the primary means through which the Texas Education Agency collects information on schools and school district organizations, staff, students, and finances. This is data collected annually and compiled to produce a yearly AEIS report (Snapshot '02, p.414).

Special education demographics - For the purposes of this study these demographics will be the percentage of special education students in the district, percentage of grades 3-8 and 10 special education students participating in the regular reading TAAS exam, percentage of grades 3-8 and 10 special education students participating in the regular mathematics TAAS exam, and special education district data analysis system rating.

Texas Education Agency - The Texas Education Agency (TEA) is comprised of the commissioner of education and agency staff. The TEA and the State Board of Education (SBOE) guide and monitor activities and programs related to public education in Texas. The TEA is the administrative unit for primary and secondary public education. Under the management of the commissioner of education, the TEA manages the textbook adoption process; oversees development of the statewide curriculum; administers the statewide assessment program; administers a data collection system on

public school students, staff, and finances; rates school districts under the statewide accountability system; operates research and information programs; monitors for compliance with federal and state guidelines; and serves as a fiscal agent for the distribution of state and federal funds (Snapshot '02, p.2).

Texas Assessment of Academic Skills (TAAS) - The yearly state-mandated assessment given in grades 3-8 and 10.

Texas Assessment of Knowledge and Skills (TAKS) - The Texas Assessment of Knowledge and Skills (TAKS) replaced the TAAS in the 2002-2003 school year as the state-administered assessment. AEIS reports prior to 2002-2003 show performance on the TAAS test (TEA).

Limitations

Several factors were identified as possible limitations to this particular study. Correlations obtained in the study do not establish causal relationships among the variables. Additionally, information gathered from PEIMS depends on accurate information being provided by each school district to the Texas Education Agency (TEA). Another limitation concerned special education per-pupil expenditures. These expenditures were for all students receiving special education services whether the student did or did not participated in the regular TAAS testing program. In using per pupil expenditures, it also cannot be guaranteed that the same dollar would buy the same educational inputs in one school system as it would in another even with districts having similar demographics. In regards to high stakes standardized testing, It should also be noted that the *IDEA 97* required that students receiving special education services be included in this type of assessment. There has been a relatively short

period of time where the results of students receiving special education services have been included in the determination of the campus and district accountability ratings. Because of this limited time, results may or may not be representative of special education in future years. As a final limitation, generalizations from this study are not necessarily related to all states.

Delimitations

An initial delimitation is that this study is restricted to the state of Texas. This is also the last year of the TAAS testing program. The program has been restructured. The new program, the Texas Assessment of Knowledge and Skills (TAKS) exams will be more rigorous. The 2002-2003 school year will be a benchmark year for the new test. This provides the rationale behind the use of 2001-2002 AEIS data.

Additionally, this study will use only assessment results of students receiving special education in grades 3-8 and 10 who took the reading and mathematics TAAS exams in school year 2001-2002. This narrowed the focus and kept the scope of the study aligned with the initial TAKS emphasis on reading and the subsequent impact of the reading and mathematics exams on grade placement. A final delimitation of the study was the use of only one year's data. The results might not be indicative of other school years.

Summary and Organization of the Study

This study sought to explore if a statistically significant relationship existed between selected data from the Academic Excellence Indicator System (AEIS). It was a quantitative research design incorporating regression analysis as the statistical

procedure. Included in this study of Texas school districts were two criterion variables and ten predictor variables categorized into three groups. This exceeded recommendations that the researcher, utilizing regression analysis, have 15 to 20 times the number of cases as variables (StatSoft, 2004). Specifically, a hierarchical regression model was used to accomplish the analysis.

The percentage of students receiving special education services passing the grades 3-8 and 10 reading and mathematics TAAS exams (criterion variables) were analyzed in relation to specific AEIS indicators (predictor variables). Predictor variables were grouped as general district demographics, district fiscal variables, and district special education demographics. The general district demographic variables to be analyzed were district community type, district enrollment, district socioeconomic status, and district ethnicity. The district fiscal variables examined were district instructional expenditures per pupil, district instructional expenditures per student receiving special education services, and district wealth. District special education demographic variables included in the study were the district percentage of students receiving special education services, district percentage of students receiving special education services taking the grades 3-8 and 10 reading TAAS exam, district percentage of students receiving special education services taking the grades 3-8 and 10 mathematics TAAS exam, and the district special education data analysis system rating. Data was collected and analysis was conducted to determine the absence or presence of a statistical relationship between the criterion and predictor variables.

Chapter 2 contains a comprehensive review of the literature focusing on the historical, legal, and fiscal aspects of special education and school reform. This includes

a review of research on the relationship of expenditures and student achievement as well as an examination of the fiscal and demographic differences between school districts. Chapter 3 includes the research design, the population of subjects, data collection procedures, and data analysis procedures. Results and data analysis are presented in Chapter 4. Chapter 5 summarizes the research with conclusions and recommendations.

CHAPTER 2

REVIEW OF THE LITERATURE

This review of literature targeted school reform in the context of special education. A focused emphasis was to identify what the literature considered the successful education of students with disabilities and factors suggested to impact this success. These factors were identified by reviewing and tying together the evolution of special education with the school reform movement and high stakes standardized testing. The focus narrowed to an in depth investigation of school reform and special education in Texas.

Historical Development of Special Education

Education of the student with disabilities went through many stages. In the 1700s and 1800s a child with disabilities was, most often, not sent to school (Underwood & Mead, 1995). The first federal laws to assist the disabled dated back to the early days of our nation. In 1798, the Fifth Congress passed the first federal law to care for the disabled (Braddock, 1987). A Marine Hospital Service was opened to provide medical services for sick and disabled seamen (Underwood & Mead, 1995). The National Center for Children and Youth with Disabilities (NICHCY) reported that these laws were few, and prior to World War II the laws that did exist addressed the needs of war veterans and service-connected injuries (NICHCY, 1997). In the latter 1800s and early 1900s, the disabled who went to school were segregated in special classes to relieve stress on the school, teachers, and other children (Underwood & Mead, 1995). Social Darwinists of the period even argued about whether the disadvantaged should be helped at all (Dorn, Fuchs, & Fuchs, 1996). The ruling in *State ex re Beattie v. Board of Education* (1919)

provided a basis for the sentiment in that era. This court held that, if a child's presence in school was judged by the school board to be detrimental to the best interests of the school, exclusion was acceptable. Hutt & Gibby (1965) reported how this practice began to be seriously questioned. Many educational and social leaders of the time suggested segregation of the disabled in the education process was inherently wrong.

In 1945 classes for the physically and speech handicapped began in Texas. It was expanded to serve children with mental retardation, blindness, deafness, deaf-blind, minimally brain-injured, and a pilot program for the emotionally disturbed. In 1960, the *Administrative Guide and State Plan for Special Education* was developed (Harmon, 2000)

For the majority of our nation's history, schools often excluded certain children especially those with disabilities. Students of different races were also excluded by segregation (Underwood & Mead, 1995). As a prerequisite to legislation targeting children with disabilities, racial segregation was addressed by the 1954 Supreme Court case *Brown v. Board of Education of Topeka*. This case held that the "separate but equal doctrine" established by the Court in *Plessy v. Ferguson* (1896) was unconstitutional. The court concluded that in the field of public education this doctrine had no place as it was depriving the plaintiffs of the equal protection of the laws guaranteed by the Fourteenth Amendment. Findings from the 1966 *Coleman Report* supported this finding and suggested that poor black children did better academically in integrated, middle-class schools (Schugurensky, 2002). This report also had a conceptual and far-reaching impact on government education policy and legislation in the area of special education.

One of the first federal statutes to address the civil rights concepts associated with education was P.L. 89-10, The *Elementary and Secondary Education Act of 1965 (ESEA)*. This law provided a comprehensive plan for addressing the inequality of educational opportunity for low socio-economic children. It quickly became the statutory basis upon which early special education legislation was written. This act was quickly amended with P.L. 89-313 the *Elementary and Secondary Education Act Amendments of 1965*. These amendments authorized grants to state institutions and state operated schools devoted to educating children with disabilities. This was the first federal grant program specifically aimed at children and youth with disabilities (NICHCY, 1997).

In 1965, the Texas Administrative Guide and State Plan for Special Education was revised and detailed how special education classes in Texas were to be funded. Exceptional Children's Units (personnel units) were approved on the basis of need in the community according to a formula in the State Plan for Special Education. Funding was provided by the state except in budget balanced districts. These districts paid the special education teachers' salaries and operating expenses from per capita and local funds. Funds for maintenance, supplies, utilities, insurance, etc. were supplied by the state and allocated at $600.00 for each eligible classroom teacher unit and each approved special education classroom teacher unit. This plan also required that exceptional children be reported separately from the Average Daily Attendance (ADA) accrued on pupils in regular classes and could not be used to determine the number of eligible classroom teacher units (Harmon, 2000).

Congressional hearings in 1966 revealed that only about one-third of the 5.5 million children with disabilities in the country were being provided special education

(Verstegen, 1994). In 1966, findings from the Coleman Report suggested that poor black children did better academically in integrated, middle-class schools (Schurgurensky, 2002). This report had a conceptual and far-reaching impact on government policy and legislation in the area of special education. This was evidenced when Congress made initial efforts to provide for special education in public schools rather than at state-operated schools or institutions with the implementation of P.L. 89-750, the *ESEA* Amendments of 1966. Title IV amendments provided for a two-year program of project grants to the states for assistance in the education of students with disabilities (Underwood & Mead, 1995). These were discretionary grants to encourage state participation. Fifty million dollars and $150 million were appropriated in 1967 and 1968 respectfully (Fraas, 1986). A provision in Title VI also established the Bureau of Education for the Handicapped (Underwood & Mead, 1995). The intent was to provide leadership in special education. This leadership was provided by the National Advisory Council later reorganized as the National Council on Disability (NICHCY, 1997). P.L. 90-247, The *Elementary and Secondary Education Act Amendments of 1968*, was the final federal special education legislation of the 1960s. A set of programs was established that supplemented and supported the expansion and improvement of special education services (NICHCY, 1997).

Texas, in 1968, developed a report to expand programs and documented how to better serve students with disabilities under Title VI of the *Elementary and Secondary Education Act of 1965*. In 1969, Senate Bill 230, the *Comprehensive Special Education Act*, was passed. This bill, known as *Plan A*, based funding on services rather than the number of students receiving special education services. Districts were required to

apply for funds with evaluation criteria based on: (a) planning and evaluation procedures, (b) pupil appraisal, (c) instructional delivery, (d) special services, (e) parent involvement, (f) community resources, (g) staff development, and (h) accountability. The State Board of Education (SBOE) created a formula which provided each 3,000 pupils in a *Plan A* district with (a) 23 special education teacher units, (b) four supportive professional units, (c) allocations for pupil appraisals, and (d) special materials and consultative services. Smaller districts joined cooperatives to receive funds and serve this population of students (Harmon, 2000).

The Education for All Handicapped Children Act

The *ESEA* Amendments of 1970 repealed Title IV and created a separate act. This was P.L. 91-230 entitled the *Education of the Handicapped Act (EHA)* (Verstegen, June 1994). This legislation consolidated several separate federal grant authorities into one statute and provided for grants to states to encourage special education programming (Underwood & Mead, 1995). This was a core grant program for local education agencies and authorized a number of discretionary programs. Part B of the act authorized grants to the states and other outlying areas to help initiate, expand, and improve programs for disabled children. The state allotment under Part B of the *EHA* was based on the ratio of children ages 3 through 21 in all states. The minimum grant was set at the greater of $200,000 or three-tenths of 1% of available funds. The appropriations were $200 million, $210 million, and $220 million in fiscal years 1971, 1972, and 1973 respectively (Verstegen, 1994). For states to receive this funding, they were required to comply with the statutory framework for the provisions of special education. In 1970, only ten states had mandated education for the student with

disabilities. This number gradually increased in the early 70s, but many were still not served. Two landmark decisions in the early 1970"s greatly impacted the prevalent approach to educating students with disabilities.

Pennsylvania Association for Retarded Children v. Pennsylvania (1971) enjoined the State from denying education to mentally retarded children. The decision was based on the constitutional theories of equal protection and due process. The court ordered:

> "[A] free, public program of education and training appropriate to the child's capacity, within the context of the general educational policy that, among the alternative programs of education and training required by statue to be available, placement in a regular public school class is preferable to placement in a special public school class [i.e., a class for "disabled" children] and placement in a special public school class is preferable to placement in any other type of program of education and training" (*Pennsylvania Association for Retarded Citizens v. Pennsylvania*, p. 307).

Mills v. Board of Education (1972) produced a similar decree. The District of Columbia failed to provide publicly supported education and training to the plaintiffs and other exceptional children. The district also excluded, suspended, expelled, reassigned, and transferred these children from regular public school classes without affording them due process of law. Applicable statutes, regulations, and the Constitution required entitlement to relief. This judgment also set an elaborate framework for due process relating to labeling, placement, and exclusion of these students.

In 1973 the *Vocational and Rehabilitation Act* was passed (29 U.S.C. §§ 791, 793, 794(a)). Its purpose was to promote and enlarge opportunities, in both the public

and private sectors, for handicapped individuals by eliminating discrimination and the use of affirmative action programs (Legal Information Institute (LII), 1999). The congressional intent was identical to the intent of other civil rights legislation covering discrimination based on race, sex, religion, or national origin (Rebore, 1998).

Section 504 of the Act (29 U.S.C. § 794) states: “No otherwise qualified individual with a disability…shall solely by reason of her or his disability, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.” It is important to note that the *Rehabilitation Act* is a discrimination statute and not an entitlement statute. It provided very broad coverage to the individual but no benefits.

In response to these concerns Congress passed funding legislation. First, in 1974, Congress passed P.L. 93-380 which provided per child entitlements initially based upon the total number of children enrolled in school from the age of 3 to 21. Changes based the appropriations on the total state population of children from the age of 3 to 21, a census-based financing approach. P.L. 93-380 was followed in 1975 by more funding legislation in the form of P.L. 94-142 the *Education for All Handicapped Children Act of 1975 (EAHCA)*. This subsequently became *Part B* of the *Individuals with Disabilities Education Act of 1990 (IDEA)* (NICHCY, 1997).

Technically, this act was an amendment to the *EHA* of 1970 that had provided grants to states for special education. The *EAHCA* amended the Part B funding component of the *EHA*. It was a funding statute but created individual rights in that, in order for states to receive the funding they must comply with the statutory framework for the provision of special education. The detailed requirements became effective in 1977

and can be found in Title 34 of the *Code of Federal Regulations* beginning at section 300.1. The act established a new philosophy about how schools treat and educate children with disabilities (NICHCY, 1997).

President Ford signed the bill into law knowing that the administrative requirements would be enforced even though Congress appropriated far less than was needed. To date, the federal government had never appropriated the amount of money initially considered. Ironically, full funding had not been the intent of Congress. The intent was to appropriate funds to pay only the excess costs directly attributable to the education of handicapped children (U.S. Congress, House of Representatives, June 2, 1975) (Verstegen, 1994). Congress was only authorized to appropriate up to 40% of the excess cost states accrued serving the student with disabilities. The fiscal burden for implementation had fallen on state and local education agencies (Kemerer & Walsh, 2000). Parrish (2001) estimated federal support to be approximately 8% of the nation's special education costs.

The passage of P.L. 94-142, the *EAHCA*, provided for the expansion of the Part B program into a multi-billion dollar commitment by the federal government. A population-based allocation of $8.75 per child was kept. When the transition was made from the *EHA* to the *EAHCA*, states were assured that they would receive no less than what was received the previous year or $300,000, whichever was greater. A new grant formula had taken effect in fiscal year 1978. This authorized grants equal to the number of handicapped children age 3 through 21 who received a special education multiplied by: 5% of the national average per pupil expenditure in fiscal 1978; 10% of that expenditure in fiscal 1979; 20% in fiscal 1980; 30% in fiscal 1981; and 40% in fiscal

1982 and each succeeding year. This was a change from the population-based appropriations under the 1974 Amendments. States were also encouraged by the authorization of incentive grants of an additional $300 for each child receiving services. Additional stipulations were that states must pass through to school districts 76% of the federal grants and that this money would be distributed on the basis of the number of handicapped children served in each district (Verstegen, 1994).

A mechanism for within-state distribution was adopted that shifted the formula based on population (census) to one based on identified children with disabilities. Funds flowed to areas of need with relatively higher rates of special education eligible students and created an incentive to locate and serve those students (Verstegen, 1994). In 1975, Texas passed House Bill 76. This legislation effectively created a 4.00 weight for all students receiving special education services.

The *Education of the Handicapped Act Amendments of 1983*, P.L. 98-199, reauthorized the discretionary programs, established services to facilitate school to work transition, established parent training and information centers, and provided funding for projects and research in early intervention and early childhood special education.
The Texas legislature, in 1984, passed House Bill 72. This created funding weights for special programs that included special education. Funds from the state were determined by the amount of time students spent in special education, a weighted pupil approach. It was also determined that students receiving special education services would receive instruction in the general education curriculum and take the state tests, at this time the TEAMS test, unless exempted by the ARD committee (Harmon,2000).

P.L. 99-457, a set of 1986 amendments, mandated services for preschoolers and established the Part H program. Part H assisted states in the development of a comprehensive, multidisciplinary, and statewide system of early intervention services for infants (NICHCY, 1997). The 1986 Amendments also drastically increased the annual per capita allowance a state was eligible to receive on behalf of each preschool-aged child. This appropriation could not exceed $3800 per student (Verstegen, 1994).

Together, the *EAHCA* and Section 504 of the *Rehabilitation Act of 1973* formed the basis for securing educational rights for children with disabilities. The *EAHCA* presented the "carrot" of financial assistance that school systems must accept to avoid the "stick" of Section 504 (Underwood & Mead, 1995). They provided access to public education inputs and processes. As this access increased, greater demands were place on schools to provide appropriate academic outcomes. As a result, special education litigation increased with the United States Supreme Court issuing its first special education decision in 1982.

How much educational benefit should the *Individualized Education Plan (IEP)* convey? What are the reasonable criteria for an *IEP*? The Supreme Court, in 1982, attempted to answer these questions with its first special education decision *Board of Education v. Rowley* (Underwood & Mead, 1995). A child, with only minimal residual hearing who had been furnished with a special hearing aid for use in the classroom and who was to receive additional instruction from tutors, and her parents filed suit in federal district court to review New York administrative proceedings that had upheld the school administrators' denial of a request that the child also be provided with a sign language interpreter in all of her academic classes. The district court found that although the child

performed better than the average student and was advancing easily from grade to grade, she was not performing as well academically as she would without her handicap (*Rowley v. Hendrick Hudson Dist. Bd. of Ed.*,1980). Because of this disparity, the court ruled that she was not receiving a Free Appropriate Public Education (FAPE)," which the court further defined as "an opportunity to achieve full potential commensurate with the opportunity provided to other children." The Second Circuit Court of Appeals affirmed (*Hendrick Hudson Dist. Bd. of Ed. v. Rowley,* 1980). The Supreme Court reversed and remanded this decision holding that the *EAHCA*'s requirement of a FAPE was satisfied when the state provided personalized instruction with sufficient services to permit the handicapped child to benefit educationally from that instruction (*Board of Education v. Rowley,* 1982). This instruction and any services must be provided at public expense, must meet the state's educational standards, and must comport with the child's *IEP* as formulated within the Act's requirements. If the child was being educated in regular classrooms, the *IEP* should be reasonably calculated to enable the child to achieve passing marks and advance from grade to grade. The Act's intent was to provide access to public education by means of specialized services, not to guarantee a particular substantive level of academic achievement. There was no support for the contention that the child's educational program failed to comply with the substantive requirements of the Act. Adequate compliance with prescribed procedures would, in most cases, provide compliance with the substantive components of the *IEP*.

It should also be noted that there was opposition to this ruling. Heaney (1984) contended that the use of correct procedures to guarantee substantive rights "flies in the face of most educational experience" (p.460). Just going through the motions of

teaching and learning did not guarantee the acquisition of knowledge and skills. Subsequent litigation appeared to support this contention.

Hall v. Vance County Board of Education, handed down in 1985 by the Fourth Circuit Court of Appeals, addressed a lack of academic progress. James Hall had dyslexia, a neurological disorder that manifested itself as a reading disability where the reader has difficulty decoding and/or comprehending the symbols on a written page. The reader must learn to cope and develop alternative methods of deciphering. James had academic problems and was evaluated by the school. It was found that his intellectual ability was good, but a major discrepancy existed between his reading ability and actual reading skills. The district offered an *IEP* that provided 30 minutes of small group instruction twice a week. James was passed from the third to the fourth to the fifth grade. Each year, objective standardized testing, which produced specific grade equivalent scores, showed no growth. However, similar *IEP*s were developed each year. The court held that, although James received special education in his public school, his academic progress had not improved, and he developed more problems. Since the *IEP*s developed by Vance County did not provide James with an appropriate education from which he benefited, tuition reimbursement for private school placement was awarded (*Hall v. Vance County Board of Education*, 1985).

A 1985 ruling by a Federal Judge in New York provided a converse to the *Hall v. Vance County Board of Education* case. In this case, *Romeo v. Amback* (1985), an *IEP* was held adequate. Very specific educational goals, listed in the form of grade equivalent scores, were to be attained. It also provided for specific, standardized, objective testing as a means of obtaining these scores. Note the presence of

standardized testing in the previous two cases. This ruling, as with the *Hall v. Vance County Board of Education* (1985) decision, relied heavily on standardized testing as an accountability measure. Accountability was nothing new to special education (Erickson, 1998), but these two cases continued the shift from a focus on what was taught to what was learned.

Thornock v. Boise Independent School District #1 (1985) was a tuition reimbursement case heard by the Idaho Supreme Court. As in the *Hall v. Vance County Board of Education* (1985) decision of the Fourth Circuit Court of Appeals, this court held that two *IEP*s proposed by the school district were not sufficient because they had not included goals, objectives, appropriate objective criteria, evaluation procedures, and schedules for determining, on at least an annual basis, whether instructional objectives were achieved as required by 20 U.S.C. § 1401 (19). This student, 16 years of age at the time of the decision, had made little progress. Second grade had been repeated with little improvement for the next three years. Educational benefit was evidenced by the district in the form of grade promotions and classroom test scores. This evidence was presented despite the fact that the court cited poor scores on a California Achievement Test taken in fourth grade. This case again reinforced the need for objective testing. It also addressed the degree of educational benefit and refuted the district's demand for minimal progress.

The next case provided additional examples of poor assessment. The 1985 case, *Bonadonna v. Cooperman*, involving the New Jersey District Court, reversed the decisions of two administration law judges. In this case, the court held that assessment consisted primarily of non-standardized tasks and procedures coupled with objective

and subjective teacher evaluation. The procedures lacked scientific validity resulting in a discriminatory evaluation that had not met statutory requirements.

In 1989, the New Jersey Supreme Court, in *Lascari v. Board of Education of the Ramapo Indian Hills Regional High School District*, awarded tuition reimbursement to a dyslexic student's parents over a questionable *IEP*. Here, as in *Bonadonna v. Cooperman* (1985), the *IEP* had not provided for the objective, standardized measurement of educational objectives. The goals and objectives listed were vague to the point of being meaningless. Evaluation consisted of subjectively based remarks by teachers. The purpose of the *IEP*, as stated in 34 C.F.R. § 300.346, was to guide teachers and to insure that the child received the necessary education. The court held that without an adequately drafted *IEP* it would be difficult, if not impossible, to measure a child's progress. Without this measurement, it would also be impossible to determine the necessary changes to be made in the next *IEP*. An *IEP* incapable of review was inappropriate.

In 1990, not long after the *Lascari v. Board of Education of the Ramapo Indian Hills Regional High School District* (1989) case, a federal court in *Chris D. and Cory M. v. Montgomery County Board of Education* struck down another public school *IEP*. This case addressed problems similar to those found in the two previous cases. This *IEP* included only broad, generic objectives and vague methods for monitoring progress. The *IEP* stated that the student would maintain an 80% average in mathematics on the third grade level. The teacher was to evaluate the student by referencing daily work and chapter tests. No objective, standardized testing was incorporated into the assessment.

The Individuals with Disabilities Education Act

In 1990 Congress re-authorized the *EAHCA* entitlement with P.L.101-476 to the *IDEA*. The language of the statute was changed throughout by replacing the phrase "handicapped child" to "child with disabilities," thus reflecting a more individual-oriented language. This was consistent with the language in the *Americans with Disabilities Act of 1990* that expanded the scope of coverage under Section 504 into the private sector (Underwood & Mead, 1995). This re-authorization expanded the discretionary programs, mandated transition services, defined assistive technology devices and services, and added autism and traumatic brain injury to the list of categories of children and youth eligible for special education and related services. It also clarified settings in which services could be delivered, allowed suits in federal court against the states to enforce the *IDEA*, added administrative provisions, required the granting of awards to minority higher education institutions, and deleted provisions for the collection of state and local special education financing (Aleman, 1991). The 1991 Amendments (P.L. 102-119) increased minimum funding for state administration from $350,000 to $450,000.

In 1993, the funding scheme in Texas was adjusted with the passage of Senate Bill 7. This created a mainstream add-on weight of 1.1 to the existing special education funding system. This was done to encourage the least restrictive environment placement (placement in general education classrooms for the entire school day) of these students and provided the add-on weight as a financial incentive. Other weights were altered and eliminated which allowed for increased spending by the state to fund programs for students receiving special education services (Harmon, 2000).

Texas provided a good example of a pupil weighted formula found in the Tier 1 guaranteed yield component of its finance scheme. Districts were entitled to state special education funding based on the following calculations: Full Time Equivalents (FTEs) = (eligible days present x contact hour multiplier)/(days taught x 6). Special Education Allocation = FTEs x weight x adjusted allotment. The contact hour multiplier and weight varied depending upon the instructional arrangement in which a student was being served and were statutory (Texas Education Code, Section 42.151) (TEA, 23796). In 1993, the instructional settings were mainstream, resource room, self-contained mild/moderate, and self-contained severe. There was no contact hour multiplier for mainstream like there was for the other special education arrangements. Mainstream was on an Average Daily Attendance (ADA) basis with the federal 1.1 funding weight. Mainstream ADA was not subtracted from refined ADA like the other special education FTEs. This meant that a mainstream student in ADA was generating 1.0 worth of ADA funding for the regular program and 1.1 worth of mainstream funding. The contact hour multiplier of 2.895 was used for resource, self-contained mild and self-contained severe (TEA, 23670).

In 1997, federal revisions were again made to *IDEA* (P.L. 105-17). A key component of the amendments, relying on 20 years of research, was that the education of children with disabilities was made more effective by ensuring their access in the general curriculum to the maximum extent possible. Parental involvement was increased by requiring their participation on the team determining eligibility (Wright, P.W.D., 1999). Changes were also made regarding discipline procedures. Major changes were made to the *IEP*. The *IEP* was to be linked to present levels of

achievement and must include measurable outcomes. It was emphasized that these outcomes needed to show progress. The *IEP* team must include parents, a regular and special education teacher, a representative of the local education agency (LEA), an individual who can interpret the instructional implications of evaluation results, and at the parent or agencies discretion there can be other knowledgeable individuals. Lack of any member could be a major procedural breach (Wright, P.W.D., 1999).

There were also significant changes to the finance provisions for grants to states and preschool programs (Verstegen, Parrish, & Wolman, February 1997). Until appropriations for Part B exceeded $4,924,672,200, state and sub-state grants would be calculated using the formula in the prior law. This formula was based on the number of children with disabilities who were receiving special education and related services. When appropriations exceeded the $4.9 million, a new permanent formula took effect. States continued to receive a base-funding amount equal to their award in the year before the appropriations exceed the $4.9 million. Of the funds above the base year amount, 85% were distributed based on a state's relative share of the entire school-aged population. The remaining 15% was distributed based on a state's relative share of the entire school-aged population in poverty (Verstegen, Parrish, & Wolman, February 1997-98).

Federal funding for State Education Agencies (SEAs) was also revised. Of the what the state received, 25% cumulatively adjusted each year by the lesser of the growth in inflation or the percent increase in the state award over the previous fiscal year, was allowed to be used for administration and other direct services and support. This was a change from the 1991 amendments that set a $450,000 minimum. Under

these provisions, states could not reduce the amount of state funding for special education below the level of the prior year. Local Education Agencies (LEAs) were required to use Part B funds for the excess costs of providing education and related services to disabled children to supplement and not supplant other funds and to maintain spending at the level of the prior year. Exceptions to this rule were allowed under certain circumstances where these funds could be treated as local funds (Verstegen, Parrish, & Wolman, 1997-98). The policy stance that prior funding provisions provided incentives for more restrictive placements may have impacted these provisions (National Council on Disability, 2000).

Federal policy under *IDEA* had always required that special education services be provided to students “in the least restrictive environment” (Parrish, Fall 1993). Changes to special education placement trends continued to occur in initiatives referred to as “inclusion,” integration,” or “mainstreaming.” Some educators argued that all students should have the right to be educated with nondisabled students in regular classrooms. Others felt that the federal requirement was to provide for a range of placement options. Few policymakers saw these positions as mutually exclusive and suggested that the issue might be theorized as a relative balance between the two principles. Debate continued to center around the exact circumstances under which any type of separation and/or placement was warranted. A resulting question arose as to whether or not state funding provisions impacted placement.

The various funding schemes used by the states were predominately based on pupil weights, resource allocation, percent reimbursements, and flat grants. Pupil weighting formulas based allocations on two or more categories of student-based

funding for special programs expressed as a multiple of regular education aid. Resource funding was based on the allocation of specific education resources (e.g., teachers or classroom units). The classroom units were derived from prescribed staff/student ratios by disabling condition or type of placement. Percent reimbursement funding rested on a percentage of allowable or actual expenditures. The flat grant provided a fixed funding amount per student or per unit (U.S. Department of Education, 1995).

All special education funding systems contained some type of placement incentives with some incentives rewarding more restrictive placements. Despite this fact, evidence had not existed to claim that states deliberately designed their funding formulas in order to foster more restrictive placements. A Center for Special Education Finance (CSEF) brief in 1993 reported that these types of incentives were most likely efforts by the states to focus on other issues such as the adequacy and equity of funding and the ability to track and audit federal funds. As funding designs evolved states began to recognize that formulas might possibly be fostering restrictive placements (Parrish, Fall 1993). This reauthorization of *IDEA* incorporated a census-based funding adjustment in the federal funding formula. This supported a state trend away from the pupil weighted approach and toward census-based funding (Kaleba & Parrish, 1997-1998).

The 1997 reauthorization of *IDEA* also required data collection and studies to measure and evaluate the impact of *IDEA* and the effectiveness of state efforts to provide a free, appropriate public education to all children with disabilities. Special education enrollment and costs continued to increase. As a result of this increase, the U.S. Department of Education, Office of Special Education Programs funded CSEF to

conduct a national Special Education Expenditure Project (SEEP). Funding had been provided to CSEF at the American Institutes for Research (AIR) to conduct the study (Chambers, Parrish, & Harr, June 2004).

The results of this study indicated that, during 1999-2000, approximately $50 billion was spent on special education services. This was $8,080 per student receiving special education services. Total spending to provide regular and special education services to students with disabilities was $77.3 billion. This was $12,474 per student. One billion additional dollars was spent on students with disabilities through programs such as Title I, ESL, and gifted and talented. This brought the total per student amount to $12,639. The difference between total expenditures per student receiving special education services ($12,474) and total expenditures per regular education student ($6,556) indicated that an additional $5,918 was expended to educate the average student with disabilities. Of the 1999-2000 spending on all elementary and secondary education services, 25% targeted the student with disabilities. In 1999-2000, federal *IDEA* funding was $3.7 billion or 12.2% of the additional expenditures on students receiving special education services. If Medicaid funds were included, this percentage increased to approximately 12% (Chambers, Parrish, & Harr, June 2004).

The Special Education Expenditure Report also explored variation in spending across districts. The results of this study made extensive use of cost-adjustments. This took into account that districts in different geographic locations faced differences in the costs of resources used to provide education services. Spending ratios (spending for special education in relation to regular education) were also examined. It was reported that the smallest districts (fewer than 2,500 students) spent 14% more in actual dollars,

and 22% more in cost-adjusted dollars, to educate a student receiving special education services when compared to the largest districts. Not only had these smaller districts provided more resources for the student receiving special education services, they were getting more for the amount of money spent than larger districts. These smaller districts had a spending ration of 2.19, compared to an overall spending ratio of 1.90. Urban districts spent the most in actual dollars with a spending ratio of 1.95. Rural districts spent the most in cost-adjusted dollars and the least in actual dollars with a spending ratio or 1.82. The study also reported that one third of the districts with the lowest median family income spent less in both actual and adjusted dollars. Middle-income districts spent $2,314 more actual dollars per student than districts with the lowest-income families ($1,658 cost-adjusted). Despite this difference, there was no statistical relationship found between expenditures and district poverty levels in terms of actual or cost-adjusted dollars spent. It was found that low-poverty districts had the lowest spending ratio (1.72) when compared to 1.86, 1.97, and 1.98 for the third, second, and first quartiles respectively (Chambers, Parrish, Esra, & Shkolnik, November, 2002).

Initial implementation of the *EAHCA* was felt to be shortchanged by low expectations for the student receiving special education services. Statutory changes indicated a policy shift emphasizing education outcomes rather than access and educational inputs. Litigation subsequent to *IDEA* suggested a need to provide some definition of successful academic progress for the student receiving special education services. A review of targeted cases indicated a continued focus shift from what had been taught to what had been learned.

This first case examined provided a holding similar to that of the 1985 *Romeo v. Ambach* litigation. The court, in *French v. Omaha Public Schools* (1991) also upheld a valid *IEP*. This court analyzed the goals and objectives in accordance with Appendix C (Appendix A under *IDEA 97*). The *IEP* provided for extremely specific test data, including percentile ranks and grade equivalent scores, to describe the child's present and expected levels of performance.

As in the *Board of Education of the Hendrick Hudson Central School District v. Rowley* (1982) case, the degree of educational benefit was addressed in *Florence County School District Four v. Shannon Carter* (1993). In the *Carter* case, reimbursement for private school placement was allowed on the basis of an inappropriate *IEP*. The student, Shannon Carter, had a 36 point discrepancy between her verbal and performance IQ. The school district refused to provide help while insisting that the student was lazy, unmotivated, and chose not to read. Pressure from parents and private sector experts resulted in an *IEP*. The caveat was that the stated goals proposed increasing her reading level from a fifth-grade fourth-month level to a fifth-grade eighth-month level (5.4 to 5.8) and her mathematics from a sixth-grade fourth-month level to a sixth-grade eighth-month level (6.4 to 6.8) over the course of a complete year. The student was about to enter the tenth grade. It was ruled that even if all goals had been met, Shannon would continue to fall behind her classmates.

The federal district court in *Carter v. Florence County School District Four* (1991) ruled in favor of Shannon. This court suggested that even if all of the goals of the *IEP* had been met, the student would continue to fall behind her classmates. The stated progress of four months over an entire school year insured the programs inadequacy. At

a minimum, the district was obligated to provide a program that would allow passing marks and advancement from grade to grade. The Court of Appeals for the Fourth Circuit (1991) affirmed this decision agreeing that the *IEP* was inappropriate. The Supreme Court (1993) review found that the school district's proposed *IEP* was inappropriate and ruled in the Carter's favor regarding tuition reimbursement. Just showing any measurable amount of progress had not insured appropriate progress. It could be suggested that this decision of the Court was in subtle contrast to the 1982 *Rowley* decision.

In *Rowley*, the Court's position was that adequate compliance with prescribed procedures would, in most cases, provide compliance with the substantive components of the *IEP*. Schools were not required to maximize benefit. In *Carter*, the four month growth, over a complete school year, was not enough. Litigation that followed the *Rowley* decision appeared to progressively place more emphasis on what had actually been learned.

Gerstmyer v. Howard County Public Schools was a 1994 Maryland Federal District court case that also dealt with poor assessment strategies and private school tuition reimbursement. The student in this action suffered from dyslexia. The school felt that six-year-old Alex Gerstmyer, a kindergarten student, would grow out of his reading problems and delayed testing to determine if there was a specific learning disability. Subsequent evaluation by a private sector psychologist revealed dyslexic tendencies. The school then proposed a vague *IEP* that did not provide the services needed to overcome Alex's reading problems. At this time, the parents placed Alex in a private Montessori school and brought suit for tuition reimbursement in which they prevailed.

The judge held that the public school *IEP* stated only general goals and poor assessment strategies. There were no provisions for the use of objective testing to measure academic growth.

Evans v. Board of Education (1996), a Federal District Court case out of the Southern District of New York, dealt with a fifteen-year-old dyslexic young man possessing well above average intelligence. He failed every seventh grade subject but was promoted to the eighth grade and furnished with a similar *IEP*. Recall that in the *Hall v. Vance County Board of Education* (1985) case, the student was passed from third to fourth to fifth grade and similar *IEP*s were developed each year.

The parent was not satisfied with this lack of progress and placed the student in a private school (*Evans v. Board of Education*, 1996). The parent also requested a hearing. The school, because of the lack of personnel to implement some parts of the *IEP*, did pay for the student's tuition thus avoiding the initial hearing request. Subsequently, the school hired a teacher to address the student's learning problems. The parent did not feel that the individual hired was qualified and again requested a hearing. Objective testing at the private school did show that the student was making appropriate, grade level progress using alternative methods of instruction in all classes. Local and state hearing officers ruled that the school's *IEP* was reasonably calculated to provide educational benefit. They ignored the fact that subjective teacher observation and testing was to be used to assess educational growth. At this time, the school ceased tuition payments which resulted in the federal district court action. The judge overturned both hearing officers and awarded tuition reimbursement. There were also extensive procedural violations.

Germaine to this discussion was the fact that there was no accurate information about the student's present level of functioning, and objective strategies to evaluate progress were not included in the *IEP*. It was mandatory that the *IEP* follow the guidelines laid out in Title of the U.S.C., Title 34 of the C.F.R. and Appendix A (formerly Appendix C) be followed. These statutory codes stated that the *IEP* must include present levels of performance, a statement of annual goals which would also include short-term educational objectives, a statement of the services to be provided, dates for initiation of these services, and appropriate objective criteria and evaluation procedures and schedules. These evaluation procedures must be able to determine, on at least an annual basis, whether the short term instructional objectives were being met.

Cleveland Heights-University Heights City School District v. Sommer Boss was decided in 1998. Tuition reimbursement was granted as a result of faulty testing and an inappropriate *IEP*. Sommer Boss had repeated Kindergarten on school staff recommendation. While repeating kindergarten, she was tested and found to have speech and language problems. Speech therapy was provided, and, after entering first grade, she was also placed in a Chapter 1 federally funded reading program.

At the end of the year, Sommer's total reading had slightly improved while her vocabulary regressed. She had been working at a mid-kindergarten level and received satisfactory pluses for reading on her report card. Another *IEP* had been developed, and Sommer continued in Chapter 1 reading. For the next two years her testing showed stagnation or regression while report cards consistently showed satisfactory performance. These facts were very much like those found in the *Hall v. Vance County Board of Education* (1985), and *Evans v. Board of Education of Rhinebeck Central*

School District (1996) cases where progress was lacking. The parents requested testing but the district did not get around to it before the end of her third grade year. Private testing during the summer made no statement of a learning disability.

Subsequently, Sommer's parents placed her in a private school when the district would not act upon a waiver to allow Sommer to receive special education. Later, while in private school placement, the district tested Sommer and found that she had a specific learning disability. Sommer finished the year enrolled in the private school.

In the summer, meetings were held with the school district. Initially, the district had not believed there was an obligation to develop an *IEP* for Sommer. After the district realized that it was obligated under federal law, even with Sommer attending a private school, *IEP* discussion began. The Bosses rejected all proposed *IEP*s. The *IEP* provided no objective way to measure progress. The *IEP* also inadequately explained the specific services she would receive while in the normal classroom. The Bosses re-enrolled Sommer in private school and filed an *IDEA* based claim for tuition reimbursement.

An independent hearing officer, a state level review officer, and the United States District Court for the Northern District of Ohio held for the Bosses. The Federal Court of Appeals for the Sixth Circuit affirmed these decisions. At each level of litigation it was concluded that the *IEP* developed by the district for Sommer did not comply. The *IEP* was not in place at the beginning of the school year and had not provided appropriate objective criteria for measuring progress. This particular *IEP* stated that Sommer's progress would be measured in terms of her ability to do such things as "identify a list of sight words…with 80% accuracy" and "improve her reading fluency when reading a

passage aloud 8/10 times." Vague and general statements such as these examples and a lack of objective standardized testing offered no basis for measuring progress.

The holding in several of these cases dealt with amounts of educational benefit. The *Board of Education v. Rowley* (1982) decision told us that the *IEP* must provide the student with disabilities access to a FAPE but not necessarily the best. Academic growth was mandated but a maximization of this growth was not necessary. The *Romeo v. Ambach* (1985) and *French v. Omaha Public Schools* (1991) decisions give insight into the contents of a statutorily appropriate *IEP*. Both *IEP*s provided for very specific goals and objectives as well as objective standardized testing as a means of measuring these goals. Grade equivalent scores and percentile rankings had been ruled appropriate measures of progress.

While the *Rowley* decision had not mandated a maximization of educational benefit, it provided a mandate for progress. Five of these cases regarded students who were showing no academic progress; *Hall v. Vance County Board of Education* (1983), *Gerstmyer v. Howard County Public Schools* (1994), and *Cleveland Heights v. Sommer Boss* (1998). Another case, *Florence v. Carter* (1993), dealt with a student whose *IEP* provided for only four months worth of progress over an entire school year. This was held to be an unacceptable standard of academic growth. *IEP*s should be calculated to show reasonable growth. For the child being educated in the regular classroom, the *IEP* should be reasonably calculated to enable the child to achieve passing marks and advance from grade to grade (*Board of Education v. Rowley,* 1982). Facially, case law appeared to be relatively consistent with these types of rulings. A possible resulting

policy stance was subsequent emphasis on higher expectations for the student receiving special education services.

Educational goals and the methods to assess the attainment of these goals also influenced litigation. Refer to *Bonadonna v. Cooperman* (1985), *Lascari v. Board of Education of the Ramapo Indian Hills Regional High School District* (1989), and *Chris D. and Cory M. v. Montgomery County Board of Education* (1990). Goals and objectives were to be very specific. It was mandatory that they be objectively measured with standardized testing. Identifying a list of sight words with 80% accuracy, improved reading fluency when reading a passage aloud 8/10 times, or requiring an 80% average on a third grade level in math was not enough. It appeared that, for this testing to be valid, there could be no hint of subjective evaluation. Teacher observation and teacher made tests simply did not work. It was imperative that teacher evaluation be backed by, and correlated with standardized testing.

The *Hall v. Vance County Board of Education* (1983), *Evans v. Board of Education of Rhinebeck Central School District* (1996) and *Cleveland Heights-University Heights City School District v. Sommer Boss* (1998) cases revealed another area which influenced court decisions. These three cases pointed out some suggested problems with public education grading practices. In *Hall*, the student was passed from grade to grade when testing revealed no growth. In the *Evans* case, the student failed every subject in the seventh grade but was promoted to eighth grade. In the *Cleveland Heights* case, the student went from kindergarten to third grade when testing showed stagnation or regression while report cards showed satisfactory performance.

It appeared that case law had and continued to play an important role in educational policy development. Measurable objectives, objective rather than subjective standardized testing, and inadequate academic growth were frequent themes. Issues such as these provided a strong basis for the investigation of high stakes standardized testing in relation to the student receiving special education services.

When closely examined, the *Rowley* (1982) and *Carter* (1993) decisions provided subtle contrasts. The school district prevailed in the *Rowley* decision while the parents prevailed in the *Carter* decision. Both outcomes hinged on the degree of educational benefit, and both students ended up making significant gains at a private school using different instructional strategies. It could be suggested that in *Rowley*, the Court left well enough alone since the student was progressing from grade to grade. The Court had no issue with access, equity, or procedural violations.

In the *Carter* case, a growth greater than one grade level per year at the private school may have influenced the Court. The educational services provided by the private school allowed progress from a sixth grade to twelfth grade reading level in less than six years. It appeared that there was a need for more than a minimum of educational benefit.

It could be questioned whether or not the *Rowley* decision provided an appropriate groundwork for determining how much educational benefit was enough. The Court stated that “the system itself monitors the educational progress of the child. Regular examinations are administered, grades are awarded, and yearly advancement to higher grade levels is permitted for those children who attain an adequate knowledge of the course material.” The attorney in the *Florence County School District Four v*.

Carter (1993) case suggested that the courts, by providing a basis for minimum requirements, held some of the responsibility for schools which refused to provide children with a program permitting more that just grade to grade advancement (Wright, 1999). The United States Department of Education questioned this assumption in a different manner.

A U.S. Department of Education Office of Educational Research and Improvement (1994) report was released regarding grading practices in public schools. Average grades in middle school math and English had crept up from a C to a B. It was the feeling of some that grade inflation was a serious academic problem and one could not assume that "passing grades" showed that a child was making academic progress. How would we know whether or not objective measures had consistently been used with all students? Again from the *Rowley* Court;

> "Children who graduated from our public school systems were considered by our society to have been 'educated' at least to the grade level they had completed, and access to an 'education' for handicapped children was precisely what Congress sought to provide for in the Act."

If a student had passing grades, could it be argued that he was receiving an appropriate public education? *The Cleveland Heights-University Heights City School District v. Sommer Boss* (1998) decision affirmed that this could be argued. As a footnote, the Rowley Court added, "We do not hold today that every handicapped child who is advancing from grade to grade in a regular public school system is automatically receiving a FAPE.

Children with disabilities were to be provided a FAPE (20 U.S.C. §1400(c)), that the education be provided according to plan through an individualized education program (20 U.S.C. §1401(18)(D)), and that the individualized education program was designed to aid children with disabilities to "benefit from special education" (20 U.S.C. §1401(17)). *Rowley* seemed to have clarified how the first two of these requirements were met but gave little guidance for the third (Bates, 1996).

The district court in *Rowley v. Hendrick Hudson Dist. Bd. of Ed* (1980) ruled that receiving a FAPE could be defined as an opportunity to achieve full potential commensurate with the opportunities available to other children. This was the ruling that was subsequently reversed by the Supreme Court. The *Rowley* Court had not required this achievement of full potential. The decision in the *Carter* case, it seemed to require more than just minimal achievement. The cases reviewed consistently found a lack of measurable objectives, subjective rather than objective standardized testing, and inadequate academic outcomes or growth. The achievement of full academic potential seemed to be, concurrently, at the heart of special education litigation as well as school reform and the standards movement.

Accountability and Assessment

The National Defense Education Act and Coleman Report

In 1957 the Soviet Union launched the first orbiting earth satellite. This was perceived as a threat to national defense and created a belief that the Soviets were outperforming American students in mathematics and science. A renewed interest in public education resulted in a substantial increase in federal funds (Crisfield, 1999). The *National Defense Education Act (NDEA)* was passed and provided funds for instruction

in science and technology (Guthrie, Garms, & Pierce, 1988). Educational leaders at this time were also being held more accountable for student performance. It could be suggested that this was the infancy of the reform movement the country had experienced. Crisfield (1999) also believed that this was a primary catalyst for researchers to begin examining relationships between school inputs and achievement outcomes.

Title IV of the *Civil Rights Act of 1964* called for an investigation of the availability of equal educational opportunities for individuals by reason of race, color, religion, or national origin in public educational institutions at all levels in the United States (Schugurensky, 2002). The resulting *Coleman Report* summarized indicators of quality schools, factors affecting student achievement, and perspectives for facilitating higher student achievement (Smith, 1999). It was the first serious attempt to examine the effects of school characteristics on student achievement. While money mattered in regards to items that were expensive for schools to provide such as training, facilities, and programs; other items such as socioeconomic status and race had a much more profound impact on student achievement. Generally speaking, public schools had not made a significant difference with children from poor families and homes (Association for Effective Schools, 1996). These students lacked the prime conditions or values to support education and could not learn regardless of what the school did.

For many years, the Coleman Report strongly influenced government policy makers with goals to improve student achievement and provide equal educational opportunity (Smith, 1998). It had been the first report that seriously attempted to examine the effects of school characteristics on student achievement. One aspect of

this achievement was performance on standardized tests (Webb, 2001). After this report, other researchers began using this research model to predict student outcomes. This initiated the use of standardized testing results as a policy making tool. It was the first, largest, and best-known production-function study.

In the 1970s, most standardized tests were normative in nature (Webb, 2001). The tests were designed to provide scores in relation to the norm, or the 50th percentile. Bracey (2000) reported that norm-referenced tests bothered many researchers since, by definition, half of all test-takers were always below average. These tests were the easiest to obtain; thus most commonly used. The emergence of criterion-referenced tests changed the manner in which educational outputs would be measured and altered the course of accountability and funding for public education. In the 1960s criterion-referenced tests began to be developed (Bracey, 2000). They were specifically designed to provide for quantitative interpretation. More fully developed tests appeared in the 1970s and became a popular method of measuring academic achievement. Criterion-referenced tests became especially useful in testing minimal or basic skills.

There were some who generally accepted the conclusions of the *Coleman Report* but others, such as Ronald Edmonds, refused to accept it when published (Association for Effective Schools, 1996). This became the basis for effective schools research. Edmonds and others set out to find schools where students from low income families were successful and prove that schools do make a difference. When these schools were located, comparisons with similar schools were made to determine why. From this research, characteristics or correlates were observed and documented. It was this body of correlated information that began Effective Schools Research. As a result,

desegregation and fiscal inequities continued to be debated, but budget cutbacks in many districts slowed expensive reforms. Into the late sixties the educational needs of poor children and minorities lost some impetus even with conditions relatively unchanged (Rossi, & Montgomery, 1994).

Increasingly during the 1970s and 1980s there was criticism of the *Coleman Report* (Webb, 2001). The reliability and analytical procedures were scrutinized by researchers such as Bowles & Levin (1968), Cain & Watts (1970), and Hanushek & Kain (1972). There were other researchers who questioned the statistical techniques used in the study (Alexander & Salmon, 1995). Interesting was the fact that a reanalysis of the original data by Coleman, six years after the report, suggested inflated estimates of the influence of home background after controlling for the effects of other variables such as unexamined school characteristics (Mann, 2001). It was suggested that replicated research in all types of schools had reaffirmed the findings that schools do make a difference (Association for Effective Schools, 1996).

It was in the late 1970s that Texas entered into the use of criterion referenced testing. The Texas State Legislature, in 1979, passed a bill which required the Texas Education Agency (TEA) to adopt a series of criterion-referenced exams and assess basic competencies in mathematics, reading, and writing for students in grades 3, 5, and 9. This assessment, the Texas Assessment of Basic Skills (TABS), was the first formal assessment in Texas that explicitly linked student assessment results to a state-wide curriculum. Interestingly there was no mandated statewide curriculum at the time. TEA, along with teachers, principals, and curriculum and psychometric specialists, developed the objectives which were representative of a small portion of the skills

students were expected to learn in Texas public schools (Westinghouse Information Services, 1982) (Cruse & Twing, 2000).

A Nation at Risk

On April 26, 1981, under the Reagan administration, Secretary of Education T. H. Bell created the National Commission on Excellence in Education (Shibler, 1997). The Commission's purpose was to investigate the quality of education in the United States. A suggested public perception was that something was seriously awry with the country's educational system. The resulting 1983 report, *A Nation at Risk*, suggested that schools were producing a generation of Americans that were scientifically and technologically illiterate (National Commission on Excellence in Education, 1983). This report became widely cited and warned that U.S. students achieved lower skill levels than students in other industrialized nations.

It was also in 1983 that the Texas Education Code was amended again to require ninth grade students who had failed the TABS test to retake the exam each year thereafter. The individual students were not held accountable nor were they denied diplomas for failing the exam. The legislative intent at the time was to increase the pressure on schools to provide remedial support for students falling below minimum expectations. This also marked the first time that the results of the TABS testing for each campus and district were released to the public. This publication of results represented the beginning of high-stakes accountability for large-scale assessment in Texas (Cruse & Twing, 2000).

Less than a year after the publication of *A Nation at Risk*, approximately 300 task forces had been created at the state and national levels. The primary focus of each was

the development of education reform proposals (Heise, 1995). There was also an enormous increase in financial resources that were flowing to the states (Odden, 1990). As fiscal resources increased, and the use of standardized testing expanded, a more definitive view of accountability in the field of public education evolved. Accountability had traditionally focused on inputs in the form of dollars spent and what could be purchased (Cavazos, 2002). In 1984, when the Department of Education released the first education performance chart, the public became able to see comparative student performance data. The result was that accountability became addressed by providing measures of elementary, secondary, and vocational/technical education performance.

As a result of the *A Nation at Risk* report concerns arose regarding the nations future work force (Rossi & Montgomery, 1994). Major economic and social changes were suggested to return educational equity to the national spotlight and policy makers increased the call for excellence in education. This resulted in a multitude of reports that recommended even non-college-bound students develop strong academic proficiencies. A major recommendation of the report was the use of standardized tests of achievement to certify a student's credentials, identify the need for remedial intervention, and identify the opportunity for advanced and/or accelerated work. Furthermore, these tests should be administered as part of a nationwide system of state and local standardized tests. Right after this document was published, attempts began to be made in earnest to increase academic achievement (Scherer, 2001). This was done by making graduation requirements more rigorous and signaled the first wave of in depth high-stakes standardized testing. It was the major impetus for the current reform in public schools (Grubb, 2000).

In 1984, subsequent to the release of the *A Nation at Risk Report*, The Texas Education Agency passed HB 72. The wording of the Texas Education Code was changed from "basic skills competencies" to "minimum" basic skills. This was seen as a mandate to increase the rigor of the assessment component and included individual student sanctions for performance. The TABS testing was replaced with the Texas Educational Assessment of Minimum Skills (TEAMS). Students in grades 1, 3, 5, 7, 9, and 11 were administered criterion-referenced achievement tests in the subjects of reading, mathematics, and writing. Passing standards were set, and the grade 11 test became an exit-level exam required for graduation beginning with the classes of 1987 (Cruse & Twing, 2000).

TEAMS mirrored the *A Nation at Risk Report's* increased emphasis on educational reform. Not only was there a change in wording from measuring basic skills competencies to the measurement of minimum basic skills (adding individual student sanctions for performance) but an increase in the number of grades tested. The biggest adjustment was the denial of diplomas based on students' test performance. Mandatory remediation and retesting of these failing students was also required. Passing standards were set after the survey of superintendents and curriculum staff from approximately 1000 schools in regards to the appropriateness of the curriculum and associated assessment. The publication of campus and district reports continued and aided in the increased emphasis and use of high-stakes standardized testing in Texas (Cruse & Twing, 2000).

The Texas Academic Excellence Indicator System (AEIS) also originated with the passage of House Bill 72 in 1984. This system called for accountability based primarily

on the performance of students (TEA, 1998). Under the protocol of the AEIS, districts and campuses were separated into four broad general ratings with four base indicator standards (TEA, 1999). Testing results were the backbone of this high stakes rating system. Each of the four base standards (Exemplary, Recognized, Acceptable, and Low-Performing) set a passing standard for student performance based on the performance of the total student population (TEA, 1998).

In the late 1980s, revisions in the Texas Education Code and Texas Administrative Code resulted in a number of changes to the state assessment program. Included changes were an expansion of the content being measured. More of the content tested was directly linked to the core curriculum's essential elements (EE) with a greater emphasis on the assessment of problem-solving and critical thinking skills. The new program, TAAS, was implemented in 1990 (Cruse & Twing, 2000). This new testing program reflected policy positions of both the State Board of Education and the Commissioner of Education that students should attain higher levels of academic achievement. The purpose of the testing program had gradually evolved from school-level diagnosis of individual student performance to include state-level evaluation of school accountability for student performance (TEA Policy Research Report 9, 1997).

America 2000

In the 1980s, the results of most standardized tests for high school students were lower than they had been for the previous two decades (National Education Goals Panel, 1999). In October of 1989, President George H. Bush met with the governors of all 50 states and the territories for a national summit on education (Cavazos, 2002). This summit, in Charlottesville, Virginia, was the first time that a meeting between a U.S.

President and the governors focused on how to improve America's educational performance (National Education Goals Panel, 1999). At this meeting, it was agreed that the United States needed clear national performance goals and that the states needed more efforts to improve education in order to attain these goals. This conference published *America 2000* (White House, 1990) hoping to provide a clearer direction in education by the adoption of national goals. The six original goals, to be met by the year 2000 were:

- for every child to begin school ready to learn
- to increase the high school graduation rate to 90%
- for students to demonstrate competency in challenging subject matter
- to take American students beyond competence and make them first in the world in mathematics and science
- to ensure that every adult American be literate and prepared for lifelong learning
- to ensure school be free from drugs, violence, and an undisciplined classroom (Cavazos, 2002).

The Charlottesville conference also formed the National Education Goals Panel (NEGP). This panel consisted of eight governors, four members of Congress, four state legislators, and two members appointed by the President. The responsibility of this panel was to report national and state progress toward the goals, to identify promising educational practices, and to build consensus (NEGP, 1999). The report also stated that the *National Assessment of Educational Progress (NAEP)* would begin regularly collecting state-level data in grades 4, 8, and 12 in all five core subjects and made

available at district and school levels for states that wished to use them (Webb, 2001). Despite the work of many, these goals were not met by the year 2000 (Cavazos, 2002).

In Texas, the TAAS had also undergone a number of changes in regards to the grades and subject areas tested as well as the time of year for test administration. Prior to the 1992-1993 school year, students in grades 3, 5, 7, 9, and 11 were tested in reading, mathematics, and writing in the fall. The 1992-1993 school year became a transition period when spring testing was instituted (TEA Policy Research Report 9, 1997). TAAS was given to students in Grades 3, 7, and 10 (exit level) in the fall of 1992 and to students in grades 4, 8, and 10 (exit level) in the spring of 1993 (TEA Technical Digest, 2001).

Goals 2000

When President Clinton took office in 1993 ten years had passed since the release of *A Nation at Risk* and the reform movement continued under his administration (Riley, 2002). One of the first agenda items under the Clinton administration was the passage of Goals 2000: The *Educate America Act* (Riley, 2002). This continued the push for reform from the federal level and expanded on the six national goals proposed in America 2000 (Webb, 2001). Congress added a goal for teacher education and professional development as well as a goal for the expansion of parental participation. The *Elementary and Secondary Education Act* was also reauthorized by the *Improving America's School Act of 1994* (U.S. Dept of Education, 2002). Under this legislation, the issue of accountability further evolved by attempting to end the practice of giving poor children a watered-down curriculum (Riley, 2002). Money continued to flow to states to accomplish the eight goals (U.S. Dept of Education, 2002).

In Texas during this 1993-1994 time frame, students in grades 3-8 and 10 (exit level) were tested in reading and mathematics, and students in grades 4, 8, and 10 (exit level) were tested in writing (TEA Policy Research Report 9, 1997). The testing move from fall to spring provided a more accurate gauge of student learning for the school year. Results for state evaluation of district and campus performance were also made available before the start of the next school year. The TAAS also expanded covering a fuller range of the state curriculum. Science and social studies tests were added to the original program of testing in reading, mathematics, and writing. New end-of-course examinations were planned for students completing Algebra 1, Biology 1, English 2, and United States History (TEA Policy Research Report 9, 1997). In the spring of 1994, the end-of-course tests for Biology 1 and Algebra 1 were benchmarked (TEA Technical Digest, 2001). The Biology end-of-course exam was administered in December 1994 to students who had completed Biology at the end of the first semester. In the spring of 1995 the Biology 1 exam was administered and the Algebra 1 exam was re-benchmarked as a more rigorous and comprehensive test.

It was also in 1994 that the National Center on Educational Outcomes (NCEO) suggested that 85% of all students with disabilities could and should participate in regular or state assessments. Only a small portion of this 85% might need accommodations or modifications to participate even with their disabilities (NCEO, 1994). The remaining 15% of students with disabilities might need to participate in an alternative assessment. This remaining 15% of the special education population was only 1% to 2% of the total school population. At the time of the study, 10% to 15% of the total school population was estimated to be excluded from regular testing.

Evolution of TAAS continued in 1997 when the new Texas Essential Knowledge and Skills (TEKS) replaced the essential elements of the state-mandated curriculum (TEA Policy Research Report 9, 1997). In the spring of 1997 Spanish versions of TAAS were benchmarked for grades 5 and 6 reading and mathematics and for the grade 4 writing exam. The English 2 and U.S. history end-of-course exams were benchmarked in the spring of 1998 (TEA Technical Digest, 1997). These two examinations were again administered in the fall of 1998 to students who had completed the courses.

It could not be emphasized enough the impact of the 1997 Amendments to *IDEA* on the inclusion of children with disabilities in high-stakes standardized testing. These amendments required states to develop policies to allow students with disabilities to take part in state and district-wide standardized testing programs (O'Neill, 2000). *IDEA* also mandated alternative assessment for students with disabilities who were unable, even with accommodations, to participate in grade level standardized assessment (O'Neill, 2000). The official position of the U.S. Office of Special Education Programs had been that most students with disabilities should be included in general standardized assessment programs (Hehir, 1999 in Grubbs, 2000). A cautioned caveat to this position was that the use of over-accommodation, over-modification, and overuse of out-of-level testing could lead to outcomes incongruous with the intent of *IDEA 97*.

Texas addressed the federal policy with the passage of House Bill 1800 in 1997 (Grubbs, 2000). This bill, passed by the 75th Texas Legislature, created a major shift in Texas's treatment of students with disabilities on the Texas assessment instrument. Prior to this bill each individual student's Admission, Review, and Dismissal (ARD) committee determined the appropriateness of taking the state assessment, but the

scores of any student with disabilities who took the state test were automatically disaggregated from any public reporting including the Academic Excellent Indicator System (AEIS). This bill required that the scores for any student with disabilities who participated in the TAAS test be included in the school's accountability subset with all other students. The 1997 amendments to *IDEA* stopped short of requiring the states to include these scores in the formal accountability system. This began with the 1999 campus and district accountability ratings. There were also provisions to develop and provide an alternative assessment for those students with disabilities who would not participate in the TAAS test (Grubbs, 2000).

In general it was policy that alternative assessment was suitable only for those students who had a significant need. Subsequent to the 1997 amendments the Offices of Special Education and Rehabilitative Services and the Office of Civil Rights drafted a written response that addressed this issue. Both the Assistant Secretary of the Office of Special Education and Rehabilitative Services and the Assistant Secretary of the Office of Civil Rights indicated that the alternative assessment was only for a small number of students (Heumann & Cantu, 1997). Guidelines were issued to assist in the determination of eligibility for SDAA (Grubbs, 2000).

State-Developed Alternative Assessment (SDAA) and Reading Proficiency Tests in English (RPTE) were field-tested in the spring of 1999. SDAA assessed students received instructions in the TEKS at their appropriate instructional level rather than their actual grade level as determined by the ARD committee. The baseline RPTE was administered in the spring of 2000. Baseline testing was the first live test from which data was collected to determine individual measures of growth. It was also in the spring

of 2000 that SDAA was field-tested for a second year. In fall of 2000, the RPTE was studied to gather data to be used in the development of a system documenting the annual progress of Limited English Proficiency (LEP) students. In the spring of 2001 the SDAA was again administered as a baseline procedure (TEA Technical Digest, 2001).

The 76th Session of the Texas Legislature, in 1999, passed Senate Bill 103 (TEA Technical Digest, 2001). Planning for the new program, the Texas Assessment of Knowledge and Skills (TAKS), was initiated in the fall of 1999 (Commissioner's Rules, 2002). This legislation moved the exit level exam from grade 10 to grade 11 (TEA Technical Digest, 2001). The new grade 11 exam would assess students in English language arts, mathematics, science, and social studies. Students would be required to pass all four exams to obtain eligibility for a diploma. Content of the test must include at least English 3, writing, Algebra 1, geometry, biology 1, and integrated physics and chemistry.

Further mandates of Senate Bill 103 required that students in grades 3 through 10 be assessed in mathematics. Grades 8 and above would use technology when taking the examinations. Reading was to be assessed at grades 3 through 9. Grades 4 and 7 took the writing exam. English language arts, including writing, were to be assessed at grade 10. Assessments also included social studies at grades 8 and 10 with grades 5 and 10 taking a science examination (TEA Technical Digest, 2001). The first administration began during the 2002-2003 school year.

The 76th Session of the Texas Legislature, as part of the Student Success Initiative and complementing Senate Bill 103, also passed Senate Bill 4 (Nelson, 2000). This bill made sweeping changes to student promotion requirements. Senate Bill 4

mandated satisfactory performance on the grade 3 reading assessment, the grade 5 reading and mathematics assessment, and the grade 8 reading and mathematics assessment (TEA Technical Digest, 2001). This satisfactory performance became the requirement for promotion to the next grade level. The law would initially impaced the kindergarten class of 1999-2000 and all subsequent classes.

This class, during the 2002-2003 school year as third-graders, was required to pass the reading portion of the statewide assessment to qualify for promotion to the fourth grade (Nelson, 2000), (Commissioner's Rules, 2002). In fifth grade, beginning in 2004-2005, students must pass both the reading and mathematics exams. In school year 2007-2008, eighth-grade students must again pass both the reading and mathematics exams to be eligible for promotion. To reiterate, requirements were mandated that a student may advance to the next grade level only by passing these tests or by unanimous decision of his or her grade placement committee if the student was considered likely to perform at grade level after accelerated instruction. The substantive and procedural requirements for grade advancement were specified in TEC § 28.0211.

No Child Left Behind

Reform continued under President George W. Bush. In his second day in office, the No Child Left Behind plan was unveiled (Paige, 2002). This plan was designed to be a guide for Congress when reauthorizing the *Elementary and Secondary Education Act (ESEA)*. The plan was to use the same reform principles in place in Texas and be driven by *NAEP* statistics. It was suggested that most of the progress in student performance was made in the 1970s with little improvement since then.

On January 8, 2002, President Bush signed into law the *No Child Left Behind Act of 2001 (NCLB)* (Paige, 2002). The four basic reform principles of this act were stronger accountability for results, increased flexibility and local control, expanded options for parents, and an emphasis on teaching methods that had been proven to work (U.S. Department of Education, 2002). In regards to accountability, Paige (2002) suggested that a good system was vital and test scores should be used to track the progress of individual students so that teachers could tailor methodology to meet specific student needs.

Under *NCLB*, states created their own standards. Mathematics and reading standards were to be developed immediately. Science standards were to be in place by the 2005-2006 school year. When these standards were in place, states must test the progress of every student using tests aligned with the standards. By the year 2005-2006, tests must be administered every year in grades three through eight in mathematics and reading. In 2007-2008, science achievement was also be tested (U.S. Dept of Education, 2002).

Holding schools accountable under the *NCLB* required that test results be reported to the public. Student achievement on statewide tests would be disaggregated by subgroup, comparisons of achievement would be made, high school graduation would be reported, and the number and names of schools identified for improvement would be released. Additionally the professional qualifications of teachers and the percentage of students not tested would be examined and reported. School districts would be preparing annual reports for parents and the public in regards to the district and individual schools (U.S. Department of Education, 2002). This new law applied to

all children and included children with disabilities, behavior problems, minorities, immigrants, and English as Second Language (ESL) students (Wright, 2002a). An examination of the accountability aspects of *NCLB* led to a review of accountability and special education placement.

Under *NCLB*, if a school was found to be in need of improvement, school officials would receive help in the form of technical assistance. A two year plan was developed and every student in the school would be given the option to transfer to a better public school in the district. If the school did not make adequate yearly progress for three consecutive years, the school remained in school improvement and the district must continue to offer a choice option. Supplemental educational services must also be provided to disadvantage children. Parents could choose the services from a list of approved providers. If the school failed to make yearly progress for four consecutive years, corrective actions such as replacing staff or fully implementing new curriculum must be completed. The school must also continue to offer choice and pay for supplemental services. After five consecutive years with no progress, the school would be identified for restructuring. A plan must then be developed to implement significant alternative governance actions, state takeover, the hiring of a private management contractor, converting to a charter school, or significant staff restructuring (United States Department of Education, 2002). Accountability was at the very heart of *NCLB* and the student who receives special education services a pivotal centerpiece.

Accountability in Texas also continued to evolve. TEA subgroups, such as African American, Hispanic, white, and economically disadvantaged, were required to also meet minimum passing standards with minimum size requirements for each of

these groups. In addition to ethnicity and socioeconomic status, gender and special education status were considered student groups for determination of accountability ratings if minimum size requirements were met (TEA, October, 2003). Additionally, in 2002-2003, Texas included State Developed Alternative Assessment (SDAA) results in the AEIS reporting system. This was the transition year from the TAAS to TAKS (Grubbs, 2000).

There were also accountability evaluations conducted by the state that specifically targeted federal policy concerns using special education data submitted by the school districts. The Texas Education Code (TEC) required the Texas Education Agency to determine the special education compliance status (SpECS) of each school district in the state. A comprehensive system for monitoring school compliance with federal and state laws related to special education was adopted and implemented. This monitoring system provided for ongoing analysis of district special education data and of complaints filed with TEA concerning special education services. Data analysis was conducted in accordance with the Agency's Special Education Data Analysis System (DAS). Data Analysis System results then became a primary consideration in the process of selecting schools for District Effectiveness and Compliance (DEC) on-site monitoring visits (TEA, 2002, August 1). Beginning in 2003, special education compliance status would be printed on AEIS reports (TEA, October, 2003).

Research

There had been studies of student achievement and several meta-analyses of these studies. Many of the studies focused specifically on the relationship between expenditures and student achievement. Within these studies, a great many ancillary

factors had been researched that were suggested to impact student achievement. It was also important to note that many of these studies targeted all students while others focused specifically on the student receiving special education services.

General Research

Wollatt (1949) cited studies that had been undertaken as early as 1920. Research techniques varied but it was found that the most common technique was to compare educational quality for groups of schools in three expenditure levels. Higher spending was suggested to result in a higher quality experience in school. The *Coleman Report*, officially entitled *Equality of Educational Opportunity* (Coleman, et al., 1966) was the first serious attempt to examine student achievement in relation to school characteristics (Webb, 2001). The report sought to determine the extent to which differing expenditures affected the quality of education with a particular focus on school segregation (Alexander & Salmon, 1995). Wenglinsky (1997) reported that the study found little relationship between monetary input and outputs in terms of student achievement. Although the report had serious statistical errors (Payne & Biddle, 1999), its effect on educational research was extensive (Alexander & Salmon, 1995; Wenglinsky, 1998). Greenwald, Hedges, and Laine (1996) suggested that studies of this type, many times, produced mixed results and mixed conclusions regarding the relationship between educational inputs and outputs. It was the *Coleman Report* that initiated the use of production-function studies in education (Alexander & Salmon, 1995).

A number of economists, responding to the emerging doctrines of Friedman (1962) and Boulding (1972), began to study the relations conceived as the inputs and

outputs of public education (Payne & Biddle, 1999). Mosteller and Moynihan (1972) suggested that no study of educational opportunity or quality could be taken seriously unless it dealt with educational achievement or other accomplishments as the principal measure. Production-function or input-output analysis was based on the economic theories of U.S. industry. Precise increments of resource inputs that yielded specific increments of productions outputs were measured. It was valuable to industry but its use in education, under diverse conditions, resulted in confusing and contradictory results (Alexander & Salmon, 1995). There were several early studies where researchers began using production function models. Empirical studies were conducted with small samples as an effort to determine how efficiently outcome variables could be predicted (Webb, 2000).

One of the first studies of this type was done by Hanushek (1971). He attempted to determine what characteristics of elementary schools contributed to improved student achievement. It was suggested by the study that teacher experience and education do not predict higher student test scores. Results could not be generalized with this study as only one school district was involved. In 1972, Hanushek extended his research in a large-scale study of schooling and race. Single and multiple analyses were incorporated into the study. Single variable analysis suggested that class size, teacher experience, and teacher education did not influence student achievement. Multiple analyses suggested that total teacher experience had a positive but weak effect on achievement. Other localized studies ensued.

A 1972 study by Jencks concluded that student achievement was primarily determined by the entering students and not specific variables such as school budgets,

policies, or teacher characteristics. Heim and Perl (1974), used teacher experience, education, verbal ability, class size, administrator characteristics, and the use of technology as inputs in a study of 63 New York state school districts. Smaller class size predicted higher achievement in both reading and mathematics test scores. It was also inferred that although teacher education positively influenced test scores, teacher experience exerted no influence. Bargen & Walbert (1974) used variables such as class size and teacher quality rather than spending with mixed results. In 1974, Levin created a production-function model for educational outputs using teacher experience and teacher scores on a test of verbal skills rather than direct expenditures. The results were inconclusive. Browns and Saks (1975) study investigated school resources by focusing on estimates of both means and standard deviations of an index of fourth grade achievement. In this study the differences across community types (city, town, or rural) were controlled. Results of the study indicated that teacher education and experience had a positive and significant effect on student achievement (Webb, 2001).

With a greater emphasis on accountability, production function studies continued into the 1990s. During the evolution of these studies, however, policymakers and educational leaders changed the manner in which they looked at these studies. A new process known as meta-analysis was applied to statistical techniques to synthesize the findings from the many studies conducted (Webb, 2001).

In 1986 Childs and Shakeshaft, after conducting meta-analysis in the area of expenditures and achievement, categorized the studies into three areas. There were studies which indicated no relationship, studies which indicated a positive relationship, and studies which indicated a positive relationship only under certain conditions. This

particular meta-analysis included over 76 dissertations and over 400 publications that studied the relationship between educational expenditures and student achievement. The researchers concluded that the amount of money spent was not nearly as critical as how it was spent.

Hanushek (1989) concluded, after reviewing 65 studies, there was no significant relationship between school expenditures and student outcomes. Thirty-eight of the studies showed a positive relationship, but only 13 of these provided statistical significance. A 1990 study by Chubb and Moe produced the same conclusion that the availability of resources and student achievement had no statistically significant relationship.

A 1994 meta-analysis by Hedges, Laine, and Greenwald argued the necessity of increasing resources to produce demonstrative improvement in student achievement. These same researchers (Greenwald, Hedges, & Laine, 1966) suggested that it was not necessarily the amount but rather what the money was used to purchase. Money could furnish supplies, teachers, reduced class size, and technology all of which tended to positively impact student achievement. The contention was that the need for well placed resources could not be ignored. It was generally concluded that resources, in some manner, were related to student achievement. A further contention was that the statistical relationship was great enough to force the educational community to investigate these relationships when making educational decisions.

Non meta-analytic studies also continued. Ellinger, Wright, and Hirlinger (1995) compared data from Oklahoma school districts utilizing six predictor variables. Their research indicated that scores on tests of achievement tended to be higher when school

funding was higher. The variables identified in this study were revenue, minority percentage, free lunch percentage, teacher salary, teacher degree, and teacher experience. The dependent variable used in the multiple regression analysis was 11th-grade standardized test scores. This was a two year study, and the major finding was that achievement test scores tended to be higher when school funding was higher, even when student race, family socioeconomic status, and selected teacher characteristics were held constant.

Some critics of school spending claimed that scores declined despite increased expenditures. Some suggested that states were making efforts to equalize the amount of money that was spent in school districts even with differences in demographics across the districts. Sanders (1993) conducted research that suggested equalized spending had not necessarily indicated equal schools. Bracey (1997) revealed that nationwide the average student receiving special education services cost a district as much as 2.3 times as much per year as a regular student. Bracey also reported that 12% of all students in the country received some type of special education services. Additionally, because of the widely diversified locations of schools and their student populations, the cost for education varied drastically from district to district.

Swetnam's 1992 study found and identified differences in four categories of district wealth and the percentage of economically disadvantaged students. He found direct relationships between expenditures and achievement in certain subject areas. This relationship was especially true in the area of mathematics. The study also found a direct relationship between teacher salary and mathematics achievement. The most prevalent relationship found was between district wealth and student achievement.

Furthermore, how the money was spent was found to be much more significant than how much. Harter (1999) also concluded that it was not the amount of money spent, but the differences in spending that impacted achievement. In particular, it was suggested that types of expenditures played an important role in explaining differences in student achievement. Money that was spent on classroom supplies and maintenance, in most instances, made more of a difference on student achievement than money spent on payroll. Resource allocations appeared to be the key to this relationship. A 2001 study by Webb refuted this conclusion finding a positive relationship between payroll and student achievement. Borland and Howsen (1996) found that teacher quality, in terms of years of experience, could have an impact on student achievement. They suggested when some school districts offered incentives for student performance; student achievement could have an impact on teacher salaries. A 1999 report by Coate and Vanderhoff investigated data from the 1988-1989, 1992-1993, and 1994-1995 school report cards in New Jersey high schools to determine if a relationship between achievement and expenditures existed. No evidence was found.

Sanders (1993) found that real expenditures per pupil, in average daily attendance in the United States between 1960 and 1989, experienced a 186% increase. During this same period of time, the country had attempted to raise the achievement standard that actually indicated an improvement in student achievement. Test scores had been compared state to state and country to country. This study referenced the school reform that really began in earnest with the 1983 *A Nation at Risk* report. A dim picture of public education was suggested and resulted in an avalanche of scrutiny place on public schools (Hanushek, 1994).

Educators had been expected to achieve monumental gains with relatively small amounts of revenue. A policy objective of the government continued to mandate maximized learning without an increase in allotment (U.S. General Accounting Office, 1995). In laymen's terms, schools had to use what was available and make the most of it. As a result, budget manipulation at the local, state, and federal levels resulted in school board attempts to increase test scores and limit spending simultaneously. Low tax rates kept the public happy, and a satisfied public voted for those who honored the low rates. Another focus on the property tax suggested that they were becoming less and less fair as people invested more and more of their surplus monies in other forms of tax sheltered wealth (Burrup, Brimley, and Garfield, 1993). The courts recognized the fact that disparities and inequalities exist. These disparities continued to exist between schools within the same district and between districts. For several decades educators had acknowledged the intertwining of education with a much broader political process at the local, state, and federal levels (Cambron-McCabe & Odden, 1982). Education no longer was viewed as a closed system isolated from the political arena.

Literature findings continued to be mixed regarding the relationship between expenditures and achievement (Harter, 1999). With little increase in funding, it was evident that there would be zero student gain. The suggested caveat was that ideal allocation of funds was still a moving target. Sufficient resources had always been necessary for schools to provide any type of desired educational opportunities (Greenwald, Laine, & Hedges, 1996). It was argued that increased spending without changes in operation and management would offer little in the way of improving student performance.

Shibler (1997) conducted a rather unique study to determine if recommendations made by the *A Nation at Risk* report had made significant differences in Michigan schools. Analysis determined the extent to which the reforms had been implemented. Further analysis was conducted to determine relationships between the implementation of reform efforts and several fiscal and demographic variables such as per-pupil funding, district size, and district type.

Relationships were identified between per-pupil spending and increased allocations for per-pupil expenditures and master teacher programs. There was also a significant relationship between per-pupil funding and the increase in the number of minutes per day of instruction. A relationship was also identified between enrollment and recommendations related to master teacher programs, foreign language requirements, computer science requirements, competency testing requirements, salary increases, length of school day, and lengthened school year. Additionally a relationship was determined between school size and perceived effectiveness of lengthened school year, effectiveness of salary increases for certified staff, and the impact of alternative education programs (Shibler, 1997).

Rural, suburban, and urban labels were used to categorize districts in this study. Relationships were found between these district types and recommendations for improvements in English, social studies, foreign language, computer sciences, and length of school day (Shibler, 1997).

Special Education

Studies had also been conducted incorporating the use of variables associated with the student receiving special education services. A study conducted in Alabama

examined data from Alabama public schools and investigated the possibility of correlations between local funding effort and student achievement (Smith, 1999). Local effort and the impact on Stanford Achievement Test (SAT) scores provided an emphasis for the study. Local variables used were dollar yield per ADA, number of mills or equivalent, student-teacher ratio, percentage of students in special education programs, and type of school system (city or county). The dollar yield per ADA was the dollar amount yielded from all sources (property tax, other tax, and fees). Student-teacher ratio was the number of students in the school system divided by the number of teachers in the school system. The Smith (1999) research used multiple regression analysis in grades four and ten to analyze the data. Using 1995 data, the dollar yield per ADA, student-teacher ratio, and type of school system were significantly related to student SAT scores. The 1995 coefficients were then used to perform a cross validation of the regression equation to estimate 1996 SAT scores. A high correlation was shown when the estimated and actual 1996 scores were compared. Net changes in scores from 1992-1996 were studied longitudinally and revealed a significant relationship between decreased student-teacher ratios and improved SAT scores.

This study suggested that greater wealth as measured by dollar yield per ADA was associated with lower class sizes, greater effort in terms of more mills or equivalent mills levied locally, and higher SAT scores. City schools also had higher SAT scores. Total funds per ADA and a low student-teacher ration were positively related to test scores. In the area of special education, this study suggested that a higher or lower-than average percentage of students receiving special education services was not determined to be significantly related to student test scores.

A study conducted by Shive (2000) for the state of Florida examined data from three consecutive school years to investigate the effect of school resources on student outcomes. It examined the variation between resources and test scores (reading and mathematics) within schools over time, across schools within a district, and across districts within the state. School level variables used in the study were student demographics, student academic potential, faculty demographics, and faculty quality. The school environment characteristics incorporated in the study were global measures (class size, enrollment, regular per-pupil spending), peer environment or atmosphere, and community type. The community types were derived from the 1990 census. The smallest three (large towns, small towns, and rural) were collapsed into one category. The other categories represented were large cities, smaller cities, the fringe of large cities, and the fringe of smaller cities. District characteristics studied were socioeconomic status and community effort (average teacher salary, local per-pupil revenue) (Shive, 2000).

The Shive study supported the position that socioeconomic status was a substantial predictor of student performance. The study also found that schools which had higher concentrations of African-American students had lower test scores. Spending for special needs students (i.e. special education, gifted and talented) had insignificant impact on test scores but actual gifted enrollment showed a positive and strong correlation (Shive, 2000). Additionally, the proportion of handicapped students had no statistically significant impact on test scores.

Class size produced no significant relationship, and enrollment results were inconsistent. Regular per pupil spending showed consistent negative significance. Shive

conjectured that this might be the result of the influence of large urban schools and that these schools exerted a great deal of weight on the overall findings from a model using statewide data. Suspensions were also consistently and negatively significant. In regards to community type, no variable showed significance for reading outcomes. There was a statistically positive impact shown for math outcomes and medium-sized cities. While it could be suggested that lower mathematics scores would come from large urban areas, the author suggested that the effects of suburban schools neutralized the negative influence of inner-city schools (Shive, 2000).

At the district level, the coefficient on district level socioeconomic status was always positive and significant. Shive suggested, possibly as a result of controlling for variation at the lower level, that districts with higher levels of poverty tended to have higher scores. Average teacher salary was consistently insignificant as was per-pupil revenue from local sources. A suggested reason for this finding was that statistical models possibly had not been able to capture the effect of differences in effort across communities because of the diluting effect of compensatory funding. Shive (2000) recommended additional strands of similar research using the achievement results of specific groups. An example would be to use his model with the test results of major race or ethnicity categories.

The purpose of a 2000 study by Webb was to determine if a relationship existed between financial resources and the academic achievement of students in the public schools of Georgia. The four financial variables were per pupil expenditure, average teacher salary, per pupil local revenue, and per pupil district wealth. These financial variables were researched in relation to passing rates on the Georgia High School

Graduation Test (GHSGT). Other variables considered were socioeconomic status, race, and special education enrollment. The study produced rather inconclusive results. Average Teacher Salary was statistically significant showing a moderate but positive relationship with passing rates. The other financial variables (per-pupil expenditures, per-pupil district wealth, and per-pupil local revenue) had only a weak relationship with academic achievement. It was worth mentioning that per pupil expenditure had a weak but negative relationship with the passing rate. Two control variables in the study also showed some significance. Socioeconomic status showed a rather strong relationship and race showed a moderate relationship with the passing rate. Another covariant, special education enrollment had only a weak positive relationship with the passing rate and was statistically insignificant. Summary statistics, in regards to special education enrollment, produced no statistically significant association with any of the variables used in the study. Noteworthy was the fact that special education enrollment varied little by district. Per pupil local revenue and race were also found to moderate the relationship between socioeconomic status and the Georgia High School Graduation Test passing rates (Webb, 2000).

A dissertation completed by Hudson (1999) sought to determine if there were statistically significant differences between students with disabilities who passed and those who failed a high school proficiency exam in Nevada. Specifically the question was whether or not differences were accounted for by demographic variables alone or if they were also attributed to educational variables. Demographic variables included gender, ethnicity, type of disability, length of time in the district, number of schools attended, a cognitive skills index, and parent occupation. Education variables were

considered to be number of credits, cumulative GPA, past testing results, and types of classes taken. This study revealed a statistical significance for ethnicity, number of schools attended, cognitive skills index, parents occupation, number of credits, past testing results, and types of classes taken. Results indicated that there were significant differences between the backgrounds of students with disabilities who passed and those who failed, and that these differences were affected by both demographic and educational variables. It was also found that students with disabilities enrolled in general education classes were more likely to pass than students who took mostly special education classes. This conclusion suggested the need to examine the policy of inclusion of the student receiving special education services in the regular classroom and general curriculum (Hudson, 1999). As early as the 1980s a study suggested that increased test scores on the Texas testing instrument were most likely due to factors other than actual learning (Mangino, Battaile, & Washington, 1986). One of the problem areas identified was the high percentage of students exempted from the testing as a result of special education placement. It was suggested, in this study, that a school could have better overall testing performance by placing more students in special education.

A 1999 study by Handlogten investigated the testing exemptions of students receiving special education services in Texas. The perceptions of 31 special education directors of state department programs were compared with the perceptions of 176 Texas special education directors concerning the impact of including students with disabilities' achievement test scores in state and local accountability systems. Results of the study suggested that administrators and school officials were concerned about low

school accountability ratings when the scores of students with disabilities were aggregated with the scores of students without disabilities. In Texas, the percentage of students with disabilities who receive alternative assessments had risen. This suggested that large numbers of students with disabilities were excluded from mandated achievement tests.

Additionally, Handlogten (1999) reported that the study supported the stance of Langenfeld, Thurlowe, & Scott (1997) and McQueen (1999) that school officials were so concerned about the reported outcomes and accountability ratings that tests results had been knowingly manipulated. Zlatos (1994) also suggested that, because of pressure on schools to show high achievement, students with disabilities were often excluded when schools fell prey to the temptation to make scores look artificially good. In this study, when the scores of students receiving special education services were used to calculate passing percentages, passing rates dropped from 96% to 78% (Zlatos, 1994). Score manipulation, coupled with possible excessive identification of students to receive special education services suggested that either the scores were manipulated or children were incorrectly excluded from high stakes standardized testing (Handlogten, 1999). While this concern had been substantiated in some Texas districts, the question may have been to what extent and how counterproductive it had been in regards to improving the academic achievement of the student receiving special education services.

Deere & Strayer (2001) conducted studies that produced results similar to those of Handlogten (1999). These studies also examined high stakes statewide testing in Texas. The researchers suggested that schools had placed a much greater emphasis

on tests that are used to calculate accountability ratings relative to standardized testing that had no bearing on accountability ratings. Students who failed the test in one year were more likely to be exempted from the test the next. It was found that when the state counted the scores of students receiving special education services taking the regular TAAS exams, the percentage of students receiving special education services and percentage of students receiving special education services exempted from the testing increased. The data in this study strongly suggested that strategic exemptions of lower ability students occurred.

A Figlio and Getzler (2002) study of high stakes testing in Florida provided additional information to support the contentions of Handlogten (1999), and Deere and Strayer (2001). This study examined data to determine whether or not the initiation of the Florida Comprehensive Assessment Test (FCAT) had affected special education assignment decision making. Low students in tested grade levels were placed in special education at a much higher rate than those in grade levels not tested. It was also found that high poverty schools were significantly more likely to reclassify low-achieving students than wealthy districts. Citing similar research conducted by Jacob (2002) as well as Cullen and Reback (2002), Figlio and Getzler suggested that schools responded to accountability ratings by the special education reclassification of marginal students. Jacob (2002a & 2002b) studied Chicago schools and found that the percentage of students exempted increased after the introduction of high-stakes standardized testing. Lower-scoring students were the predominate members of the exempted individuals. The Cullen and Reback (2002) study produced similar findings and again suggested

that schools responded to accountability incentives by reshaping the test pool (Figlio & Getzler, 2002).

Not all studies examined suggested the inappropriate or unethical exemption of students receiving special education services from standardized testing programs. A 2000 study by Grubbs took a different approach and produced different findings. In this study the identification and achievement of students receiving special education services was analyzed. This study investigated the differences in special education populations across the four campus ratings used by the Texas accountability system. The findings suggested that the academic accountability system in Texas was not over-identifying students with disabilities or over-exempting these students to receive a higher accountability rating. Results indicated that special education identification percentage rates for the highest rated (exemplary) campuses were lower than for any of the other three accountability ratings. Fewer students were exempted by the exemplary campuses and conversely the lowest rated (low performing) campuses had the highest identification and testing exemption rate.

Cameron (2000) conducted a study analyzing district per pupil expenditures on selected indicators of the state accountability system. Per pupil expenditures, both instructional and administrative, were analyzed using the TAAS scores, attendance rates, dropout rates, the percentage of students receiving special education services, and the total number of students enrolled in the district.

The Cameron (2000) study did reveal a relationship, although not significant, between instructional per pupil expenditures and TAAS scores, attendance rates, special education percentage, and total number of students. Weak significance was

also found between administrative per pupil expenditures and TAAS scores, attendance rates, and special education percentage. The combined relationship on expenditures was found to be small. There were additional findings of interest that showed some low to moderate relationships. TAAS scores and attendance rates produced a moderate positive relationship. A moderate negative relationship was suggested to exist between dropout rates and attendance rates. A low negative relationship was revealed between TAAS scores and dropout rates.

A similar study was conducted by Clark in 2002. In the Clark study, the effect of expenditures, broken down by the eight functional expenditure groups (instruction and instructional-related services, school leadership, student support services, general administration, non-student services, ancillary services, debt service, and facilities acquisition) was examined in relationship to student achievement using campus ratings (exemplary, recognized, academically acceptable, and low-performing), actual TAAS scores, seven demographic variables (African-American, Hispanic, white, other, limited English proficient, economically disadvantaged, special education, gifted and talented, and career and technology), and property wealth. Instruction, student support, general administration, non-student services, and ancillary services were significant in terms of AEIS ratings. Post Hoc testing did not produce consistent differences among the groups. More resources for instruction generally produced higher test scores. Increased, targeted instructional expenditures for higher percentages of minorities, special education, bilingual, and gifted and talented resulted in higher campus ratings.

Greene and Forster (2002) conducted a study of state funding systems and high stakes testing on special education enrollment that supported the Grubbs (2000)

research. Regression analysis conducted in this study suggested no statistical significance between special education enrollment and high-stakes testing. Although not statistically significant, there was a negative correlation between special education enrollment and test scores. These results indicated that states with high-stakes testing actually had lower rates of special education placement. There was a statistically significant relationship suggested between a states' special education enrollment rate and whether or not the funding formula provided a fiscal incentive for special education placement. States with lump sum systems of fiscal reimbursement for special education added 1.24% to their special education populations. States with bounty systems, giving extra weight to students receiving special education services for the purpose of funding, increased this population of students by 6.2%.

Although the Clark (2002) and Greene and Forster (2002) studies provided moderate support for Grubb's findings, the studies and reviews of the available literature generally supported Handlogten's (1999) contention of the excessive identification of students for special education services (Chavez, 2002; Deere & Strayer, 2001; Figlio & Getzer, 2002; Fries, 1998; Lombard & Burke, 1999; Lamping, 2001;). Parrish (2002, December) responded to the Greene and Forster (2002) study and suggested that special education identification was less likely to be impacted by how high the stakes were for the schools, than how the student receiving special education services was counted and reported in the results. He used the Kentucky testing program as an example. In this state, the placement of a student in special education had not exempted the district from fully assessing education outcomes. It also did not exempt districts from including the results in the average scores reported for all students. As a

result of this, special education was not considered a place to hide from accountability or public reporting. Exacerbated accountability requirements for these students suggested a need to continue to identify current trends and the associated issues (Grubbs, 2000). This was reinforced by an examination of TEA data.

Since 1994, there had been a dramatic increase in the number of school campuses and districts rated exemplary. In 1994 there were only 67 schools with this rating, but by 1998 the number had risen to 1,042 and 1,110 in 1999 (Caddell, 1998; TEA, 1999). The 2001-2002 school year produced 1921 exemplary campuses (TEA, 2002a). Inversely, as the number of exemplary campuses increased, the number of students identified with disabilities and receiving special education services increased. From 1994-1998 the total public school enrollment rose from approximately 3.6 million students to approximately 3.95 million. This translated to a 9% increase. In this same time period, students served in special education rose from 385,126 to 476,712. This represented an increase of over 19%. From 1998 to 1999 the increase in TAAS testing exemptions rose from 106,529 to 144,473 (TEA, 1999). In the 2001-2002 school year there were 301,432 students receiving special education services in grades 3-8 and 10 (TEA, 2002b). Of this number, 89.4% were tested, but 48.5% of these students took the SDAA, 8.1% were ARD exempt, and 10.6% were not tested. This resulted in only 22.2% of this particular population of 66,917 students who participated in the regular assessment portion of the state testing program. At the federal level, data suggested that less than 50% of students with disabilities actually participated in any state assessment (Thurlow, Elliott, & Ysseldyke, 1998).

Summary of the Literature

The historical development of special education mirrored the policy developments and accountability associated with the civil rights movement. It could be suggested that these developments provided a substantial impetus for the current state of sustained school reform. Within this context, factors suggested to impact the academic outcomes of the student receiving special education services was examined.

Being accountable in regards to special education was nothing new. Initially this accountability focused on the procedural aspects as revealed in the 1982 *Board of Education vs. Rowley* decision. This emphasis centered on monitoring information on the number of students with disabilities, due process, and eligibility as well as proper implementation of programs. For many years, this focus continued to specifically target adequate educational inputs and processes (Erickson, 1998). Subsequently, school reform dictated an expansion of this focus to include accountability in the form of academic outcomes for the student receiving special education services (Parrish, 2001). The caveat was, researchers have yet to determine what an adequate special education looks like (Parrish, O'Reilly, Duenas, & Wolman, 1997). Recent studies that have targeted Texas (Handlogten, 1999; Cameron, 2000; Grubbs, 2000; Deere & Strayer, 2001; Clark, 2002) produced inconsistent findings.

CHAPTER 3

METHODOLOGY

Research Design

This study sought to determine if a statistically significant relationship existed between selected data from the Academic Excellence Indicator System (AEIS) comparing the TAAS scores of students receiving special education services with selected district demographic, fiscal, and special education data. It was a quantitative research design incorporating regression analysis as the statistical procedure. Included in the reading analysis of this study were 896 Texas school districts. The mathematics analysis used data from 914 school districts. There were two criterion variables and ten predictor variables separated into three groups for each of the analyses. This exceeded recommendations that the researcher, utilizing regression analysis, have 15 to 20 times the number of cases as variables (StatSoft, 2004). Specifically a hierarchical regression model was used to accomplish the analyses. The percentage of students receiving special education services passing the grades 3-8 and 10 reading and mathematics TAAS exams (criterion variables) were analyzed in relation to specific AEIS indicators (predictor variables). Predictor variables were grouped as general district demographics, district fiscal variables, and district special education demographics.

The general district demographic variables analyzed were district community type, district enrollment, district socioeconomic status, and district ethnicity. These variables were included in yearly district AEIS reports and used in a number of other studies reviewed (Coleman, 1966; Shibler, 1997; Smith, 1999; Shive, 2000; Webb, 2000; et al.). District socioeconomic status and district ethnicity, had also impacted

district accountability ratings. The district fiscal variables examined were district instructional expenditures per pupil, district instructional expenditures per student receiving special education services, and district wealth. These variables were also reported in yearly AEIS reports and referenced in the review of literature (Childs & Shakeshaft, 1986; Chubb & Moe, 1990; Hedges, Laine, & Greenwald, 1994; Swetnam, 1992; Coate & Vanderhoff, 1999; Smith, 1999; Shive, 2000; Webb, 2000; Clark, 2002; et al) District special education demographic variables included in the study were the district percentage of students receiving special education services, district percentage of students receiving special education services taking the grades 3-8 and 10 reading TAAS exam, district percentage of students receiving special education services taking the grades 3-8 and 10 mathematics TAAS exam, and the district special education data analysis system rating. As with the other two groups, these variables were reported in district AEIS data. They were also extensively referenced in studies that specifically targeted the student receiving special education services (Mangino, Battaile, & Washington, 1986; Handlogten, 1999; Grubbs, 2000; Clark, 2002; Figlio & Getzler, 2002, April; Greene & Forster, 2002, December; Cameron, 2000; Webb, 2000; Handlogten, 1999). Data was collected and analyzed to determine the absence or presence of a statistical relationship.

Research Questions

Research Question 1. Is there a relationship between the percentage of grades 3-8 and 10 students receiving special education services who pass the reading TAAS exam and district community type, district enrollment, district socioeconomic status, district ethnicity, district instructional expenditures per student, district instructional

expenditures per student receiving special education services, district wealth, district percentage of students receiving special education services, district percentage of students receiving special education services taking the exam, and district special education data analysis system rating?

Research Question 2. Is there a relationship between the percentage of grades 3-8 and 10 students receiving special education services who pass the mathematics TAAS exam and district community type, district enrollment, district socioeconomic status, district ethnicity, district instructional expenditures per student, district instructional expenditures per student receiving special education services, district wealth, district percentage of students receiving special education services, district percentage of students receiving special education services taking the reading TAAS exam, district percentage of students receiving special education services taking the mathematics TAAS exam, and district special education data analysis system rating?

Population

The population for this study was taken from data reported to the Texas Education Agency by public school districts in the state of Texas. It consisted of all 2001-2002 grades 3-8 and 10 Texas public school students in the selected districts. Charter schools, special-purpose statutory districts (those with no wealth or department of defense districts), and any state-administered districts were excluded. Districts with masked data as a result of confidentiality issues or zero numbers, which resulted in undefined or indeterminate mathematical computation, were excluded from analysis. This resulted in 896 districts selected for the reading analysis and 914 selected for the mathematics analysis.

Variables

For each regression, this study used two criterion variables and ten predictor variables. The criterion variables were district percentage of grades 3-8 and 10 students receiving special education services who passed the reading TAAS exam and district percentage of grades 3-8 and 10 students receiving special education services who passed the mathematics TAAS exam. The predictor variables were district community type, district enrollment, district socioeconomic status, district ethnicity, district instructional per pupil expenditures, district instructional expenditures per special education student, district wealth, district percentage of students receiving special education services, district percentage of grades 3-8 and 10 students receiving special education services taking the reading TAAS exam, district percentage of grades 3-8 and 10 students receiving special education services taking the mathematics TAAS exam, and district special education data analysis system rating. This study made use of the Public Education Information Management System (PEIMS) computer-based data bank for the 2001-2002 school year, a system used and maintained by the Texas Education Agency (TEA). The variables were grouped as general district demographic variables, fiscal variables, and district special education variables.

Procedures for Data Collection

This study used data from the 2001-2002 District Academic Excellence Indicator System (AEIS). The data was requested from TEA as a special data pull with districts sorted by county district number, a specific six digit number assigned to each individual school district. After each variable was defined, statistical analysis using multiple regression was conducted.

Data Analysis

Once the data was collected, statistical tests were conducted to aid in the formulation of discussion based on the research questions and hypotheses of the study. Summary statistics and correlation coefficients were computed. Multiple linear hierarchical regression was chosen for statistical analysis. This method analyzed the collective and separate contribution of two or more independent variables to the variation of a dependent variable. Independent variables were identified as predictor variables and dependent variables were identified as criterion variables.

This hierarchical analysis constituted a series of simultaneous analyses, all of which used the same criterion. The initial analysis contained one or more of the predictor variables. The second analysis added one or more new predictors to those used in the first analysis, and so on with each subsequent analysis in the series. The change in R^2 between each consecutive analysis represented the proportion of variance in the criterion that was shared exclusively with the newly added predictor. Hierarchical analysis calculated semipartial correlations (Licht, 2003). This analysis answered the questions posed by this research by the statistical control (partialing) of the predictor variables as each block was entered. The assignment of these variables to groups controlled for similar subject variables by equally distributing them across their respective groups (Grimm & Yarnold, 2003)

The multiple linear regression equation formed by this analysis would be of the form $Y= b_1X_1+b_2X_2+\ldots+b_kX_k+a$. The regression coefficients or β coefficients, (b_1, b_2, b_3, … b_k) represented the independent contributions of variables to the prediction of the dependent variable. This coefficient provided the correlation after controlling for all other

independent variables (Statsoft, 2004). In addition to the production of the regression equation an index, identified as *R*, of the relationship between the criterion and the weighted combination of the predictors, was calculated (Grimm & Yarnold, 2003). This *R* value was the bivariate correlation between the observed scores on the criterion and scores suggested by the regression equation. Mathematically, this multiple correlation coefficient (*R*) provided a Pearson product-moment correlation coefficient between the criterion variable (Y) and the predicted score on the criterion variable ($\hat{Y}$), which is a linear combination of the predictor variables. This equation was represented mathematically by $\hat{Y}= b_1X_1+b_2X_2+\ldots+b_kX_k+a$.

Critical to regression analysis is the R^2 value. These values were computed, one at each stage of the analysis, as individual independent variables or sets of independent variables were added (Huck, 2000). This value resulted in a percentage of total variation in the criterion variable that could be explained by the predictor variables. At each step of the reading and mathematics analysis the examination of these R^2 values, and the associated change in R^2, represented the proportion of variance in the criterion that was shared exclusively with the newly added group of predictors (Licht, 2003). This R^2 then is the proportion of the variation in the criterion variable that was attributed to the variation of the combined predictor variables as each block was entered (Hinkle, Wiersma, & Jurs, 1998). Adjusted R^2 values were also calculated with each analyses. This value removed any bias associated with R^2 if the calculations were based on a sample set of data rather than a population (Huck, 2000). These adjusted R^2 values were not needed because of the large number of districts researched and the fact that none of these values were significantly lower than the original R^2.

Squared structure coefficients (*structure* r^2) were then calculated for this and all subsequent regression iterations. Squared structure coefficients revealed to the researcher the proportion of the criterion variable (only the explained portion) variance explained by the predictors (Thompson, 1994). They were calculated by dividing the Pearson *r* by *R* and squaring the result. It was a correlation of the predictor with $\hat{Y}$ (the predicted criterion or synthetic variable) and provided a better understanding of what the synthetic variable, derived by weighting the observed variables, really was (Thompson and Borrello, 1985). The position taken by Thompson (1992) was that researchers were best served by interpreting both the beta weights and the structure coefficients or both the beta weights and the bivariate correlations of the predictors with *Y*.

To reiterate, the R^2 values indicated the percentage of the variance in the criterion variable explained by the predictor variables. The Beta weights (β) were a multiplier for each predictor indicating that the predictors contributed. It was interpreted as the amount of change expected to occur in the criterion variable per unit change in the predictors (Licht, 2003). Squared structure coefficients (*structure* r^2) explained the percentage each predictor individually impacted the explained portion of variance. Beta weights and structure coefficients produced nonzero values at each step of this analysis which, according to Thompson (1992), indicated an overlapping of the predictors' contribution to the variance in the criterion variable.

A critical consideration in the use of hierarchical regression was the order in which variables were entered. This order determined which variables were partialed or controlled. Variables entered early in the series had their effects partialed from relationships involving variables entered in subsequent steps. As a result, partialed

indexes from different steps in the regression did involve the exact same sets of variables and were not directly comparable to one another. In hierarchical regression the order of entry was at the discretion of the researcher. The researcher determined which and how many variables were added at each step and thus determined the number of analysis in the series as well as when to terminate the model (Licht, 2003).

Data was entered in blocks with an investigation of the changes in R^2 as each block was entered. The identified variable groups district demographics, district fiscal, and district special education demographics comprised these data blocks. The blocks were entered in this order based on the research which determined groupings and AEIS reporting.

An important assumption associated with linear regression was the normal or uniform distribution of data. A skewed distribution has many scores at one end of the scale of measurement and progressively fewer scores at the other end (Hinkle, Wiersma, & Jurs, 1998). Another consideration was the degree of peakedness (kurtosis) in the symmetric normal distribution of data. Most statistical tests handle violations of this assumption well but it was necessary to review these distributions prior to performing analysis (Statsoft, 2004).

CHAPTER 4

DATA ANALYSIS

This study provided an analysis of the relationship, if any, between the percentages of students receiving special education services passing the grades 3-8 and 10 reading (SEPASSR) and mathematics (SEPASSM) Texas Assessment of Academic Skills (TAAS) exams (criterion variables) and district community type (CTYPE), district enrollment (ENROLL), district socioeconomic status (ECODIS), district ethnicity (ETHNIC), district instructional expenditures per pupil (IEPS), district instructional expenditures per student receiving special education services (IEPSES), district wealth (WEALTH), district percentage of students receiving special education services (PSE), district percentage of students receiving special education services taking the grades 3-8 and 10 reading TAAS exam (PSETR), district percentage of students receiving special education services taking the grades 3-8 and 10 mathematics TAAS exam (PSETM), and the district special education data analysis system rating (DAS). The statistical technique chosen was hierarchical linear regression.

Descriptive Statistics

Descriptive statistics, in Table 1, and histograms revealed data distributions for enrollment and wealth that were excessively skewed to the left. Both had extremely high kurtosis values. A logarithmic transformation was performed on both variables to normalize the distributions and decrease kurtosis. Enrollment skewness dropped from 9.268 to .449 and the kurtosis was reduced from 125.549 to .124. Wealth skewness was reduced from 5.034 to .818 with a kurtosis drop from 33.512 to 1.401. In the discussion, ENROLL values referred to the NEWENROLLLN values that resulted from

the transformation using the natural logarithmic function. WEALTH values to be used were those that resulted from another logarithmic transformation and were identified as NEWWEALTHLN in the data set. None of the other predictor variables had distributions so excessively skewed as to severely impact the statistical analysis.

Table 1

Descriptive Statistics for Regression Analysis #1 and Analysis #2

Variable	Mean	Std Dev	Skewness	Kurtosis
SEPASSR	80.7	18.2	-2.466	8.279
SEPASSM	83.3	17.4	-2.835	10.905
CTYPE	2.74	2.03	.914	-.496
ENROLL	3959	11905	9.268	125.549
NEWENROLLLN	6.95	1.51	.449	.124
ECODIS	48.3	19.6	.169	-.112
ETHNIC	38.5	26.9	.678	-.533
IEPS	3965.70	1008.28	2.991	16.255
IEPSES	3347.15	1385.88	1.925	11.263
WEALTH	277028.40	362516.43	5.034	33.512
NEWWEALTHLN	12.17	.757	.818	1.401
PSE	14.0	4.17	1.165	4.728
PSETR	29.0	15.6	1.333	4.314
PSETM	32.3	16.5	1.005	2.877
DAS	1.71	1.52	1.877	2.53

The statistics in Table 1 revealed that, for the data analyzed, the mean community type was non-metro and growing. School districts in Texas had an average enrollment of about 4000 students coupled with a large standard deviation of 11,904. This was another indication of the skewed nature of enrollment data and the need to normalize the distribution prior to regression analysis. Statewide, 48% of students were economically disadvantaged and 38% were members of a minority group. Average instructional expenditures per student amounted to about $4,000. An extra $3,300 was spent for the instructional expenditures of each student receiving special education services. The mean per pupil taxable value or wealth per district was $277,028. This variable required a transformation to normalize the distribution. The standard deviation for district wealth was also very large with a value of $362,516 which indicated an extremely unequal distribution of fiscal resources across districts.

Targeted special education data suggested that, for the average (mean) school district in Texas, roughly 14% of the student population were in special education programs. The Special Education Data Analysis System District Rating (DAS) mean of 1.71 indicated that few districts in the state were out of statistical compliance in regards to special education populations and provided services. Of the 14% students receiving special education services population, nearly 29% (4.1% of the total student population) took the regular reading TAAS exam. Of these students, 71% or 9.9% of the total student population, did not participate in the regular reading TAAS testing. Approximately 32% of the students receiving special education services population (4.5% of the total student population) participated in the regular mathematics TAAS exam, while 68% of this student population (9.5% of the total student population) were

not involved in the regular mathematics TAAS testing. Of students receiving special education services, 81% taking the regular reading TAAS and 83% of these students who took the regular mathematics TAAS exam earned passing scores.

These descriptive statistics provided additional information when examined in conjunction with the AEIS 2001-2002 State Performance Report. From this report, 96.2% of the total student population, in grades 3-8 and 10 participated in at least one of the TAAS exams (TEA, 2002b). Of this 96.2%, only 89.5% participated in the regular TAAS testing program. The remaining 6.7% took the State Developed Alternative Assessment (SDAA). Conclusions from this information were suggested with the assumption that 89.5% of the total student population participated in the regular reading and mathematics TAAS exams. This left 10.5% of the total student population that did not participate. For reading TAAS participation, 4.1 (29% of the 14% students receiving special education services population) of these 89.5% were students receiving special education services. Ninety-one point three percent (91.3%) of these students passed the exam. Of this 91.3%, 3.3 (81% of the 4.1%) of the percentage points were students receiving special education services. Of the 8.7% who did not master the exam, 0.76 (19% of the 4.1%) of the percentage points were students receiving special education services. For mathematics TAAS participation, 4.5 (32% of the 14%) of the 89.5 percentage points were students receiving special education services. The mathematics TAAS exam produced a passing rate of 92.7%. Of this 92.7%, 3.7 (83% of the 4.5%) of the percentage points were students receiving special education services. Of the 7.3% who failed the mathematics TAAS, 0.8 (17% of the 4.5%) of the percentage points could be attributed to students receiving special education services. Subsequent to the

descriptive analysis, hierarchical linear regression of the data was performed first on reading TAAS scores and then on the mathematics TAAS scores.

Reading Analysis

The first hierarchal regression analysis answered research question one. Specifically, was there a relationship between the district percentage of grades 3-8 and 10 students who receive special education services who pass the regular reading TAAS exam (SEPASSR) and the independent variables of district community type (CTYPE), district enrollment (ENROLL), district socioeconomic status (ECODIS), district ethnicity (ETHNIC), district instructional expenditures per student (IEPS), district instructional expenditures per student receiving special education services (IEPSES), district wealth (WEALTH), district percentage of students receiving special education services (PSE), district percentage of grades 3-8 and 10 students receiving special education services taking the exam (PSETR), and district special education analysis system rating (DAS)?

The first block of variables analyzed yielded an R^2 of .138, an F (4,895) = 35.808, p<.001. The results were statistically significant indicating that 13.8% of the variance in the criterion-dependent variable percentage of students receiving special education services passing the regular reading TAAS exam could be explained by the predictor-independent variables community type, enrollment, socioeconomic status, and ethnicity.

Table 2

Multiple Regression Analysis for Statistical Analysis #1 Block 1

Multiple Regression Analysis	Value
Multiple *R*	.372
R Squared	.138
Adjusted *R* Squared	.135
Standard Error	16.36

Table 3

Analysis of Variance for Statistical Analysis #1 Block 1

	df	Sum of Squares	Mean Square
Regression	4	38360.224	9590.056
Residual	891	238628.583	267.821
F = 35.808	Significance *F* = .000		*p* < .001

Beta weights, from Table 4, indicated that all of the first block variables contributed and were as follows: community type = -.259, enrollment = .436, socioeconomic status = -.167, and ethnicity = -.186. Block one structure coefficients indicated that community type explained approximately 57.2% of the variance in percentage of special education students passing the regular reading TAAS exam, enrollment 20.1%, socioeconomic status 57.9%, and ethnicity 35.6%. These squared structure coefficients explained individually, without taking into consideration any overlap, the percentage of variance accounted for by each of the predictors. As a result,

for this initial step, and all subsequent steps for both the reading and mathematics analyses, the sum of the individually explained variance was greater than 100%.

Table 4

Coefficients for Statistical Analysis #1 Block 1

Variable	*B*	Std. Error	Beta	*T*	*Sig T*	*Structure* r^2
CTYPE	-2.219	.485	-.259	-4.575	.000	57.2
ENROLL	5.415	.720	.436	7.521	.000	20.1
ECODIS	-.152	.049	-.167	-3.096	.002	57.9
ETHNIC	-.121	.037	-.186	-3.309	.001	35.6
Constant	60.501	4.444		13.615	.000	

The second block was then entered in the regression yielding an R^2 of .177, an F (7,895) = 27.194, p<001. These results were statistically significant indicating that, with the addition of instructional expenditures per student, instructional expenditures per student receiving special education services, and district wealth in the second block of variables, approximately 17.7 % of the variance in the percentage of students receiving special education services who passed the regular reading TAAS exam was attributed to the independent or predictor variables. The R^2 increase of .038 or 3.8% indicated that the additional variables instructional expenditures per student, instructional expenditures per student receiving special education services, and wealth contributed to the variance in the criterion variable percentage of special education students who passed the regular reading TAAS exam.

Table 5

Multiple Regression Analysis for Statistical Analysis #1 Block 2

Multiple Regression Analysis	Value
Multiple *R*	.420
R Squared	.177
Adjusted *R* Squared	.170
Standard Error	16.02688
R Square Change	.038

Table 6

Analysis of Variance for Statistical Analysis #1 Block 2

	df	Sum of Squares	Mean Square
Regression	7	48896.228	6985.175
Residual	888	228092.579	256.861
F = 27.194	Significance *F* = .000	*p* < .001	

Beta weights indicated that all variables at this stage of the analysis contributed and were as follows: community type = -.239, enrollment = .387, socioeconomic status = -.201, ethnicity = -.131, instructional expenditures per student = -.067, instructional expenditures per student receiving special education services = -.176, and wealth = .021. An analysis of block two structure coefficients indicated that community type explained approximately 4.5% of the variance in percentage of students receiving special education services passing the regular reading TAAS exam, enrollment 15.8%,

socioeconomic status 45.4%, ethnicity 27.9%, instructional expenditures per student 24.3%, instructional expenditures per student receiving special education services 19.2%, and wealth 0.6%. In comparison to Table 4, and with each subsequent block entered, the added variables explained a significant amount of the increased variance.

Table 7

Coefficients for Statistical Analysis #1 Block 2

Variable	*B*	Std. Error	Beta	*T*	*Sig T*	*Structure* r^2
CTYPE	-2.046	.476	-.239	-4.297	.000	4.5
ENROLL	4.803	.793	.387	6.606	.000	15.8
ECODIS	-.183	.052	-.201	-3.507	.000	45.4
ETHNIC	-.086	.038	-.131	-2.264	.024	27.9
IEPS	-.001	.001	-.067	-1.550	.121	24.3
IEPSES	-.003	.000	-.176	-5.390	.000	19.2
WEALTH	.539	.951	.021	.567	.571	0.6
Constant	71.577	12.526		5.714	.000	

Values generated for Table 7, at this stage of the analysis, revealed that for wealth and instructional expenditures per student *t* was out of the range of statistical significance. For this study, these variables and any subsequent variables falling out of significance were retained. Under or overestimating the actual effects that were embedded within data was a relatively easy mistake to make (Thompson, 1992). Interpretation of any analytic method depended up the realization that these variables interacted in many complex and counterintuitive ways. It was suggested that a predictor

might even have a β weight of zero, but could actually be an exceptionally powerful predictor variable (Thompson & Borello, 1985). This reinforced the position that both β and structure coefficients should be examined when evaluating the importance of a predictor. It was critical to analyze this data and credit the complex nature of what was studied. Succinctly, squared structure coefficients are what they are regardless of statistical significance. They disclosed the proportion of the criterion variable (only the explained portion) variance explained by the predictors (Thompson, 1994). These nonzero coefficients, coupled with nonzero Beta weights, continued to indicate an overlapping of the predictor's contribution to the variance. This provided justification for retaining these variables as additional blocks were entered.

The third block reading analysis was then performed adding percentage of students receiving special educaion services, percentage of students receiving special education services taking the regular reading TAAS exam, and Special Education Data Analysis System District Rating. This resulted in an R^2 of .243, an F (10,895) = 28.442, p<.001. The results were statistically significant explaining approximately 24.3% of the variance in the percentage of students receiving special education services passing the regular reading TAAS exam. The R^2 increase of approximately .067 or 6.7% indicated that the third block variables continued to make a contribution to the variance in the criterion variable.

Table 8

Multiple Regression Analysis for Statistical Analysis #1 Block 3

Multiple Regression Analysis	Value
Multiple *R*	.493
R Squared	.243
Adjusted *R* Squared	.235
Standard Error	15.39026
R Square Change	.067

Table 9

Analysis of Variance for Statistical Analysis #1 Block 3

	df	Sum of Squares	Mean Square
Regression	10	67367.694	6736.769
Residual	885	209621.114	236.860
F = 28.442	Significance *F* = .000	*p* < .001	

Beta weights, or multipliers for each predictor, were as follows: community type = -.246, enrollment = .414, socioeconomic status = -.160, ethnicity = -.051, instructional expenditures per student = -.118, instructional expenditures per student receiving special education services = -.131, wealth = .015, percentage of students receiving special education services = .182, percentage of grades 3-8 and 10 students receiving special education services taking the regular reading TAAS exam = .224, and district special education data analysis system rating = -.083. Recalculated structure

coefficients, indicating the extent to which each of the predictor variables individually contributed, were as follows: community type = 3.3%, enrollment = 11.5%, socioeconomic status = 33%, ethnicity = 20.3%, instructional expenditures per student = 17.6%, instructional expenditures per student receiving special education services = 11.5%, wealth = 0.5%, percentage of students receiving special education services = 3.7%, percentage of students receiving special education services taking the regular reading TAAS exam = 33%, and district special education data analysis system rating = 5%.

Table 10

Coefficients for Statistical Analysis #1 Block 3

Variable	*B*	Std. Error	Beta	*T*	*Sig T*	*Structure* r^2
CTYPE	-2.110	.457	-.246	-4.613	.000	3.3
ENROLL	5.140	.767	.414	6.703	.000	11.5
ECODIS	-.145	.052	-.160	-2.783	.006	33.0
ETHNIC	-.033	.038	-.051	-.886	.376	20.3
IEPS	-.003	.001	-.118	-2.799	.005	17.6
IEPSES	-.002	.000	-.131	-4.066	.000	11.5
WEALTH	.394	.921	.015	.428	.669	0.5
PSE	.805	.151	.182	5.342	.000	3.7
PSETR	.301	.359	.224	6.893	.000	33.0
DAS	-.970	.359	-.083	-2.703	.007	5.0
Constant	51.082	12.398		4.120	.000	

For the TAAS reading analysis, from Table 8, 24.3% of the variance in students receiving special education services' passing rates was attributed to the predictor variables. The resulting variance in students receiving special education services passing rates was attributed to the predictor variables and was statistically significant. Table 11 presented Pearson correlation coefficients (*r*) with associated Beta weights (β) and squared structure coefficients (*structure* r^2). From this information, with nonzero Beta weights and weak but measurable correlation coefficients, it could be suggested that the predominant contributors to this total variance were socioeconomic status (*r* = -.273, β = -.160, *structure* r^2 = 33) and percentage of students receiving special education services tested (*r* = .283, β = .224, *structure* r^2 = 33). Ethnicity was the next greatest contributor to the variance in these passing rates (*r* = -.221, β = -.051, *structure* r^2 = 20.3). Community type (*r* = .100, β = -.246, *structure* r^2 = 3.3) and a district's special education data analysis system ranking (*r* = -.100, β = -.083, *structure* r^2 = 5.0) provided significant but lesser impact.

Table 11

Pearson Correlation Data, Beta Weights, and Squared Structure Coefficients for Statistical Analysis #1

	Pearson *r* SEPASSR	Beta Weight	Squared Structure Coefficients
CTYPE	.100	-.246	3.3
ENROLL	.199	.414	11.5
ECODIS	-.273	-.160	33.0
ETHNIC	-.221	-.051	20.3
IEPS	-.223	-.118	17.6
IEPSES	-.189	-.131	11.5
WEALTH	-.001	.015	0.5
PSE	.134	.182	3.7
PSETR	.283	.224	33.0
DAS	-.100	-.083	5.0

Mathematics Analysis

The second hierarchal regression analysis attempted to answer research question two. Specifically, was there a relationship between the district percentage of grades 3-8 and 10 student receiving special education services who passed the regular mathematics TAAS exam (SEPASSM) and the independent variables district community type (CTYPE), district enrollment (ENROLL), district socioeconomic status (EDODIS), district ethnicity (ETHNIC), district instructional expenditures per student

(IEPS), district instructional expenditures per student receiving special education services (IEPSES), district wealth (WEALTH), district percentage of students receiving special education services (PSE), district percentage of grades 3-8 and 10 students receiving special education services taking the exam (PSETM), and district special education analysis system rating (DAS)?

The initial block of independent variables was analyzed yielding an R^2 of .106, an F (4,913)=26.832, p<.001. These results were statistically significant and indicated that 10.6% of the variance in the percentage of students receiving special education services who passed the regular mathematics TAAS exam was explained by the predictor variables.

Table12

Multiple Regression Analysis for Statistical Analysis #2 Block 1

Multiple Regression Analysis	Value
Multiple *R*	.325
R Squared	.106
Adjusted *R* Squared	.102
Standard Error	15.85.617

Table 13

Analysis of Variance for Statistical Analysis #2 Block 1

	df	Sum of Squares	Mean Square
Regression	4	26984.213	6746.053
Residual	909	228539.039	251.418
$F = 26.832$	Significance $F = .000$		$p < .001$

As indicated by the Beta weights from Table 14, all of the predictors contributed with Beta weights as follows: community type = -.291, enrollment = .452, socioeconomic status = -.122, and ethnicity = -.163. Calculated structure coefficients (*structure* r^2) indicated that community type accounted for 4.3% of the explained variance in the percentage of students receiving special education services who passed the regular mathematics TAAS exam, enrollment 24.2%, socioeconomic status 43.4%, and ethnicity 24.9%.

Table 14

Coefficients for Statistical Analysis #2 Block 1

Variable	*B*	Std. Error	Beta	*T*	Sig *T*	Structure r^2
CTYPE	-2.373	.468	-.291	-5.072	.000	4.3
ENROLL	5.284	.689	.452	7.667	.000	24.2
ECODIS	-.105	.047	-.122	-2.253	.024	43.4
ETHNIC	-.102	.035	-.163	-2.880	.004	24.9
Constant	61.671	4.239		14.550	.000	

With the addition of instructional expenditures per student, instructional expenditures per student receiving special education service, and district wealth the second block analysis was conducted. This analysis yielded an R^2 of .130, and F (7, 913) = 20.337, p<.001. These results were statistically significant and suggested that this block of predictors impacted 13% of the variance in the percentage of students receiving special education services who passed the regular mathematics TAAS exam. The R^2 increase of approximately 3% indicated that the added variables made a weak but statistically significant contribution to the increased variance in the percentage of students receiving special education services passing the regular mathematics TAAS exam.

Table 15

Multiple Regression Analysis for Statistical Analysis #2 Block 2

Multiple Regression Analysis	Value
Multiple *R*	.368
R Squared	.136
Adjusted *R* Squared	.129
Standard Error	15.61206
R Square Change	.030

Table 16

Analysis of Variance for Statistical Analysis #2 Block 2

	df	Sum of Squares	Mean Square
Regression	7	34698.022	4956.860
Residual	906	220825.230	243.736
F = 20.337	Significance *F* = ,000		*p* < .001

Beta weights for this iteration of the analysis were as follows: community type = -.271, enrollment = .369, socioeconomic status = -.182, ethnicity = -.094, instructional expenditures per student = -.093, instructional expenditures per student receiving special education services = -.125, and wealth = -.021. Structure coefficients (*structure* r^2) for the second block analysis suggested that community type accounted for 3.3% of the criterion's explained variance, enrollment 18.9%, socioeconomic status 33.8%, ethnicity 19.4%, instructional expenditures per student 35.7%, instructional expenditures per student receiving special education services 18.2%, and wealth 0.5%.

Table 17

Coefficients for Statistical Analysis #2 Block 2

Variable	*B*	Std. Error	Beta	*T*	*Sig T*	*Structure* r^2
CTYPE	-2.212	.462	-.271	-4.793	.000	3.3
ENROLL	4.311	.762	.369	5.658	.000	18.9
ECODIS	-.157	.050	-.182	-3.154	.002	33.8
ETHNIC	-.058	.036	-.094	-1.607	.108	19.4
IEPS	-.002	.001	-.093	-2.109	.035	35.7
IEPSES	-.002	.000	-.125	-3.708	.000	18.2
WEALTH	-.497	.904	-.021	-.550	.583	0.5
Constant	87.881	12.090		7.269	.000	

Final block analysis yielded a statistically significant R^2 of .199, and F (10, 913) = 22.460, p<.0001. Approximately 19.9% of the variance in the percentage of students receiving special education services who passed the regular mathematics TAAS exam was explained by the predictor variables. R-squared continued to increase (.063 or 6.3%) which indicated that a statistically significant contribution was made when percentage of students receiving special education services, percentage of student receiving special education services taking the regular mathematics TAAS exam, and district special education data analysis system rating were added.

Table 18

Multiple Regression Analysis for Statistical Analysis #2 Block 3

Multiple Regression Analysis	Value
Multiple *R*	.446
R Squared	.199
Adjusted *R* Squared	.190
Standard Error	15.05350
R Square Change	.063

Table 19

Analysis of Variance for Statistical Analysis #2 Block 3

	df	Sum of Squares	Mean Square
Regression	10	50896.417	5089.642
Residual	903	204626.836	226.608
F = 22.460	Significance *F* = ,000		*p* < .001

All predictor variables continued to contribute to the criterion variance as indicated by the Beta weights which were as follows: community type = -.280, enrollment = .409, socioeconomic status = -.144, ethnicity = -.030, instructional expenditures per student = -.146, instructional expenditures per student receiving special education services = -.085, wealth = -.025, percentage of student receiving special education services = .172, percentage of students receiving special education services taking the regular mathematics TAAS exam = .202, and district special education data analysis system rating = -.109. The final structure coefficients were:

community type = 2.3%, enrollment = 12.9%, socioeconomic status = 23%, ethnicity = 13.2%, instructional expenditures per student = 24.3%, instructional expenditures per student receiving special education services = 12.4%, wealth = 0.34%, percentage of students receiving special education services = 3.8%, percentage of students receiving special education services taking the regular mathematics TAAS exam = 22.6% and district special education data analysis system rating = 7.4%.

Table 20

Coefficients for Statistical Analysis #2 Block 3

Variable	*B*	Std. Error	Beta	*T*	*Sig T*	*Structure* r^2
CTYPE	-2.289	.445	-.280	-5.140	.000	2.3
ENROLL	4.779	.740	.409	6.457	.000	12.9
ECODIS	-.124	.050	-.144	-2.494	.013	33
ETHNIC	-.019	.036	-.030	-.512	.609	13.2
IEPS	-.003	.001	-.146	-3.324	.001	24.3
IEPSES	-.001	.000	-.085	-2.541	.011	12.4
WEALTH	-.608	.879	-.025	-.691	.490	0.34
PSE	.737	.148	.172	4.980	.000	3.8
PSETM	.240	.039	.202	6.202	.000	22.6
DAS	-1.215	.349	-.109	-3.484	.001	7.4
Constant	69.332	12.028		5.764	.000	

For the TAAS mathematics analysis, Pearson correlation coefficients (*r*) were also calculated and presented in Table 21 with each variable's associated Beta weights

(β) and squared structure coefficients (*structure* r^2). An examination of this data indicated that socioeconomic status was the dominant contributor to the variance in students receiving special education services passing rates (r = -.207, β = -.144, *structure* r^2 = 33). Instructional expenditures per student (r = -.237, β = -.146, *structure* r^2 = 24.3) was the second strongest predictor followed closely by the percentage of students receiving special education services who took the regular mathematics TAAS exam (r = .219, β = .202, *structure* r^2 = 22.6).

Table 21

Pearson Correlation Data, Beta Weights, and Squared Structure Coefficients for Statistical Analysis #2

	Pearson *r* SEPASSR	Beta Weight	Squared Structure Coefficients
CTYPE	.079	-.280	2.3
ENROLL	.193	.409	12.9
ECODIS	-.207	-.144	33.0
ETHNIC	-.164	-.030	13.2
IEPS	-.237	-.146	24.3
IEPSES	-.164	-.085	12.4
WEALTH	-.060	-.025	0.34
PSE	.130	.172	3.8
PSETM	.219	.202	22.6
DAS	-.109	-.109	7.4

Findings for the mathematics analysis (Table 21) were similar to those for the reading (Table 11) in regards to the percentage of student receiving special education services who took the exam (r = .219, β = .202, *structure* r^2 = 22.6) although instructional expenditures per student (r = -.237, β = -.146, *structure* r^2 = 24.3) was actually the second strongest predictor. As with the reading analysis, the percentage of students receiving special education services (r = .130, β = .172, *structure* r^2 = 3.8), community type (r = .079, β = -.280, *structured* r^2 = 2.3), and the special education data analysis system ranking (r = -.109, β = -.109, *structured* r^2 = 7.4) had lower impact.

Table 22

Pearson Correlation Data for Predictor Variables

	CTYPE	ENROLL	ECODIS	ETHNIC	IEPS	IEPSES	WEALTH	PSE	PSETR	PSETM	DAS
CTYPE	1	.833	-.164	.202	-.396	.044	-.079	-.250	.074	.061	.133
ENROLL	.833	1	-.069	.313	-.535	.012	-.185	-.260	.015	.000	.189
ECODIS	-.164	-.069	1	.727	.032	.012	-.288	.053	-.327	-.290	.181
ETHNIC	.202	.313	.727	1	-.068	.064	-.158	-.208	-.231	-.190	.248
IEPS	-.396	-.535	-.032	-.068	1	.276	.499	.109	.073	.113	-.083
IEPSES	.044	.012	.012	.064	.276	1	.156	-.252	.061	.085	.075
WEALTH	.079	-.185	-.288	-.158	.499	.156	1	-.108	.200	.206	-.062
PSE	-.250	-.260	.503	-.208	-.109	-.252	-.108	1	-.148	-.157	-.123
PSETR	.074	.015	-.327	-.231	.073	.061	.200	-.148	1	.909	-.102
PSETM	.061	.061	-.290	-.190	.113	.085	.206	-.157	.909	1	-.106
DAS	.133	.133	.181	.248	-.083	.075	-.062	-.123	-.102	-.106	1

Summary

The purpose of this study was to determine what factors were related to students with disabilities doing well when included in high stakes standardized testing. The results of these analyses produced significant findings. Socioeconomic status was clearly the dominant predictor of success. District wealth was the weakest predictor. At odds with much of the existing research, the percentage of students in special education programs was also one of the lesser predictors. The caveat was that the percentage of students receiving special education services tested was an extremely strong and positive predictor. These results will be discussed in Chapter 5.

CHAPTER 5

SUMMARY

The objective of this study is to identify what factors influenced the academic outcomes of students receiving special education services in Texas public schools in relation to high stakes standardized testing. These outcomes are measured by an examination of scores on the 2001-2002 grades 3-8 and 10 reading and mathematics TAAS exams. This study's literature research and statistical analysis specifically targeted these factors. Similar studies in this area generally produced mixed results. This study observed a similar trend. The output data, displayed in Table 23 for both the reading and mathematics analysis, is also extremely similar to other studies.

Discussion

The first regression analysis specifically targets TAAS reading scores. From this initial analysis, 24.3% (R^2 = 24.3) of the variance in students receiving special education services passing rates is attributed to the independent variables tested; community type, enrollment, socioeconomic status, ethnicity, instructional expenditures per pupil, instructional expenditures per student receiving special education services, wealth, percentage of students receiving special education services, percentage of students receiving special education services taking the exam, and special education data analysis system rating. The second regression analysis targets TAAS mathematics scores. These same independent variables account for 19.9% (R^2 = 19.9) of the variance in the passing rates of students receiving special education services.

Table 23

Correlational Data and Coefficients for Reading and Mathematics Analyses

Variable	Pearson *r* SEPASSR	*Pearson r* SEPASSM	Beta Weight SEPASSR	Beta Weight SEPASSM	Squared Structure Coefficients SEPASSR (R^2 = 24.3)	Squared Structure Coefficients SEPASSM (R^2 = 19.9)
CTYPE	.100	.079	-.246	-.280	3.3	2.3
ENROLL	.199	.193	.414	.409	11.5	12.9
ECODIS	-.273	-.207	-.160	-.144	33.0	33.0
ETHNIC	-.221	-.164	-.051	-.030	20.3	13.2
IEPS	-.223	-.237	-.118	-.146	17.6	24.3
IEPSES	-.189	-.164	-.131	-.085	11.5	12.4
WEALTH	-.001	-.060	.015	-.025	0.5	0.34
PSE	.134	.130	.182	.172	3.7	3.8
PSETR	.283		.224		33.0	
PSETM		.219		.202		22.6
DAS	-.100	-.109	-.083	-.109	5.0	7.4

An examination of correlation coefficients, beta weights, and squared structure coefficients for both reading and mathematics clearly indicate that district wealth has the least impact on passing rates. Wealth is not only weaker in its effect but statistically insignificant when initially introduced into the analysis. Wealth remains insignificant

throughout the regression when the final block of variables; percentage of students receiving special education services, percentage of students receiving special education services taking the exam, and special education data analysis system rating are added. Wealth also correlates weakly and negatively with special education passing rates. Beta weights are small and, in the analysis of mathematics, negative.

Webb's 2000 study produced similar results in regards to wealth and indicated a very weak relationship between district wealth and test scores. The 2000 Shive study also supported this position regarding district wealth. The analysis in this study never showed any statistical significance between achievement test scores and per pupil revenue from local sources. These results were contrasted by those of other researchers. Hedges, Laine, and Greenwald (1994) conducted the meta-analysis that showed a positive relation between resources and educational outcomes. The Smith (1999) study specifically targeted district wealth. This study concluded that the greater the wealth of a district the higher the SAT scores. From these results, it can be suggested that Texas may have neutralized the impact of wealth on public education testing outcomes with its current funding formula in regard to funding education for students with disabilities.

Closely related to the investigation of wealth is the statistical importance of expenditures. In this study, instructional expenditures per student and instructional expenditures per student receiving special education services are statistically significant for both the reading and mathematics analyses. For reading scores, these two variables individually account for 17.6% and 11.5% of the total variance. The results for mathematics are similar with instructional expenditures per student and instructional

expenditures per student receiving special education services individually responsible for 24.3% and 12.4% of the total variance in exam scores. Although statistically significant, the resulting correlation coefficients and beta weights are negative. This indicates an inverse relationship between instructional expenditures and student receiving special education services achievement.

Two other studies produced these negative coefficients. The Webb (2000) study generated a weak but negative relationship between per pupil expenditures and passing rates on a high school graduation test. Cameron's (2000) research also produced statistically significant but weak and inconclusive results between instructional per pupil expenditures and TAAS scores. Associated with these results were, again, the negative beta weights and correlation coefficients. This discussion indicated that instructional expenditures negatively impacted test scores. Hanashek (1989) conducted a meta-analysis that indicated no significant relationship between expenditures and student achievement. Coate and Vanderhoff (1999) produced similar results that indicated no relationship between expenditures and student achievement on targeted proficiency exams and SAT scores. These results added to the debate as other researchers suggested the converse. Direct instructional expenditures had positively impacted student achievement according to the 1986 meta-analysis of Childs and Shakeshaft's. The 1994 meta-analysis of Hedges, Laine, and Greenwald also suggested that a positive relationship between resources and educational outcomes existed and was significant. Clark's (2002) research also suggested that providing more resources for instruction produced higher actual test scores. The fact that instructional expenditures in Texas are statistically significant, individually account for a rather large percentage of

the variance in passing scores, and are inversely correlated might raise a question concerning how the additional money is being used on the student actually taking the exam. It could also reflect that expenditures for the students taking the exam could not be separated from expenditures for all students with disabilities.

An investigation of the impact of community type produces mixed results. While statistically significant, this variable accounts individually for only 3.3% and 2.3% of the variance in reading and mathematics test scores respectively. For both the reading and mathematics analysis, the beta weight is negative (-.246 and -.280), and there is little direct correlation with passing percentages (.100 and .079). Enrollment, highly correlates with community type (.833) and impacts the analysis in a much different manner. This predictor variable individually accounts for 11.5% of the variance in reading scores and 12.9% of the variance in mathematics scores.

The Chavez (2002) study supported these findings. This study investigated school size and its relationship to student achievement in grades 9-12. TAAS exams were one of the measures of student achievement incorporated into the study. Students receiving special education services were not broken out of this study, but the results indicated that, in the state of Texas, students had significantly better scores on standardized exams in large schools. Stewart (2002) conducted a similar study investigating tenth grade TAAS scores in relation to school size with the opposite results. University Interscholastic League classifications ranging from 1A (the smallest classification) to 5A (the largest classification were used as a measure of school size. In this study, 1A and 2A schools experienced higher levels of achievement on the tenth grade TAAS exam.

This study also clearly supports research such as Coleman (1966) as well as more current studies (Shive, 2000; Webb, 2000) that socioeconomic status affects student achievement both statistically and negatively (reading: $\beta = -.160$, $r = -.273$; mathematics: $\beta = -.144$, $r = -.207$). For both the reading and mathematics analysis this variable individually impacts 33% of the total variance in the percentage of students receiving special education services passing the TAAS.

Ethnicity remains statistically significant during the reading analysis until the percentage of students in special education, the percentage of students receiving special education services tested, and special education data analysis system rating are added to the regression. Mathematics analysis produces a statistically significant impact by ethnicity only during the initial block analysis when examined in conjunction with community type, enrollment, and socioeconomic status. Final analysis results in a statistically insignificant finding regarding the impact ethnicity has on TAAS passing rates. Beta weights are also low and negative (reading = -.051, mathematics = -.030). This is contrasted, in terms of statistical significance, by Hudson (1999) who examined differences between students with disabilities who passed and failed a high school proficiency exam in Nevada. In this study, ethnicity was significantly related to examination results. Shive (2000) broke ethnicity out into African-American and Hispanic students but did not specifically target special education. The percentage of African-American students was statistically significant and a negative indicator of achievement test scores. The percentage of Hispanic students also negatively impacted test score but the results were consistently insignificant.

Findings, in regards to ethnicity, emphasize the importance of examining more than beta weights and statistical significance. Statistically, ethnicity's impact in regards to the regression is moderated with the addition of subsequent predictors. For both the reading and mathematics analyses, the correlation coefficients are negative (reading r = -.221, mathematics r = -.164). Beta weights are also negative and small (reading β = -.051, mathematics β = -.030). Although out of the range of statistical significance, it is suggested that ethnicity was a relatively large contributor, individually, to the 24.3% and 19.9% explained variance in passing rates. Ethnicity individually accounts for 20.3 % of the total variance in reading scores and 13.2% of the total variance in mathematics scores.

The results for socioeconomic status and ethnicity again illustrate the complex interaction between the selected predictor variables. There is a high direct correlation between these two variables (r = .727). This is similar to the correlation between enrollment and community type. Community type and enrollment both have relatively substantial and negative beta weights but enrollment contributes a substantially greater individual percentage to total variance. Socioeconomic status and ethnicity have weaker and negative beta coefficients but both make a substantial contribution to total variance. Socioeconomic status and ethnicity substantially and negatively impact students receiving special education services performance on the TAAS.

The variables that specifically target the student receiving special education services (special education demographics) produce interesting results. While statistically significant, a district's special education data analysis system rating (DAS) reveals a minimal impact similar to a district's wealth. DAS individually accounts for only

5.0% and 7.4% of the variance in student receiving special education services passing percentages on the reading and mathematics TAAS exams. The beta weight is negative and small (-.083) coupled with a very low direct correlation (r = -.100) with the percentage of students receiving special education services passing the regular reading TAAS exam. Mathematics analysis produces similar results (β = -.109, r =-.109). These results indicate that adhering to special education procedural guidelines, as indicated by a district's DAS rating, have the least overall impact on reading and mathematics TAAS scores of the student receiving special education services. The mean DAS rating of 1.71 (Table 1) indicates that most schools in Texas are following the procedural guidelines. Conversely, since districts are generally following the guidelines, little variance is expected.

The percentage of students receiving special education services produces statistically significant findings nearly as weak as DAS although all beta weights and correlation coefficients are positive. This percentage of students accounts individually for 3.7% and 3.8% of the total variance in passing percentages of the student receiving special education services on the reading and mathematics TAAS exams. Accompanying beta weights and correlation coefficients are also low (reading: β = .182, r = .134; mathematics β = .172, r = .130). These findings, while statistically significant, provide moderate support for the contention that standardized testing and the associated accountability ratings have resulted in the incorrect identification of students receiving special education services.

This type of weak to moderate support was evidenced by the Webb (2000) study conducted in Georgia. Special education enrollment had a weak, positive, although

statistically insignificant, impact on the Georgia High School Graduation Test. Other studies made stronger contentions. Survey research conducted by Handlogten (1999) concluded that school officials were so concerned about the reported outcomes and accountability ratings associated with the TAAS exam that students with disabilities were excluded from the testing. Deere and Strayer (2001) had also conducted studies in Texas with similar results. This study examined increased passing rates from one year to the next and made comparison with changes in student exemptions for those two years. A strong negative relationship was found between the exemption rate in one year and the TAAS scores in the previous year. Primarily, students were exempted on the basis of special education placement. Research conducted by Figlio and Getzler (2002) in Florida came to similar conclusions. In their study, data suggested that lower achieving students in tested grade levels were placed in special education at statistically significant higher rates that those in grade levels not tested.

Two reviewed studies questioned the suggestion of excessive special education identification. The Grubbs (2000) study reported that Texas schools with the highest accountability rating (exemplary) exempted students receiving special education services from testing at relatively lower rates. In converse, low-performing campuses had the highest identification and testing exemption rates. A Greene and Forster (2002) study also lent support to these findings. Regression analysis conducted in this study found that the relationship between special education enrollment and high-stakes testing was not statistically significant. Not only this, but, the regression coefficients for high-stakes testing were negative. These researchers concluded that states with high-

stakes standardized testing actually had lower rather than higher rates of special education enrollment.

While the percentage of students receiving special education services has lesser impact, the percentage of students receiving special education services who actually participate in the regular reading and mathematics TAAS testing is statistically significant, and produces a much greater impact. This percentage individually impacts reading score variance at the same level as socioeconomic status (33%). Beta weights and correlation coefficients are both positive ($\beta = .224$, $r = .283$). The percentage of students receiving special education services tested in mathematics individually impacts mathematic score variance at 22.6%. Beta weights and correlation coefficients are also positive ($\beta = .202$, $r = .219$). This indicates that it might not be an issue of whether or not a student is in special education. Rather, it might be presented that the critical issue is whether or not the student receiving special education services is included in regular standardized testing. Similar to previous studies, certain districts continue to manipulate testing results through the exclusion of students being tested.

Conclusion

This study sought to determine what factors influence the academic outcomes of student receiving special education services in relation to mandated standardized testing in Texas. It produces varied but statistically significant results in regards to student receiving special education services passing rates on the reading and mathematics TAAS exams. The only two variables statistically insignificant are district wealth and the district percentage of minority students. Of these two, wealth accounts individually for 0.50% of the total variance in reading scores and 0.34% of the variance

in mathematics scores. Ethnicity is a substantial contributor, accounting individually for 20.3% of the variance in reading and 13.2% of the mathematics variance. Closely related to the insignificance of wealth is the statistical, albeit negative, significance of instructional expenditures per student and instructional expenditures per student receiving special education services. It would have been illogical to state that the availability of resources made no difference but these results allow the question of how much. This suggests that the finance formulas and federal dollars, for both regular and special education, address differences in the availability of resources across public school districts in Texas, but the way in which resources continue to be used raises questions on the effectiveness of these expenditures.

Collectively, two variables in this study produce positive beta weights, substantial squared structure coefficients, and positive Pearson correlation coefficients. This indicates that, with the regression taking into consideration the interaction between the predictor variables, the percentage of students receiving special education services tested and enrollment make the greatest positive impact on student receiving special education services passing rates. Clearly enrollment produces the most substantial positive regression coefficients. As well, enrollment individually accounts for a noticeable percentage of the total variance in passing percentages although the direct correlation with passing percentages was rather weak. Enrollment is a significant positive factor and weakly correlated with the other substantial positive predictors; percentage of students receiving special education services tested in reading and percentage of students receiving special education services tested in mathematics.

Larger schools appear to provide a positive impact for the student receiving special education services.

Overall, with these analyses, the strongest positive predictor of student receiving special education services success on the grades 3-8 and 10 reading and mathematics TAAS exams is the percentage of these students tested. These percentages produce the largest positive correlations with passing rates (reading r = .283, mathematics r = .219) and the second largest regression coefficients (reading β = .224, mathematics β = .202). They also, for positively correlated predictors, individually account for the largest percentage of total criterion variance (reading = 33.0%, mathematics = 22.6%). For this study, these results clearly indicate that the dominant positive predictor of testing success for the student receiving special education services is the percentage of these students tested. Conversely, socioeconomic status is the dominant negative predictor.

The results of this study also provide a basis for discussion of special education accountability systems specifically at the federal level with the passage of the *No Child Left Behind Act (NCLB). NCLB* requires that, nationwide, states test the progress of every student yearly using tests aligned to standards (U.S. Department of Education, 2002). This applies to all children and includes children with disabilities. Additionally, in regards to regular standardized testing, only 1% of the scores of students receiving special education services are allowed to be exempted. The remaining percentage of students in special education programs are to take either the regular grade level TAKS exam or have alternative assessment scores counted as failures. This study, and the majority of reviewed literature in this area (Deere & Strayer, 2001; Figlio & Getzler, 2002; Fries, 1998; Handlogten, 1999; Jacob, 2002a &2002b; Lamping, 2001;

Langenfeld, Thurlowe, & Scott, 1997; Lombard & Burke, 1999; McQueen, 1999; Zlatos, 1994), is the type of research that fueled passage of *NCLB*. Not all, but the majority of studies reviewed suggest and/or imply that the excessive identification of students for special education services is detrimental. While the percentage of students receiving special education services is not a good statistical predictor of testing success, a student must first be identified for special education before exemption. In this study, the percentage of students receiving special education services tested shows to be the strongest overall predictor of special education student testing success.

Recommendations

The first recommendation for further research would be to replicate this study with the most current TAKS scores available. It could aid in policy making and add to the current literature if a comparison is made when taking into consideration the more rigorous TAKS exam as well as federal and state mandates. If replicated for several subsequent years the studies can investigate the consistency of these relationships.

To obtain finer results, another recommendation would be to examine the specific subcategories of special education expenditures (i.e. personnel, teacher salary, teacher experience, assistive technology). In this study, overall expenditures for special education instruction were inversely correlated with passing rates. This recommendation will reveal whether or not this is true for each individual area of special education instructional expenditures.

Another recommendation is to investigate exactly how districts determine the exemption of students receiving special education services from the regular testing

program. There are guidelines for making this determination, but in practice these determinations are directed by district policy and ARD recommendations.

A final recommendation would be to scrutinize the testing performance of the population of students receiving special education services whose achievement testing indicates performance levels academically below grade level but are required or designated to participate in standardized TAKS testing at their chronological grade level.

Summary

The results of this study on the impact of socioeconomic status and ethnicity on student achievement are supported by previous studies. The fact that wealth has little impact, coupled with the suggested negative impact of instructional expenditures adds to the current debate regarding the need for additional resources and/or the more equitable distribution of these resources. Findings, in regard to enrollment, heavily supports existing research indicating that larger schools produced better achieving students especially in the area concerning students with disabilities. A relatively equal number of analyses suggest the smaller school produces better testing results. Research is split on the affect of special education identification on high stakes standardized testing and the associated accountability. Research and policy, with the resulting *NCLB* Act, were not necessarily divergent in regards to the preferred inclusion of students receiving special education services in state testing and accountability initiatives. This study suggests that better identification of students needing special education services and greater inclusion of identified students is important.

The research agrees with Parrish's (2002, December) response to the Greene and Forster (2002) study. Parrish suggests that special education identification is less likely to be impacted by how high stakes the tests are, than how the student receiving special education services is counted and reported in the results. Is it equitable that a student receiving special education services is required to participate in a grade level testing program because of age versus comparison to appropriate progress according to the student's academic placement level? This research suggests that one should be careful to appropriately identify the student for special education services. Upon appropriate identification, it is then critical that this student is included in the standardized testing program. I suggest that the student not only be appropriately identified, but also appropriately tested.

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