

**TAKS SCORES OF GENERAL EDUCATION STUDENTS IN SECONDARY
CO-TEACH CLASSES IN A TEXAS SCHOOL DISTRICT**

A Record of Study

by

NANCY GUIDO NEUGEBAUER

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

May 2008

Major Subject: Educational Administration

**TAKS SCORES OF GENERAL EDUCATION STUDENTS IN SECONDARY
CO-TEACH CLASSES IN A TEXAS SCHOOL DISTRICT**

A Record of Study

by

NANCY GUIDO NEUGEBAUER

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF EDUCATION

Approved by:

Co-Chairs of Committee,	Virginia Collier John R. Hoyle
Committee Members,	Luana Zellner Alvin Larke
Head of Department,	Jim Scheurich

May 2008

Major Subject: Educational Administration

ABSTRACT

TAKS Scores of General Education Students in Secondary Co-teach Classes
in a Texas School District. (May 2008)

Nancy Guido Neugebauer, B.S., Texas A&M University;

M.Ed., Texas A&M University

Co-Chairs of Advisory Committee: Dr. Virginia Collier
Dr. John R. Hoyle

Inclusion of students at all levels is a challenge. The acceptance of this challenge, however, has been mandated by the No Child Left Behind and the Individuals with Disabilities Education Improvement Act of 2004. Co-teaching is one among the service delivery models of inclusion implemented in the general education classroom (Rea & Connell, 2005; Weiss & Lloyd, 2002). This study compared the achievement of general education students in general education classes to the achievement of general education students in co-teach classes to determine if there is a significant difference in the achievement of general education students because of participation in a co-teach classroom instructional arrangement.

The population of this quantitative study consisted of secondary general education students from a large suburban school district in Texas conducting science and social studies courses in both co-teach and non-co-teach classrooms. The t-test for the two independent samples was used to determine the statistical difference between the mean Science scores and the mean social studies scores of the treatment group and

the comparison group on the Texas Assessment of Knowledge and Skills in science and social studies. An alpha level of .05 was used as the standard of significance on all tests. Two-way ANOVA was used to determine student achievement differences in treatment and/or comparison groups by gender, ethnicity, English language learner status, and socioeconomic status. Post-hoc analysis of the impact of ethnicity was also undertaken.

Results indicate that general education students performed at higher levels in regular Science classes than in co-teach science classes. Results also concluded that general education students performed at higher levels in regular social studies classes than in co-teach social studies classes. Significant student achievement variations were also found to be correlated with each of the other variables considered. Recommendations for further research and stakeholders were provided.

ACKNOWLEDGEMENTS

This dissertation could not have been completed without the encouragement and support of many wonderful people. The members of my committee each played a significant role in my achievement and success. I have been extremely fortunate to have Dr. Virginia Collier in this journey. To work with someone as understanding, patient, supportive, and committed is something I wish for all future doctoral candidates. I would also like to express deep gratitude to Dr. John Hoyle for his guidance and support. Their unending drive and extraordinary enthusiasm and dedication for education have been of great inspiration and motivation in my work. I sincerely thank Dr. Luana Zellner and Dr. Alvin Larke for providing helpful advice and support along the way. I also want to thank Joyce, Clarice, and Bill for all of their guidance.

I could not have made it through the ups and downs of my doctoral studies without my colleagues, especially Wanda and Veronica. I will always treasure their friendship and the relationships that were created during this educational pilgrimage.

In addition to my colleagues, I would like to acknowledge my friends and family that supported me throughout this endeavor. A special thank you goes to my parents for their faith in me and for instilling the strong work ethic that I have. I also thank all of my students who touched my life and created learning experiences throughout my career.

And to my greatest supporters, my two daughters Elise and Amanda, for being both delightful distractions from this dissertation and for being my motivation for completing this task itself. My hope for you is that you find the value of hard work, persistence, and creativity and that it leads you to find your path and your passion. I love you both!

TABLE OF CONTENTS

	Page
ABSTRACT	iii
ACKNOWLEDGEMENTS.....	v
TABLE OF CONTENTS	vi
LIST OF TABLES	viii
 CHAPTER	
I INTRODUCTION.....	1
Statement of the Problem	4
Purpose of the Study	5
Research Questions	5
Operational Definitions	6
Assumptions	10
Limitations.....	10
Significance of the Study	11
Organization of the Record of Study	12
II LITERATURE REVIEW	13
No Child Left Behind.....	14
Historical Development of Individuals with Disabilities	
Education Act Requirements	18
Relationship between Inclusion and School Improvement	23
Effective Instruction and Students with Disabilities.....	26
Definition and Structure of Co-teaching	27
Overview of Co-teaching Studies.....	31
Co-teaching and Student Outcomes.....	38
Summary	44
III METHODOLOGY	46
Introduction	47
Population.....	48
Procedures	49
Research Questions	50

CHAPTER	Page
Research Design	50
Procedures and Instruments.....	51
Data Collection Tools	52
Limitations.....	53
Human Participants and Ethics Precautions.....	54
Summary	54
IV RESULTS	56
Variables within the Study	58
Independent and Dependent Variables.....	58
Research Question 1.....	60
Research Question 2.....	62
Research Question 3.....	63
Summary	85
V SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS.....	86
Summary	86
Statement of the Problem	87
Methodology.....	88
Conclusions	89
Recommendations for Future Research and Practice	98
REFERENCES	103
VITA	113

LIST OF TABLES

TABLE	Page
1. Number, Mean, and Standard Deviation for the Science Scales Scores of Students Organized by Their Co-teach Status	61
2. Independent Samples <i>t</i> -test for Science Scale Score, by Co-teach Status with Equal Variances Assumed	62
3. The Number, Mean, and Standard Deviation of the Social Studies Scales Scores of Students Organized by Their Co-teach Status of Students.....	62
4. Independent Samples <i>t</i> -test for Social Studies Scale Score, by Co-teach Status with Equal Variances Assumed	63
5. The Number, Mean, and Standard Deviation of Student Science Scale Scores Organized by the Gender of the Students.....	65
6. Two-way ANOVA Results for Science Scale Scores of Students Organized by Gender.....	65
7. Number, Mean, and Standard Deviation of Student Social Studies Scale Scores Organized by Gender and Co-teach Status.....	67
8. Two-way ANOVA Results for Social Studies Scale Scores of Students Organized by Gender.....	67
9. Number, Mean, and Standard Deviation of Student Science Scale Scores Organized by ELL and Co-teach Status	69
10. Two-way ANOVA Results for Science Scale Scores of Students Organized by ELL Status.....	70
11. Number, Mean, and Standard Deviation of Student Social Studies Scale Scores Organized by ELL Status of Students.....	71
12. Two-way ANOVA Results for Social Studies Scale Scores of Students Organized by ELL Status.....	72

TABLE	Page
13. Number, Mean, and Standard Deviation of Student Science Scale Scores Organized by the Economic Disadvantaged Status of the Students.....	74
14. Two-way ANOVA Results for Science Scale Scores of Students Organized by Economic Disadvantaged Status	74
15. Number, Mean, and Standard Deviation of Student Social Studies Scale Scores Organized by Economic Disadvantaged and Co-teach Status.....	76
16. Two-way ANOVA Results for Social Studies Scales Scores of Students Organized by Economic Disadvantaged Status	77
17. Number, Mean, and Standard Deviation of Student Science Scale Scores Organized by the Ethnicity of the Students	79
18. Two-way ANOVA Results for Science Scale Scores Organized by Ethnicity.....	80
19. Number and Mean of Student Science Scale Scores Organized by Ethnicity Groups of the Students.....	81
20. Number, Mean, and Standard Deviation of Student Social Studies Scale Scores Organized by the Ethnicity of the Students	82
21. Two-way ANOVA Results for Social Studies Scale Scores Organized by Ethnicity	83
22. Number and Mean of Student Social Studies Scale Scores Organized by Ethnicity Groups of the Students.....	84

CHAPTER I

INTRODUCTION

With the reauthorization of the Elementary and Secondary Education Act (ESEA), known as *No Child Left Behind, 2001* (NCLB), Public Law 107-110, Congress focused on improving students' achievement through accountability standards. Key principles underlying NCLB reinforced ideas that *all* children have a right to a quality education, required states to demonstrate progress from year to year in raising the percentage of *all* students who are proficient in reading and mathematics, and required that every classroom is staffed with a highly qualified teacher by the 2005-2006 school year. Educators considered NCLB landmark legislation because it was the first time general education policy included the academic outcomes for children with disabilities (Foley & Reder, 2002).

Shortly after President George W. Bush signed NCLB, special education advocacy groups began making recommendations for the reauthorization of the civil rights law called the Individuals with Disabilities Education Act (IDEA). The Individuals with Disabilities Education Act entitles students with disabilities to a free and appropriate public education in the least restrictive environment (LRE). The law presumes

The style and format for this record of study follow that of the *Journal of Educational Research*.

that students with disabilities will be educated in regular classrooms unless their academic and/or social needs could not be adequately met there. Thus, more and more students with disabilities are being included in the general classroom, alongside their peers without disabilities.

The growing number of students with disabilities included in the general classroom has presented an instructional challenge for general educators who are now faced with a classroom of students with diverse academic skills and learning styles. In order to meet student needs, general educators are working collaboratively with special educators and resource personnel to share strategies and practices that enhance student outcomes for *all* students in the inclusive classroom.

The evolution toward inclusion has created an emphasis on educating students with disabilities in general classrooms (Salend & Duhaney, 1999). Inclusive schools seek to establish communities of learners by educating *all* students together in age-appropriate, general classrooms in their neighborhood schools. Although the inclusion movement has focused on students with disabilities, it is designed to alter philosophy for educating *all* students (Ferguson, 1996).

Following the least restrictive environment provisions, students with disabilities receive educational services along a continuum ranging from a least to most restrictive learning environment. Co-teaching is among the service delivery models typically implemented in the general classroom (Rea & Connell, 2005; Weiss & Lloyd, 2002). Co-teach service delivery entails special education and general education teachers working together planning lessons, instructing students, and assessing performance (Bauwens, Hourcade, & Friend, 1989). At the secondary level, both general education

teachers and special education co-teachers in co-teach classes assume dynamic roles in instruction, student support, and as partners in collaboration (Keefe & Moore, 2004; Weis & Lloyd, 2002).

Educational professionals use the term co-teaching interchangeably with collaborative teaching and team teaching. Researchers have identified a variety of definitions to describe models of co-teaching in their studies (Bauwens & Hourcade, 1991; Friend & Reising, 1993; Vaughn, Bos, & Shumm, 2003; Welch, 2000). The work of Bauwens et al. (1989) introduced the term *cooperative teaching* or *co-teaching* as an outgrowth of the collaborative consultation model:

Cooperative teaching (or co-teaching) refers to an educational approach in which general and special educators work in an interactive and coordinated fashion to jointly teach heterogeneous groups of students in educationally integrated settings (i.e., general classrooms). In cooperative teaching, both general and special educators are simultaneously present in the general classroom, maintaining joint responsibilities for specified education instruction that is to occur within that setting. (p. 18)

Common themes, such as special and general educators working together, shared teaching responsibility, and diverse student groups, continued to be prominent in operational definitions in co-teaching literature. Friend and Cook (1992) illustrated transformations in co-teaching terminology. They described co-teaching as an instructional delivery approach in which “two teachers plan lessons and deliver instruction together and share the responsibility of assessing students’ mastery” (p. 30). Researchers referred to and modified the seminal definitions presented by Bauwens et al. (1989) as well as Friend and Cook (1992) when examining collaborative service delivery models.

Statement of the Problem

Inclusion of students at all levels is a challenge, one that has been intensified by the mandates of No Child Left Behind, and the Individuals with Disabilities Education Improvement Act of 2004 (IDEIA 2004), the most recent reauthorization to IDEA. More specifically, NCLB states that students with disabilities will be counted in calculations of required adequate yearly progress (AYP), and thus must be proficient in curriculum content. Federal legislation shifted the focus from where students with disabilities are educated to how well they are educated, raising a new issue in regard to academic achievement.

Co-teaching is among the service delivery models implemented in the general education classroom (Rea & Connell, 2005; Weiss & Lloyd, 2002). General education and special education teachers are charged with structuring the co-teach classroom around task-oriented goals that emphasize learning mastery. They must provide positive reinforcement to *all* students for setting and achieving personal learning goals, with an emphasis on academic outcomes for *all* students, with and without disabilities. There must be positive outcomes for students with disabilities as well as general education students in co-teach classes.

There is a large body of research on co-teaching, but there is a gap in the literature that includes the impact of co-teach classes on the academic achievement of secondary general education students in those classes. Consequently, there also exists a gap in the research literature speaking to the impact of the co-teach class on student achievement in relationship to gender, ethnicity, English language learner status, and socioeconomic status of general education students in co-teach classes compared to

similar general education students in general education classes. This research is designed to address these gaps in the literature.

Purpose of the Study

The purpose of this study was to compare the achievement of general education students in regular education classes to the achievement of general education students in co-teach classes to determine if there was a significant difference in the achievement of general education students because of participation in a co-teach classroom instructional arrangement. The study examined the achievement of general education students in general education classrooms to the achievement of regular education students in co-teach classrooms in two content areas, science and social studies. In addition, the achievement of general education students in both regular education classes and co-teach classes were examined by gender, ethnicity, English language learner status, and socioeconomic status.

Research Questions

The study was guided by the following research questions:

1. Do general education students in science co-teach classes demonstrate higher achievement than general education students in a science regular education classes?
2. Do general education students in social studies co-teach classes demonstrate higher achievement than general education students in a social studies regular education classes?

3. Do the gender, ethnicity, English language learner status, and socioeconomic status of general education students in co-teach classes impact the student achievement of those students compared to general education students in regular education classes?

Operational Definitions

The findings of this study are to be reviewed within the context of the following definitions of operational terminology:

Adequate Yearly Progress (AYP): Under Title I of the Elementary and Secondary Education Act (ESEA), each State must define what constitutes AYP of the State, and of all public elementary and secondary schools and local education agencies (LEAs) in the State, enabling all students to meet the State's student academic achievement standards, 20 U.S.C.

Co-Teach: A service delivery model in which the special education teacher and the general education teacher work together to plan and provide instruction and assess heterogeneous groups of students, including students with disabilities. The general education teacher must be highly qualified in the content area being taught. The special education teacher is certified in special education but may or may not be highly qualified in the content area in which is being taught.

English Language Learner Status: Students in the study who met the criteria according to Texas Education Agency (TEA) to be qualified as secondary English language learners in Texas. The student's score on the English oral language proficiency test was below the level designated for indicating limited English

proficiency. The student's score on the reading and language arts sections of the TEA-approved norm-referenced measure at his or her grade level was below the 40th percentile and/or the student's ability in English was so limited that the administration, at his or her grade level, of the reading and language arts sections of a TEA-approved norm-referenced assessment instrument or other test approved by TEA was not valid (TEA, 2007c).

Ethnicity: Students in the study were identified as African-American, Asian/Pacific Islander, Hispanic, Native-American or White according to the designation retrieved from the demographic information from the Public Education Information Management System (PEIMS) data.

Gender: Students in the study identified as either male or female according to the designation retrieved from the demographic information from the Public Education Information Management System (PEIMS) data.

General Education Students: Students without an identified disability.

Inclusion: The provision of education and related services to students whose IEP's stipulate that they receive special education in the general education classroom for all or a substantial part of the day.

Individualized Education Plan (IEP): A written statement for each child with a disability that is developed, reviewed, and revised, including (a) the child's present levels of educational performance; (b) measurable annual goals with benchmarks or short-term objectives; (c) special education and supplementary aids and services to be provided to the child, including the program modifications or supports for school personnel; (d) an explanation of the extent, if any, to which the child will not partici-

pate with students without disabilities in the general education classroom; (e) individual modifications in the administration of state or district-wide assessments of student achievement that are needed in order for the child to participate in such assessment; (f) the projected dates for the beginning of the services and modifications; (g) transitional service needs related to the child's courses of study; and (h) statements that describe how the child's progress toward annual goals will be measured and how the parents will be regularly informed of the child's progress (IDEA, 1997).

Individuals with Disabilities Education Improvement Act of 2004 (IDEIA):

On December 3, 2004, President George W. Bush signed into law the *Individuals with Disabilities Educational Improvement Act* (P.L. 108-446), the most recent reauthorization to IDEA. Highly qualified provisions in IDEIA of 2004 were aligned with NCLB of 2001.

Least Restrictive Environment (LRE): Requires States to have policies and procedures for ensuring that, to the maximum extent appropriate, children with disabilities are educated with children who are not disabled, and that special classes, separate schooling, or other removal of children with disabilities from the regular educational environment occurs only if the nature or severity of the disability is such that education in regular classes with the use of supplementary aids and services cannot be achieved satisfactorily.

No Child Left Behind of 2001 (NCLB): Reauthorization of the Elementary and Secondary Education Act implemented to close the achievement gap through accountability measures, flexibility and choice.

Public Education Information Management System (PEIMS): Encompasses all data requested and received by Texas Education Agency (TEA) about public education, including student demographic and academic performance, personnel, financial, and organizational information.

Pull Services: Pull-out or “resource” classrooms, where the student with the disability leaves the regular classroom to attend smaller, more intensive instructional sessions. Special education services may be provided in other settings at specific times during the day on a pull-out basis, such as resource rooms, occupational, physical and speech therapy, sensory rooms, rooms with special physical equipment, adaptive physical education, etc.

Service Delivery Model: The manner in which special education services are delivered.

Socioeconomic Status: Students in the study identified as socioeconomic status (SES) were students eligible for free or reduced meals based on a sliding scale of the total household and the household size (Food and Nutrition Service, 2007).

Students with Disabilities: Students with an Individualized Education Plan (IEP) on file with the district.

Teachers: Individuals who are certified by the Texas State Board of Educator Certification and currently employed by a school district to provide instruction to students in a Texas public school.

Texas Assessment of Knowledge and Skills (TAKS): A standardized test used in Texas primary and secondary schools to assess students’ attainment of reading, writing, math, science, and social studies skills required under Texas education

standards. It is developed and scored by Pearson Educational Measurement with close supervision by the Texas Education Agency. Though created before the No Child Left Behind Act was passed, it complies with the law.

Assumptions

The findings of this study were preceded by the following assumptions:

1. The researcher was impartial and objective in collecting and analyzing the data.
2. The assessments used in this study were a valid measure of achievement.
3. The methodology proposed and described offers the most logical and appropriate design for this particular research project.

Limitations

The population was limited to students in similar settings and learning conditions in an urban school district. The sample of student subjects within the school system significantly limits the ability to generalize the findings and may not be applicable to smaller rural districts or geographic regions.

The variation in how co-teaching models are implemented may affect the results with respect to variability of student achievement and ability to generalize.

The sample of each of the student groups compared was obtained from actual students attending respective group settings in a district where inclusion has been a major initiative.

Significance of the Study

One of the critical goals of No Child Left Behind (NCLB) federal legislation was to raise student achievement through accountability standards for *all* students. NCLB reinforces the proposition that *all* children have a right to a quality education. Today, in the context of NCLB, IDEA's injunction that students with disabilities entitlement to a free and appropriate public education in the least restrictive environment now requires that their educational setting be structured so that both their special needs and their academic ones be met in a single inclusive setting. Co-teaching is the institutional service delivery model most widely embraced to achieve these dual purposes through the provision to these students of instruction from two teachers, at least one highly qualified in the content area being taught and at least one highly qualified in special education, in an inclusive general education classroom (Rea & Connell, 2005; Weiss & Lloyd, 2002). The achievement of general education students in the co-teach service delivery model needs to provide positive outcomes for those students.

The findings of this study can provide guidance for teachers and special education personnel in the public school system regarding the placement of general education students in inclusive settings for student achievement. This information may also be helpful to administrators in programming and scheduling service delivery models for inclusion settings and the placement of general education students in those settings.

In addition, the study can provide information to parents and the community about the relevance of the inclusion setting to *all* students. There has been and continues to be widespread concern, especially among parents of general education

students involved in co-teaching arrangements, about the impact upon the quality of their general education students' academic progress when students with disabilities are included in the same classes. Such parents are concerned about the impact upon the adequacy of the educational resources available for their general education students when they are placed in classrooms with students with disabilities and those resources must be shared by both sets of students.

Organization of the Record of Study

This record of study is divided into five major chapters. Chapter I contains an introduction, statement of the problem, purpose of the study, research questions, operational definitions, assumptions and limitations, and significance of the study. A review of the literature is found in Chapter II. Chapter III is a description of the methodology employed, including the population, procedure, instrumentation, and data analysis. Chapter IV contains the analysis and comparisons of the data collected in the study. Finally, Chapter V is a summary of the findings from this study and conclusions and implications from those findings. Recommendations for practices and direction for future research are addressed in this chapter as well.

CHAPTER II

LITERATURE REVIEW

It is well known that many stakeholders in public education have concerns that the widespread movement towards inclusion of students with disabilities in general education settings might degrade the academic achievement of general education students who must now share the resources of their general education settings with their special needs classmates. Federal and state law now requires all students, including those with disabilities, have to show through standardized testing that they are proficient in designated skills and content areas. To assist students with disabilities, a co-teaching model that assigns two teachers to work together in a single classroom is often used.

There is a large body of research on co-teaching, but there appears to be inadequate literature speaking to the impact of co-teach classes on the academic achievement of secondary general education students in those classes. Consequently, there also exists a gap in the literature describing the differential impact of co-teach classes and non-co-teach classes on student achievement among general education students in relationship to differences in gender, ethnicity, English language learner status, and socioeconomic status. This literature review is an examination the body of existing research relating to inclusion through co-teaching, including the question of possible correlations between that institutional arrangement and student achievement among general education student populations.

This review of the literature is an examination of existing research relevant to topics which may be related to variables having a bearing on student outcomes in inclusive general education instructional settings. Such research falls into several categories. The first section will explore the literature relating to the No Child Left Behind Act (NCLB), including NCLB-mandated measures of student achievement, which could provide data to establish correlations of student academic achievement with each of the various instructional settings. Next, research into the development and evolution of the Individuals with Disabilities Education Act (IDEA) and its relevance to inclusion and student performance is reviewed. Following that section is a review of the literature involving inclusion and school improvement. A review of literature on effective instruction and students with disabilities is then considered. Defining co-teaching and delineations of its five commonly recognized structural forms is addressed. The next section is an overview of the literature on co-teaching. The final section is a discussion of co-teaching and student outcomes.

Both primary and secondary research sources relevant to possible correlations between instructional arrangements and student academic achievement outcomes were included in this literature review. It was important to the researcher to locate and evaluate research-based studies relevant to student outcomes and the inclusion of general education students and students with disabilities in co-teach classrooms.

No Child Left Behind

More than 40 years ago, Bereiter and Englemann (1966) theorized that all students can experience success, and that the failure of some students should bring

corrective attention to the instruction, not the students (Becker, 1971). If this theory is to be put to the test, then, the inclusion of students with disabilities in general education cannot be a peripheral issue confined within the special education programs of schools. If, indeed, all children are to learn, then special and general educators and communities must work together to identify common ground and develop shared agendas for creating schools that meet every student's needs (Sapon-Shevin, 1996). An example of such a shared agenda can be found in the requirements of the No Child Left Behind Act (NCLB). The No Child Left Behind Act of 2001 is the most prominent of recent congressional attempts to improve student achievement and otherwise reform elementary and secondary educational programs in the United States. It is part of a movement towards standards-based reform that includes students with disabilities. The act requires all states to develop accountability plans for academic achievement. Assessment and accountability for all students and teachers are included in the plans. Important facets of the plans are developing the curriculum and aligning it with the state standards. Thurlow, Lazarus, Thompson, and Morse (2005) cited the following reasons to include the disabled in standards-based reform and correlated assessments: "(a) to develop an accurate picture of education, (b) to make comparisons, (c) to help students with disabilities benefit from reform efforts, (d) to avoid consequences of exclusion, (e) to meet legal requirements, and (f) to promote high expectations" (p. 268).

The NCLB Act was sold as an initiative to improve student academic achievement among all students and to close the gaps in achievement between different student populations, which had long persisted without significant incentives and/or

sanctions to motivate meaningful change. The NCLB Act now makes our schools accountable for improved educational outcomes for all students. The Act specifically mandates testing and disaggregation of test results to show Adequate Yearly Progress (AYP) for students with disabilities, economically disadvantaged students, students from major racial and ethnic groups, and students with limited English proficiency. Only 5% of students in a state or local education agency may be given alternative tests, tests other than the state's standardized academic assessment instrument, and 95% of the students in each subgroup must take the state's standardized academic assessment instrument for a school to achieve required AYP.

These goals will be accomplished through an accountability model developed by each state to determine the specific standards that students must meet in order to be considered academically prepared. First, NCLB requires the identification of improvements that are needed. To determine whether the student body needs improvement, the school must determine whether their progress meets the AYP determined by the state benchmarks. The scores of most students with disabilities are not removed or discounted in the measurement of AYP. According to NCLB (No Child Left Behind Act of 2001, 2001), "States are required to separate student achievement data, holding schools accountable for subgroups of students, so that no child falls through the cracks" (p. 1).

To prevent an unacceptable number of students "falling through the cracks," the NCLB Act (2001) was written to provide schools needing improvement the information they need to get back on track by specifying the disaggregation of test scores. The testing data gathered from a school's student body will show whether a

sub-group of students is making adequate AYP. If the same subgroups of students fall below the minimum academic requirements 2 years in a row, then the school is considered in need of improvement. When a school's achievement data show that improvements are needed, the school system needs to make changes to the daily operations of the school. Such changes can affect the administration, curriculum, teachers, and students. The governmental officials who signed the NCLB Act (2001) into law did so to provide information to teachers and principals to improve teaching and learning. A state's department of education leaders was given the power to develop and create high quality assessments that were aligned with the state's curriculum. Using the state assessments, teachers can track those students who are exhibiting strengths and weaknesses and tailor lessons to address the weaknesses. This makes it easier to determine what a student knows and does not know but also places an emphasis on the scores earned on the standardized tests.

Thurlow (2002) wrote that "the greatest promise of standards based reform for students with disabilities ... is that it will result in programmatic and instructional improvements" (p. 199). Since the application of uniform standards in special education is new to the field of education, which has traditionally relied on individualized standards as outlined in each student's Individualized Education Plan, Thurlow's expectation of change is reasonable (McLaughlin & Thurlow, 2003). As a result of NCLB, students with disabilities would have to meet the same standards as *all* other students. The standards of students with disabilities would no longer rely on their Individualized Education Plan as it has in the past.

Among the salient elements of NCLB are requirements that all students have highly qualified teachers and be given the opportunity to attend high-quality schools. Highly qualified teacher provisions as defined by No Child Left Behind required that teachers (1) hold a bachelor's degree, (2) obtain full state licensure or certification, and (3) demonstrate competency in core subject matter knowledge (Chalk Talk, 2003).

Also included in the NCLB enactment is the requirement that within a decade, all students, including those with disabilities, will perform at a proficient level on state academic assessment tests. While the Individual with Disabilities Education Improvement Act of 2004 (IDEIA), legally referenced as IDEA 2004, requires a free and appropriate public education (FAPE), it sets no outcome goals for that free and public education. IDEA does, however, specify requirements which schools must meet for students with disabilities.

Historical Development of Individuals with Disabilities Education Act Requirements

The Education for All Handicapped Children Act, also known as P.L. 94-142, was passed in 1975. This law mandated that students with disabilities were to be given certain rights: (a) nondiscriminatory testing, evaluation, and placement procedures; (b) education in the least restrictive environment; (c) procedural due process; (d) a free education; and (e) an appropriate education (Yell & Rogers, 1998). At the time that P.L. 94-142 was being written, many government officials had their own views

about how special education should look. The following quote supports one of the key principles underlying NCLB that *all* children have a right to a quality education.

The denial of the right to education and to equal opportunity within this nation for handicapped children—whether it be outright exclusion from, the failure to provide an education which meets the needs of a single handicapped child, or the refusal to recognize the handicapped child’s right to grow—is a travesty of justice and a denial of equal protection under the law. (Senator Harrison Williams, CR, 1974, p. 15272, as cited in Yell & Rogers, 1998)

Public law 94-142 (1975) was amended and named the Individuals with Disabilities Education Act in 1990 (IDEA). Although PL 94-142 dramatically improved education for students with disabilities, simple access to an individualized education proved an insufficient foundation for success, especially when the general education community began to seek higher standards and accountability for all students. With the focus on individualized programming, students with disabilities were often excluded, to their detriment, from those standards and high expectations.

At the same time, all references to “handicapped children” were changed to “children with disabilities.” The amendment added the categories of *autism* and *traumatic brain injury* to the list of disabilities and expanded the list of related services that could be provided to support students’ ability to benefit from their individualized educational program. Another highlight of the amendment was the establishment of a zero-reject policy for students with disabilities. In other words, there would not be any students with disabilities, regardless of their disability, who could not be served. The provision required that students with disabilities who were previously excluded and who were still within compulsory education age had to be found and served. All states were required to implement child-find activities to locate

and serve children with disabilities from birth through 21. The definition of FAPE was refined, as were parent notification and due process rights. Confidentiality of records and nondiscriminatory evaluations were re-emphasized.

The Individual Education Plan (IEP) contents were readdressed and new requirements to provide more specific and measurable levels of performance and expectations were added. These documents also had to include statements regarding the extent to which a student would participate in general education programs and transition services. The act articulated that students must be educated in the least restrictive environment (LRE) that is consistent with their educational needs. That is, they must be educated to the maximum appropriate extent with students without disabilities. Finally, the amendments re-established a mandate for training all teachers in meeting the needs of students with disabilities.

In June of 1997, Congress completed another revision of the act. The Individuals with Disabilities Act Amendments of 1997, PL 105-17, attempted to remedy problems with the prior law that were identified from the field and through the court rulings. In general, it established higher expectations for students with disabilities by ensuring access to general education curricula. Part of this process was the requirement that general education teachers play an increased role in the development of the educational program for students with disabilities. It also mandated that all educators refocus on teaching and learning by reducing unnecessary paperwork and procedures. The amendments required increased attention to racial, ethnic, and linguistic diversity through improved evaluation procedures and data collection, reporting, and analysis. They also addressed the issue of safe schools through an attempt to clarify discipline

procedures for students with disabilities. The law also reaffirmed the students' right to an education in the least restrictive environment. Most significantly, however, the amendments strengthened the role of the parents. It gave them increased access to and responsibility for all levels of decision making for a student with a disability.

Finally, the IDEA was reauthorized again starting in 2001 and completed in December 2004. Even though there were not any significant changes in the revisions of IDEA 2004, there was much delay in the reauthorization. One reason for the delay was that the Senate and the House of Representatives passed separate bills to reauthorize the Individuals with Disabilities Education Act (IDEA), and it took the House and Senate some time to form a conference committee to review both bills and then reconcile the two versions of IDEA. It is now titled Individuals with Disabilities Education Improvement Act of 2004, but it is nevertheless legally referenced as IDEA 2004. The way that the act was worded has changed to conform with the cultural norms of society. The wording became more sensitive to those who have disabilities. Some of the key components of IDEA 2004 have more closely aligned the 30-year-old special education laws with the provisions of NCLB. The foundation of the IDEA 2004 was the President's Commission on Excellence in Special Education report, which was released on July 1, 2002. One of the major recommendations of the President's Commission was for IDEA to return to its educational mission and focus on outcomes and results instead of regulations and procedural compliance (Faust, 2005). The findings of Congress as outlined in IDEA 2004 call for more accountability for students with disabilities and an emphasis on high expectations and improved educational outcomes.

To accomplish this, the framers focused the use of resources on teaching and learning and not on paperwork and legalistic considerations, which have not contributed to improved educational results for these students in the past. Similar to the provisions of NCLB, special education instruction and related services must now be based on peer-reviewed research, to the extent practicable. The reauthorized IDEA also addresses the early identification and intervention mandates of NCLB. The parallels between the two laws are clear and continue to challenge school districts to create a unified system of effective, evidence-based instructional practices for all students (Boscardin, 2004; Faust, 2005).

Standards for special education teachers to become “highly qualified” were established in the act and complete the initiative from NCLB to assure that all educators are of consistently high quality in the core subject areas. According to Hardman, Rosenberg, and Sindelar (2005), “The major purpose in amending IDEA 1997 was to align current law with the accountability provisions in NCLB, including what it means to be a highly qualified special education teacher” (p. 17). Texas requires teachers who teach special education to have a special education certificate. NCLB requires teachers who teach special education to be “highly qualified” in the subjects they teach. For example, if a special education teacher teaches math, science, and English to special education students in grades 9-12, the teacher would have to prove competency in each of the three subjects. Only the teacher-of-record has to be “highly qualified,” however. The teacher-of-record is the teacher responsible for the class, the teacher who gives assessments, issues grades, etc. If a special education teacher were to pull special education students out of a regular class for supplemental

help or tutoring, she may not have to be highly qualified. Neither need a special education teacher teaching under the supervision of a highly qualified teacher of record in a co-teach classroom be highly qualified in the class' subject matter areas. Legislation has also called for districts to develop programs that are more inclusive for students with exceptionalities (Individuals with Disabilities Education Act 2004; No Child Left Behind Act, 2001).

Relationship between Inclusion and School Improvement

As a result of No Child Left Behind and the even more recent mandates of the newly revised Individuals with Disabilities Education Improvement Act of 2004, which defines "highly qualified" in new ways, it has become increasingly important for schools to utilize their resources in more effective and creative means. With the recent alignment of the two acts (IDEA, 2004), these two laws together set in motion the process for students with disabilities to be held accountable and educated in a rigorous standards based curriculum in the least restrictive environment.

Through standards based reform over the last decade, IDEA and NCLB have been instrumental legislative acts that have pushed policy makers, states, schools and teachers to raise expectations for students with disabilities. One primary outcome from both IDEA and NCLB is a focus on improved student performance and a more integrated model for special education (McLaughlin & Thurlow, 2003). The term *inclusion*, as defined by the National Information Center for Children and Youth with Disabilities (as cited in Burstein, Sears, Wilcoxin, Cabello, & Spagna, 2004) refers to the "process and practice of educating students with disabilities in the general

education classroom of their neighborhood school ... with the supports and accommodations needed” (p. 104).

Inclusive education, according to this most basic definition, means that students with disabilities are supported in chronological age appropriate general education classes in their home schools and receive the specialized instruction delineated by their individualized education programs (IEP’s) within the context of the core curriculum and general class activities. Inclusion is the full acceptance of all students and leads to a sense of belonging within the classroom community. Inclusion provides students with disabilities an education in the same classroom environment as with their non-disabled peers in order to create an academic and social learning environment. This heterogeneous classroom of learners would allow for the acquisition of knowledge at different levels with varying degrees of proficiency (Bloom, 1956).

Researchers with the National Center for Educational Restructuring and Inclusion (1995) completed a national study of school districts which produced evidence that students with disabilities were making academic gains. These gains included improved performance on standardized tests and mastery of IEP goals as well as improved grades, on-task behavior, and motivation to learn. On the other hand, data from the United States Department of Education (1995) revealed that many secondary students with disabilities, especially in ninth and tenth grades, experienced high rates of failure.

An additional question that has arisen throughout the inclusion movement is that of the impact of inclusion of a student with disabilities on the achievement of non-disabled students in the class. One study on the effects of placement in an inclusive

classroom on the academic performance of students without disabilities was performed by Sharpe, York, and Knight (1994). They conducted a pretest-posttest study. Academic performance was measured by the Science Research Associates (SRA) Assessment Survey, an achievement test in reading, language arts and math, and reading levels as defined by the reading series. Using a one-way analysis of variance (ANOVA), results indicated no statistically significant differences in academic performance of students who were members of classes that included a child with disabilities.

More importantly, the inclusive learning process would function as a social process in which all stakeholders would participate in joint goal-oriented activities (Stone & Reid, 1994). Villa, Thousand, Nevin, and Liston (2005) reported that more students with disabilities than ever are being educated in the general education classroom, which opens the door for new collaborative relationships and improved access to curricula, instruction and assessment all leading to greater student outcomes for students with disabilities

Mastropieri and Scruggs (2001) recommended placing an emphasis on higher-level content knowledge, independent study skills, and the pace of secondary classrooms as measures for successful inclusion. The authors describe successful peer mentoring, co-teaching and strategy instruction as key elements of effective secondary inclusive classrooms. Collaboration, including co-teaching arrangements, can be a key component to the success of students with disabilities in inclusive settings (Cawley, Hayden, Cade, & Baker-Kroczyński, 2002).

Effective Instruction and Students with Disabilities

Instruction that is less effective can significantly lower a student's performance over time, even if the student later gets more competent instruction. For example, "the average reading scores of a group of 6th graders who had three of the most effective instructors three years in a row rose from just under the 60th percentile to about the 75th percentile. A similar group of students who had two of the least effective instructors, followed by one of the most effective ones, dropped from about the 60th percentile to just below the 50th percentile" (Archer, 1998, p. 24).

Researchers looking into classrooms (Briggs & Thomas, 1997; Moll, 1988) have found that excellent instruction uses a wide variety of instructional philosophies, methods, and strategies and incorporates them into the delivery. Hence, the co-teaching model of inclusion aides in combining experience and knowledge of two teachers for the delivery of instruction in one classroom, providing expertise and experience as opportunities for students to learn (Darling-Hammond, 1996).

Collaboration between teachers and other school professionals provides a greater depth and breadth of knowledge in developing the wide variety of intervention plans than can any one person acting alone (Rosenfield, 1992; Zins, Curtis, Graden, & Ponti, 1998). Collaboration in decision-making and problem-solving empowers instruction (Schlechty, 1990; Wiggins, 1989).

Current research indicates that special education students who are classified Learning Disabled do not differ from low-achieving general education students in the characteristics that lead to the lack of skill development (Fletcher et al., 2001; Fuchs, Fuchs, Mathes, Lipsey, & Roberts, 2001). The implications of this research are direct,

clear, and sensible. School accountability must include instructional effectiveness as it influences student academic gains and achievement. Performance data can play an important role in aligning policies, resources and instructional strategies (Drury & Doran, 2003; McCaffrey, Lockwood, Koretz, & Hamilton, 2003).

It is through effective instruction that students will be able to close the gap between achievement and failure, regardless of student disabilities (Haycock, 1998; Jenkins & O'Connor, 2001; Lyons et al., 2001; Gresham, 2001). All students can gain in their knowledge and achieve more each day with effective instruction. Even though there is research which indicates that, through effective instruction, students will be able to close the gap between achievement and failure regardless of student disabilities, there still exists a lack of research as to the impact a secondary co-teach class has on the student achievement of general education students in those classes.

Definition and Structure of Co-teaching

As Weichel (2001) noted, numerous models of collaboration for the general education classroom have been created to meet the needs of all students and one of the most utilized collaborative models is co-teaching. *Co-teaching* refers to a type of instruction which assists successful inclusive schools to collaborate between special and general education and provide integrated services for all students (Bowe, 2005; Burstein et al., 2004; Salend, Gordon, & Lopez-Vona, 2002).

Co-teaching has been defined as an instructional delivery approach in which general and special educators jointly share responsibility for planning, delivery, and evaluation of instruction for a shared group of general and special education students.

These general and special educators work in a coactive and coordinated fashion, which involves the joint teaching of academically and behaviorally heterogeneous groups of students in integrated settings (Bauwens & Hourcade, 1991; Bauwens et al., 1989; Friend & Cook, 1992; Walther-Thomas, Bryant, & Land, 1996).

A variety of co-teaching models, also known as *teaming*, *team teaching*, *collaborative* and/or *cooperative teaching* (Dieker & Murawski, 2003) are being implemented to address the behavioral and academic issues general and special educators face educating students with mild disabilities in the general curriculum. Co-teaching has become one of the many collaborative strategies that schools are implementing in an effort to meet the needs of all students within the educational framework that we call school (Snell & Janney, 2005; Villa, Thousand, & Niven, 2004). Friend and Cook (2007) defined *co-teaching* as a service delivery model for providing special education and related services to students with disabilities in general education settings.

Characteristically, co-teaching increases instructional options for students, improves program intensity and continuity, reduces the stigma for students and increases professional support (Cook & Friend, 1995). The traditional co-teaching models give teachers the opportunity to address students' specific academic and behavioral needs while still exposing them to the content and general education setting. Both Dieker and Little (2005) and Mastropieri and Scruggs (2001) emphasized the benefits of incorporating instruction strategy into a successful co-teaching partnership for maximum benefits. Co-teaching is among the service delivery models

typically implemented in the general education classroom (Rea & Connell, 2005; Weiss & Lloyd, 2002).

Co-teaching is a service delivery structure in which teachers with different knowledge, skills, and talents have integrated responsibility for designing, delivering, monitoring and evaluating instruction for a diverse group of learners in a classroom (DeBoer & Fister, 1995). Although co-teaching integrates components of collaboration and team teaching, it is not solely collaboration or team-teaching.

Typically, co-teaching is used to provide services for students with mild to moderate disabilities in the general education setting (Sileo, 2003). General and special educators are present while co-teaching in the general classroom, thus maintaining shared participation in classroom instruction (Bauwens et al., 1989). Research shows that general educators have expertise in knowledge of the curriculum while special educators have expertise in instructional processes used to teach individual students who may learn atypically (Adams & Cessna, 1991; Reeve & Hallahan, 1994). There are a variety of co-teaching approaches. Each approach is designed to enhance different types of activities for the learning environments.

There are five basic co-teaching structures common in the literature. These include (a) one teach, one assist, (b) station teaching, (c) parallel teaching, (d) alternative teaching, and (e) team teaching (Friend, Reising, & Cook, 1993). Descriptions of each type of co-teaching structure follow.

- *One teaching/one assisting.* In this model, one teacher, typically the general education teacher, takes the instructional lead and teaches the content, while the other teacher, typically the special education teacher, simultaneously

monitors, observes, or individually assists students. This model is often utilized during the beginning stages of co-teaching (Friend et al., 1993).

- *Station teaching.* In this model, teachers create three independent work stations in the classroom, two that involve teacher-directed instruction and one that involves independent seatwork. The students are separated into three groups and rotate through the three stations during the class period. This model allows teachers to provide more individualized instruction to a small group of students still promoting independent work (Friend et al., 1993).
- *Parallel teaching.* In this model, the class is divided into two equal heterogeneous groups, each taught the same content at the same time by one of the two teachers, either the general education teacher or the co-teacher. This model requires teachers to jointly plan a lesson to ensure that they pace the instruction so both groups of students start and finish at the same time with the same level of mastery. This option allows teachers to design the lesson utilizing their unique teaching styles and aligning the method of teaching towards the individuals needs of the students (Friend et al., 1993).
- *Alternative teaching.* In this model, the class is purposefully divided into two groups in order to meet the individual needs of all students. Commonly, the larger group will participate in a review session and a smaller group will be re-taught concepts, have particular skills re-emphasized, or even have a lesson previewed (Friend et al., 1993).
- *Team-teaching.* In this model, the general and special education teacher are both actively engaged in instruction for the whole class and feed off one

another by finishing each other's sentences, clarifying each other's comments, or answering student questions (Friend et al., 1993).

Effective teaching strategies in the different co-teaching structures are identified by how they are implemented and in what frequency the teachers practice them (King-Sears & Cummings, 1996). Additionally, the degree of support (Villa, Thousand, Meyers, & Nevin, 1996) in co-teaching and ability to co-plan with the collaborating teacher (Idol, 1997) in co-teaching are key factors in establishing a successful co-teaching instructional delivery model. Variations among the co-teaching models and practices appear to exert an interesting influence on the co-teaching experience of all those directly involved.

Overview of Co-teaching Studies

Researchers have studied co-teaching in elementary, middle, and high schools through the experiences of students, teachers, administrators, and parents. Harris et al. (1987) described the implementation of a pilot program where special education teachers provided services to the general education teacher and high school students with disabilities in the general education classroom, now referred to as co-teaching. The study involved special education teachers ($n = 6$), general education teachers ($n = 33$), and students with disabilities ($n = 83$). Data sources included observations, questionnaires, and data collected from student files. Findings suggested that the implementation occurred in stages which included (a) development of the program philosophy, (b) recruitment of general education teachers, (c) establishment of a common philosophy between general and special education teachers, (d)

establishment of teacher roles by meeting the unique needs of each general education teacher, and (e) evaluation of the program on teachers' perspectives and students' perspectives and outcomes.

Overall, teachers and students were positive about co-teaching. Students reported that they "liked school much more during the year of the pilot program than during the previous year" (Harris et al., 1987, p. 148). Furthermore, students with disabilities received higher academic and citizenship grades in the pilot program when compared to the previous year. Teachers reported that they enjoyed working with the special education teachers and students were positively impacted due to the presence of the special education teacher.

Ward (2003) investigated general educator's ideas about collaboration with special education teachers in the middle and high school setting. Twenty-two general education teachers participated in 10 focus group interviews which explored the definition of collaboration and how and why general educators work with special educators. Ward provided the participants with an Effective Collaborators' Checklist, which was a research based checklist of key components, such as communication skills, problem solving skills, and interpersonal skills, of effective co-teaching. The majority of general educators defined collaboration using the components from this checklist and stressed the importance of co-planning and a shared sense of ownership. However, their definitions lacked the concept of compatible personalities. Furthermore, they viewed the collaboration process as a continuum from consultation to co-teaching and the individual needs of the student determined which process was

implemented. Although lack of time and administrative support were seen as barriers, overall, co-teaching was perceived as a benefit to all teachers and students involved.

Some studies have shown that co-teaching meets both the social and academic needs for students with exceptionalities in the least restrictive environment (Walsh & Snyder, 1993). Walther-Thomas (1997) reports on a three-year study of elementary and middle schools that utilized co-teaching as an integral part of their delivery model. Classroom observations, interviews, review of school documents, and informal contacts were used to gather data. The four major benefits identified for students with disabilities included enhanced self-confidence and self-esteem, improved academic performance, better social skills, and stronger peer relationships. Academic performance was referred to in terms of success at learning skills as well as maintaining passing grades.

Research has suggested that co-teaching has been widely accepted by teachers who advocate for the practice with little quantitative research to back it up (Mastropieri & Scruggs, 2004). Research has primarily focused on the unique experiences of co-teachers including the various ways schools implement co-teaching by relying on teacher perceptions of implementation and inclusive beliefs (Friend & Reising, 1993; Mastropieri & Scruggs, 2004; Murawski & Dieker, 2004; Murawski & Swanson, 2001; Vaughn, Bos, & Schumm, 2003; Weiss & Brigham, 2000; Zigmond, 2001).

Mastropieri et al. (2005) investigated experiences of several co-teachers, consisting of general and special education teachers, in science and social studies content area classes through observations, interviews, and document analysis. A total of four

case studies, (a) upper elementary and middle school earth science, (b) middle school social studies, (c) high school world history, and (d) high school chemistry, were completed through observations ranging from one semester to two years. In addition, interviews, field notes, videotapes of classes, and artifacts were examined. Overall, themes of the case studies included academic content, influence of high-stakes testing, and compatibility of co-teachers.

Findings indicated that in some cases, collaboration was extremely effective and promoted success for students with disabilities, where in other cases barriers existed that prevented successful collaboration. First, the level of the special education teacher's content knowledge created a barrier when it was less than the general education teacher's content knowledge. Due to this imbalance, which occurred more frequently in the upper grade levels, the general education teacher would quickly become the lead teacher and the special education teacher would assume the role of an instructional assistant. Second, high-stakes testing created an environment where teachers believed covering all of the content was more important than pedagogical features, which were commonly implemented by the special education teacher, and ultimately diminished the role of the special education teacher. Third, compatibility between the co-teachers was a vital component to the success or failure of co-teaching. When co-teachers were able to get along and work well together, students with disabilities were more likely to be successful in inclusive settings. When co-teachers were unable to work together and conflicts arose, however, it was much more challenging for students with disabilities to succeed in inclusive settings.

Secondary special and general education co-teachers who cooperatively planned to accommodate learning disabled students in the general education classroom were studied by Feldman (1998). More specifically, pre-planning, interactive planning, and post-planning phases of co-teaching were examined in relation to teacher, environment, and student factors. Observations took place during the planning process and teaching of the lesson, while interviews were conducted immediately following the lesson. During the pre-planning stage, co-teachers planned lessons in a very traditional way, including their individual roles and accommodations for students with disabilities. One team primarily focused on the content and instructional approach while another team focused primarily on social/behavioral elements.

Overall, approximately 74% of their time was devoted to student factors, 20% to teacher factors, and only 6% to environmental factors. During the lesson, both teachers monitored students to ensure on-task behavior. They monitored the understanding of the lesson to a lesser extent; furthermore, both teachers often provided specialized accommodations to students with special needs. In post-planning, the teachers spent 69% of their time discussing student factors, 23% discussing teacher factors but only 8% discussing environmental factors. Of the time spent discussing student factors, 66% was spent on general content area issues for the class as a whole, whereas only 12% was spent discussing specific academic problems for students with special needs. As for the type of co-teaching in one teaching-one assisting, in team-teaching, and in taking turns as the lead teacher, each team differed greatly on their approach; however, there were very few changes from lesson to lesson once the teacher roles were established.

In an article reviewing team teaching and school-based problem solving teams, Welch and Sheridan (1999) identified 40 articles, 40% of which were anecdotal reports, 37.5% of which were technical guides, 30% of which employed empirical research, and 15% of which were position papers. The results of the article review revealed that 47.5% of the articles found positive outcomes from team teaching and school-based problem solving teams. None of the articles reported negative outcomes, although 40% showed no significant change and 12% of the articles showed mixed results. Welch and Sheridan (1999) commented, "Outcome information was generally positive but typically limited to teacher satisfaction and teacher testimonials" (p. 44).

In a study designed to quantify social outcomes, Vaughn, Elbaum, Schumm, and Hughes (1998) utilized two matched schools in an urban school district, each representing a collaborative service delivery model. Rating scales completed by 185 elementary students with and without learning disabilities who participated in either a co-teach model or consultative/collaborative model were analyzed in terms of peer acceptance, friendship quality, self-concept, and social skills (Vaughn et al., 1998). The co-teach setting consisted of a general education teacher and a special education teacher who co-taught in the same classroom for the entire school day. The consultation/collaboration setting consisted of a part-time teaching assistant for 4 hours per day and a special education teacher for 1 to 2 hours per day. In the co-taught model, students identified as learning disabled represented 18% of the participants, while in the consultative/collaborative model students identified as learning disabled represented 13.5% of the participants (Vaughn et al., 1998). A MANOVA was conducted on measures of social functioning. Researchers found the

consultative/collaboration model showed significant differences between the results of the two service delivery settings. Data indicated higher peer acceptance and friendship quality in the consultative/collaborative model. Results showed no significant difference in peer acceptance or friendship quality in the co-taught model (Vaughn et al., 1998).

Examining students' perceptions in terms of learning presents interesting findings for professionals. In focus groups designed to identify underlying student and parent perspectives, Gerber and Popp (1999) analyzed the views of 123 students with and without learning disabilities and their parents enrolled in elementary, middle and high schools from five school districts containing a combination of urban, suburban, and rural schools. Reports indicated that both students with exceptionalities and their general education peers held positive views of co-teach models in terms of organization and learning strategies. Parents of non-disabled students appreciated the diversity in the classroom while parents of students with exceptionalities saw benefits in increased self-esteem for their children (Gerber & Popp, 1999).

In an investigation comparing the performance of learning disabled middle school students in a suburban school district receiving service in either an inclusive co-teach program or a pull-out program, Rea, McLaughlin, and Walther-Thomas (2002) found the two programs differed significantly. Students in the co-taught program earned higher grades and standardized test scores and attended more days of school than those in the pull out program.

There are few studies examining the impact of co-teaching as a model on student outcomes at the secondary level (Keefe & Moore, 2004). Yet, large-scale studies

investigating the impact on high school student outcomes are necessary in an era when cost effectiveness in terms of student performance achievement drives educational policy. The legislative call for more inclusive programs and an emphasis on accountability systems is a powerful rationale for examining student achievement of secondary students in general education and in special education co-teach classes.

Co-teaching and Student Outcomes

By definition, *outcomes* are results, effects, or consequences of events, processes, or experiences. Schleisman and King (1990) found the following definitions of outcomes through their research: (a) products of a curriculum, a structured series of intended learning experiences and (b) end products of learning that result in changes in student behavior. Ysseldyke, O'Sullivan, Thurlow, and Christenson (1991) defined an *outcome* as the result of interactions between individuals and their schooling experiences. *Educational experiences* were described as the learning experiences that were planned, managed, or organized by schools to serve children. *Interactions* were described as the products of recurring interaction between the individual and school experiences, influenced by the individual's life experiences. *Results* were described as the effects of learning experiences such as achievement, graduation, and dropout rate.

Although outcomes of education became a significant concern of educational reform during the 1980s, Ysseldyke, Thurlow, and Bruininks (1992) discovered that general education policy was being established with limited consideration of students receiving special education services. Even though they found the language of reform policies stressed a need to concentrate on the quality of educational experiences for

students with disabilities, Ysseldyke et al. (1992) posed the question, “Should we measure outcomes in the same domain for all students with disabilities, no matter how severe their disabilities?” (p. 28).

Research on student outcomes report mixed findings (Rea et al., 2002; Vaughn et al., 1998). Research findings on the effectiveness of co-teaching remain inconclusive (Mastropieri & Scruggs, 2001; Murawski & Swanson, 2001; Weiss & Brigham, 2000; Zigmond, 2001). Some studies have indicated that students with disabilities in co-teach classes showed larger gains in math and equal gains in reading when compared to students receiving pull-out services (Bear & Proctor, 1990). Consultation plus co-teaching was found to be as effective as other service delivery models (Marston, 1996; Schulte, Osborne, & McKinney, 1990). Boudah, Schumaker, and Deshler (1997) found that the performance of students with high-incidence disabilities worsened during co-teaching. Other studies have indicated that for high-risk students (Dieker, 1998) and students with learning disabilities (Rice & Zigmond, 1999; Welch, 2000), co-teaching is an effective practice.

In relation to students without disabilities, Hunt, Staub, and Alwell (1994) used a pre-test/post-test design to compare the mathematics achievement of 10 students without disabilities participating in cooperative learning groups with classmates with disabilities to a group of students without disabilities who worked in cooperative learning groups with classmates without disabilities. They found that both groups increased their mastery of targeted mathematics objectives. Students with disabilities performed as well as the students without disabilities in the control group. This study,

focused primarily on the performance of students with disabilities, might indicate an instructional strategy that warrants further investigation for the inclusive classroom.

In a middle school, a total of 67 students with disabilities were investigated in a quantitative study by Gale (2005) to determine if there were differences in school performance in regard to pull-out and co-taught placement. Students were matched according to length of time receiving special education services, allowable accommodations, grade-level, goals and objectives in Individual Education Plans (IEP), chronological age, and intelligence quotients. In other words, the students studied were similar. Further, descriptions of the school environment were detailed illustrating how students received specialized services. Results indicated no significant differences on standardized tests or in attendance. This finding is significant because it speaks to a considerable range of students. What the study does not indicate is how students without disabilities performed in these same areas.

Another middle school study investigated the effects that co-teaching had on the achievement of students with mild to moderate disabilities in a 7th grade language arts class (Knudson, 2005). In this study, the researcher compared students with disabilities using diagnostic tests, teacher-made tests, and class grades. There was no significant difference between the diagnostic pre-and post-tests. Students with disabilities receiving instruction in a co-taught class did not show improvement or regression on high-stakes testing. In fact, findings indicated that students scored basic to below basic level on both assessments; however, students with disabilities did score higher on teacher-made tests and class grades. In this regard, students with disabilities scored at a proficient to advanced level. An interesting result of this study

was that students' intelligence quotients did not predict student progress, though student motivation did. Both the general and special educators perceived that personal motivation correlated with higher scores on teacher-made tests and class grades.

Haselden (2004) assessed whether co-teaching had the potential for increased academic achievement for all students. In this quantitative study, achievement results for typical and at-risk students in four traditional high school biology classes were analyzed. One class was co-taught, while a second received support from a special educator. The remaining two classes received traditional instruction from one general science teacher. Results indicated no statistically significant differences in passing rates for students in all four settings.

Another study using four school sites focused on secondary English classes taught by general and special educators. The purpose of this quantitative study was to determine if individual needs of students with disabilities were met in a co-teaching environment. Murawski (2006) found no significant differences in academic outcomes for reading and writing assessments for students with learning disabilities in the co-teaching environment as compared to students with disabilities in the mainstream class, in a pull-out class, or in a general education setting. A major outcome stressed that teachers who reported to be following a co-teaching model may not have supports such as common planning time or training on various instructional practices, and that these factors might at least partially account for the lack of significant differences found among the four placements.

During a three-year period Belmarez (1998) studied the effects of co-teaching on mathematics achievement with middle school students with and without disabilities.

Further, the researcher wanted to relate students' final course grade averages to the Texas Learning Index (TLI), which is a score that describes how far a student's performance is above or below the state's passing standard [Texas Education Agency (TEA), 2007a). Three groups were used in this quantitative study. The first was comprised of a general mathematics teacher and a special educator who co-taught the mathematics class to students with and without disabilities. Another group was comprised of students in a pull-out mathematics class taught by a special education teacher. The last group contained students in the general education class taught by a mathematics teacher. Raw scores from the Texas Assessment of Academic Skills Test (TAAS), final grade averages, and TLI scores were analyzed.

The findings of this study (Belmarez, 1998) suggested that students with disabilities in the co-taught class did not produce greater mathematic achievement. Another aspect of this study featured students without disabilities in a co-taught classroom. In this investigation, students without disabilities also did not show any significant difference in mathematic achievement. Further, students placed in a co-taught classroom did not achieve greater academic gains than those placed in a pull-out class; however, students with learning disabilities in a co-taught mathematics class scored significantly higher on standardized test scores (TAAS) than those in a pull-out classroom. The final course grade averages and TLI scores were significantly lower for students with disabilities in a co-taught classroom than the scores for such students receiving instruction in a pull-out classroom.

Another middle school mathematics study involving students with learning disabilities investigated the effects of co-teaching on student participation (Baldwin,

2003). A sixth-grade co-taught mathematics class was the site of this study focusing on math calculation and math reasoning. Findings of this brief study indicated that students with disabilities were not negatively affected when co-teaching was introduced. According to this study, student performance did not move forward; however, it did not go backwards either.

A rural district in New York served as the site for evaluating the success of co-teaching (Wischnowsk, Salmon, & Eaton, 2004). Data on students achievement was one of several categories studied during a two-year period at an elementary and middle school for this quantitative study. This school district took a strong stance for providing co-teaching as the least restrictive environment of choice. Not only were employees given training, but two university professors were hired to design an evaluative tool to assess the success of co-teaching. Their findings revealed that the data on student achievement suggested that students with disabilities did not show any change in the co-taught classroom as compared to a more restrictive environment.

The limited available body of research on academic performance of students with disabilities reports investigations of the outcomes of co-taught language arts, mathematics, and biology classes. This body of research compares these outcomes with those of general education, pull-out, and mainstream classes. Results reveal that students with disabilities showed no significant performance differences on standardized tests (Gale, 2005; Knudson, 2005), reading and writing assessments (Murawski, 2006), math reasoning and calculation measures (Belmarez, 1998), attendance rates (Gale, 2005), passing rates (Haselden, 2004), overall achievement scores (Wischnowski et al., 2004) and participation (Baldwin, 2003).

Research in these areas has been conducted with the middle school population more frequently than either the high school or elementary populations. Weiss and Brigham (2000) identified over seven hundred studies that described co-teaching in some way, but only 23 that provided evaluative or interpretive data, and far fewer that addressed secondary classrooms. In some cases, co-teaching was generally associated with acceptable academic outcomes for students with disabilities and teacher satisfaction with the arrangement (Walther-Thomas & Carter, 1993). There has been, however, little research conducted involving general education students at any level and their academic achievement in co-teach classes. In fact, only two studies on academic performance at the high school level and one at the elementary, which was actually combined with a middle school study, could be located. No existing studies investigating gender, ethnicity, English language learner status or socioeconomic status of students, with or without disabilities in co-teach classes, could be found. Moreover, no existing studies were found which examined the differential achievement outcome of co-teach and non-co-teach classrooms, using the current standardized assessment in Texas, the Texas Assessment of Knowledge and Skills (TAKS).

Summary

In summary, special education has made progress in educating all students with disabilities in the least restrictive environment, with the emphasis placed on providing access to the general education curriculum. Because this inclusion of students with disabilities in the general education settings will continue, research on the effects of including students with disabilities in the general education settings on the

achievement of general education students is needed. With all that the general education curriculum has to offer both general education students and students with disabilities, merely providing access to the knowledge is clearly not enough. General and special educators need to facilitate programming for students that is outcomes based within the context of verifying successful mastery of the general curriculum (Deshler et al., 2001).

Federal legislation, namely NCLB (2001), requires educators to become accountable for the success of *all* students, including those with disabilities. An increase in the number of students with disabilities educated in general education classes means that teachers also must have the skills and knowledge necessary to instruct these students and the general education students at the same time with a requirement of effective student outcomes for *all* students (U. S. Department of Education, 2002).

In order to meet the needs of students with disabilities, many schools are implementing a co-teaching model presumed to effectively serve the needs of a diverse student population. Advocates of the co-teach model argue that co-teaching is an approach that closely follows the intent of the federal laws governing special education practices. The question of whether the co-teach approach does in fact effectively serve the goal of improved academic achievement for both students with disabilities and general education students is clearly an important subject for empirical academic investigation.

But there is currently an insufficiency in the existing research on the impact the co-teaching service delivery model has on achievement of secondary general education students in co-teach classes. Axiomatically, there is no existing research on the

impact of the co-teach service delivery model on the academic achievement of general education students in respect to gender, ethnicity, English language learner status, and socioeconomic status in comparison to students in regular education classes. There is also a lack of existing research in the content areas of science and social studies relative to co-teach classes at the high school level. The TAKS science and social studies test administered to all tenth grade students has added increased expectations and accountability for *all* students and school districts. This research was conducted to develop a preliminary empirical insight into this question of the actual impact of co-teach classes on the academic achievement of secondary general education students enrolled in such co-teach classes. This study was also designed to correlate the academic achievement of secondary general education students in co-teach classes with their gender, ethnicity, English language learner and socioeconomic status.

CHAPTER III

METHODOLOGY

This chapter is a description of the quantitative design used in the current study. A description of the population, the procedures used to conduct the study, the research questions, the research design, the procedures and instruments, the data collection tools, the limitations, the human participants and ethics precautions, and a summary are discussed.

Introduction

The aim of educational research is to develop new learning about educational phenomena (Borg & Gall, 1989). Even further, the purpose is to build confidence that certain claims about the educational phenomena being studied were true or false. In the case of quantitative research, the goal is to gather data that prove or disprove the knowledge claim (Borg & Gall, 1989).

Quantitative research in education can be categorized as one of two types: descriptive studies and studies intended to discover causal relationships (Borg & Gall, 1989). Descriptive studies deal with finding out “what is,” and the causal-comparative method “is aimed at the discovery of possible causes for the phenomena being studied by comparing subjects in whom a characteristic is present with similar subjects in whom it is absent or present to a lesser degree” (p. 331). This research was a descriptive study.

The purpose of this study was to compare the student achievement of general education students in regular education classes with the student achievement of general education students in co-teach classes, as measured by the Texas Assessment of Knowledge and Skills (TAKS). Additionally, the study investigated if there is a relationship between the content of a co-teach class and the student achievement of general education students in regular education classes with the student achievement of general education students in co-teach classes, as measured by the Texas Assessment of Knowledge and Skills. The student achievement as measured by Texas Assessment of Knowledge and Skills of students by gender, ethnicity, English language learner status, and socioeconomic status of general education students in both co-teach and regular education classes was examined.

Population

The population was selected from an urban school district with an enrollment over 55,000 students that included six comprehensive high schools composed of grades 9-12, thirteen middle schools composed of grades 6-8, and 45 elementary schools composed of grades K-5. The ethnicity of the students in the school system is approximately 39.3% white, 9.3% African-American, 47.7% Hispanic, .3% American Indian, and 3.7% Asian. There are 39.1% students in the district on free/reduced lunch status. The participants in this study were classified as tenth grade high school students without disabilities in a regular education science or social studies class or general education students in a co-teach science or social studies class. The science classes included biology, integrated physics and chemistry, and chemistry classes.

The social studies classes included world geography, world history, and United States history.

While the school system chosen for study was partly contingent upon available access to the researcher, who resides in the county in which the school system is located, this school system is also one of the two largest districts in the state rated Recognized. Therefore, academic achievement results from the selected district might well be considered optimal for the studied instructional arrangements. The achievements of general education students taught in co-teach classes were also of interest to the school district. In this time of state and federal accountability, student achievement of all students is a matter of the highest interest to every district.

Procedures

Permission and support from the director of Research and Information Technologies in the school district, was attained prior to undertaking this study. The researcher contacted the principals of the high schools to explain the purpose of the study. The researcher gathered the demographic data directly from school officials, school records, and school staff, without contact with students. This research study was conducted using student records from school year 2006-2007. The researcher also utilized TAKS records from Texas Education Agency from the school year 2006-2007. This study followed the eight basic steps described by Gall, Borg, and Gall (1996).

Research Questions

The following research questions addressed were:

1. Do general education students in science co-teach classes demonstrate higher achievement than general education students in science regular education classes?
2. Do general education students in social studies co-teach classes demonstrate higher achievement than general education students in social studies regular education classes?
3. Do the gender, ethnicity, English language learner status, and socioeconomic status of general education students in co-teach classes impact the student achievement of those students compared to general education students in regular education classes?

Research Design

Statistical investigations of the relationship between the factors that include general education students, general education class, co-teach class, and TAKS results were conducted. For the purpose of this study, student achievement was measured by the scaled score of the Grade 10 TAKS science test and the scaled score of the Grade 10 TAKS social studies test. The group in this study was the total population of general education students who were enrolled in regular education science and co-teach science classes and regular education social studies and co-teach social studies classes. This descriptive, experimental study was limited to students in an urban school district.

Procedures and Instruments

The statistical procedures utilized in this study were descriptive statistics. Descriptive statistics were used to summarize and organize the data (Gall et al., 1996). Descriptive statistics were concerned primarily with reporting the condition of existing phenomenon and were used to reduce and organize the student data. Quantitative data were analyzed using Statistical Package for Social Studies (SPSS). For the interpretation of the data, descriptive and inferential data analysis was used.

The researcher used the *t-test for two independent samples* using the independent measures design for between subjects (Gravetter & Wallnau, 2005). This independent-measures hypothesis test enables the researcher to “evaluate the mean difference between two populations using the data from two separate samples” (Gravetter & Wallnau, 2005, p. 121). In addition, this hypothesis test will provide a uniform, formal procedure in order to establish whether the mean difference in this study is significantly greater than can be explained by sampling error (Gravetter & Wallnau, 2005).

Descriptive statistics are the most appropriate for comparing the outcomes for both the experimental and comparison group. The *t-test for two independent samples* was used to determine the statistical difference of the mean science scores and the mean social studies scores on the Texas Assessment of Knowledge and Skills concerning student achievement in science and social studies for the treatment group and the comparison group. An alpha level of .05 was used on all tests. From this

information the researcher provided inferential statistics in order to reach a conclusion about the entire population (Trochim, 2002).

Appropriate measures of central tendency and variance were used to report results of the data analyses. The researcher used the procedure known as the *Analysis of Variance* or *ANOVA* to test the hypotheses concerning means when there are several populations. ANOVA is a general technique that can be used to test the hypothesis that the means among two or more groups are equal, under the assumption that the sampled populations are normally distributed. Two way ANOVA was used to determine if significant difference exists among the independent variables, such as gender, ethnicity, English language learner status, and socioeconomic status of the different subgroups within the study. Post-hoc analyses of the impact of demographic information were completed. Multiple displays such as charts and tables were used to present findings and are found in Chapter IV.

Data Collection Tools

The researcher gathered the demographic data directly from school officials without contact with students. All demographic information arrived pre-coded on testing materials for Texas Essential Knowledge and Skills (TEA, 2007c). The Texas Education Agency (TEA) used the mandates of the Texas Education Code to collect data through the Public Information Management System (PEIMS). Data from PEIMS are used to script and track persons in the education system. Codes and verification are checked three times a year for student changes to data by the school administration, typically school counselors (TEA, 2007c). Tracking and coding of

each student in the Texas Education System offers TEA the ability to have TAKS examination booklets for Texas Essential Knowledge and Skills (TEKS) pre-coded for each student. Codes are generated by PEIMS and submitted to the test manufacturer. Schools can obtain testing booklets that are not pre-coded. In this event, school administration is responsible for verification of all data scribed on examination books. “In compliance with the Texas Education Code, the Public Education Information Management System (PEIMS) contains only the data necessary for the legislature and the Texas Education Agency (TEA) to perform their legally authorized functions in overseeing public education. It does not contain any information relating to instructional method, except as required by federal law” [Public Education Information Management System (PEIMS), 2007]. The researcher used these data from PEIMS in the study to obtain the TAKS scores and demographic information on the students.

Limitations

The following limitations of this study will necessitate caution in the interpretation of the results and restrict the ability to generalize the findings.

1. The population was limited to students in similar settings and learning conditions in an urban school district. The sample of student subjects within the school system significantly limits the ability to generalize the findings and may not be applicable to smaller rural districts or geographic regions.

2. The variation in how co-teaching models are implemented may affect the results with respect to the variability of student achievement and ability to generalize.
3. The sample of each of the student groups compared was obtained from actual students attending respective group settings in a district where inclusion has been a major initiative.

Human Participants and Ethics Precautions

Data utilized within this study were retrieved through pre-existing documentation. The data collected were available for public review, such as number of students receiving general education by grade, students in co-teach classes, students in general education classes, English language learners, ethnicity, gender, and socioeconomic status. Student identity was coded and any identifiable information was deleted. Confidentiality was assured by excluding student names, preserving data in aggregate form. Procedures were also developed to conceal the identity of individual schools within the school system. The researcher abided by all federal, state, and local confidentiality guidelines and procedures as they relate to students with disabilities and the ethics governing research.

Summary

Quantitative analysis and program descriptions were presented within this study. The utilization of both types of analysis was intended to lend further validity to the findings of the study. The two populations were compared using t-test and analyses of

variance (ANOVA). Chapter IV contains the statistical results for the processes listed within the methodology.

CHAPTER IV

RESULTS

The purpose of this study was to evaluate the achievement of general education students in co-teach classes with general education students in regular education classes. First, the achievement was determined for both groups of students in two content areas, science and social studies. Second, the relationships were examined by engaging statistical controls for gender, English language learner status, socioeconomic status, and ethnicity, while controlling for all students with disabilities. Student academic performance was determined according to Grade 10 Texas Assessment of Knowledge and Skills (TAKS) science and social studies test scores for the 2006-2007 school years. The t-test for two independent samples was used to determine the statistical difference of the mean science and social studies scores on the Texas Assessment of Knowledge and Skills concerning student achievement in science and social studies for the treatment group and the comparison group. An alpha level of 0.05 was used on all tests. Two-way analysis of variance (ANOVA) procedures were conducted to determine the relationships between gender, English language learner status, socioeconomic status, and ethnicity of students, co-teach and non-co-teach classes, and academic performance. An alpha level of 0.05 was used on all tests. The Scheffé post-hoc analysis was applied alpha level of 0.05 when significance in the ANOVA was found.

Therefore, the study addressed the following research question: Do general education students in science co-teach classes demonstrate higher achievement than

general education students in regular education science classes? In order to address this research question, the study tested the following null hypothesis: There is no significant differences between the achievements of general education students in co-teach science classes and general education students in regular science classes.

The study also addressed the following research question: Do general education students in social studies co-teach classes demonstrate higher achievement than general education students in regular social studies classes? In order to address this research question, the study tested the following null hypothesis: There is no significant differences between the achievements of general education students in co-teach social studies classes and general education students in regular social studies classes.

In addition, the study addressed the final research question: Does the gender, English language learner status, socioeconomic status, and ethnicity of general education students in co-teach classes impact the achievement of those students compared to general education students in regular education classes? In order to address this final research question, the study tested the following null hypothesis: There is no significant difference within the selected demographic variables of gender, ethnicity, English language learner status, and socioeconomic status when comparing the achievement of general education students in co-teach classes and general education students in regular classes.

In this chapter, results are reported for the three research questions guiding this study of an urban school district. Performance of students within the two educational settings, co-teach classes and non-co-teach classes, on the Grade 10 science and

social studies TAKS were examined. In order to present the findings of this study in a logical sequence, this chapter is organized into the six sections of Variables Within the Study, Independent and Dependent Variables, Research Question #1, Research Question #2, Research Question #3, and Summary.

Variables within the Study

TAKS scores, student gender, English language learners status, socioeconomic status, and student ethnicity variables were addressed as quantitative variables for this study. The population utilized in this study included an urban school district of general education Grade 10 students who were scored on the TAKS science and social studies test administration. The source for these variables was provided by the Texas Education Agency. The variables under study are introduced and discussed in the analysis of each research question.

Independent and Dependent Variables

The following paragraph presents the baseline data used for all variables used in the study. Both the independent and dependent variables in the study are addressed.

TAKS Scores

The dependent variables used in this study were TAKS science and social studies test scale scores, both of which measure student achievement. At the time of the study, TAKS was the primary state assessment for academic skills. TAKS purpose was to measure performance in the core areas of the state-mandated curriculum

(TEA, 2007c). The results are used to rate individual campuses and districts as academically unacceptable, acceptable, recognized, or exemplary. The TAKS science test was an examination measuring student's knowledge of the Texas Essential Knowledge and Skills science curriculum across the state (TEA, 2007a). The TAKS social studies was an examination measuring student's knowledge of the Texas Essential Knowledge and Skills social studies curriculum across the state (TEA, 2007b).

Gender

The gender status of the student was a categorical variable analyzed in this study. Students were identified as either male or female according to the designation retrieved from the demographic information from the PEIMS data.

English Language Learner Status

English language learner status was a categorical variable analyzed in this study. Students identified as English language learners in this study were students who met the criteria according to TEA to be qualified as secondary English language learners in Texas. The student's score on the English oral language proficiency test was below the level designated for indicating limited English proficiency. The student's score on the reading and language arts sections of the TEA-approved norm-referenced measure at his or her grade level was below the 40th percentile and/or the student's ability in English was so limited that the administration, at his or her grade level, of the reading

and language arts sections of a TEA-approved norm-referenced assessment instrument or other test approved by TEA was not valid (TEA, 2007c).

Socioeconomic Status

Socioeconomic status was a dichotomous categorical variable analyzed in this study. Students identified as socioeconomic status (SES) were students eligible for free or reduced meals based on a sliding scale of the total household and the household size (Food and Nutrition Service, 2007).

Student Ethnicity

Student ethnicity was a categorical variable used in this study. All student data retrieved from the Texas Education Agency were analyzed according to White, African-American, Hispanic, Native-American, and Asian ethnic groups. Because of enrollments, only White, African-American, Hispanic and Asian/Pacific Islander students were used in the analyses.

Research Question 1

The first research question investigated was whether general education students in science co-teach classes demonstrate higher achievement than general education students in regular education science classes. In order to address this research question, the study tested the following null hypothesis: There are no significant differences between the achievements of general education students in co-teach science classes and general education students in regular science classes. The null hypothesis

investigating the achievements of general education students in co-teach science classes and general education students in regular science classes was analyzed using an independent samples t-test. Table 1 is a report of the descriptive statistics for the two groups.

TABLE 1. Number, Mean, and Standard Deviation for the Science Scale Scores of Students Organized by Their Co-teach Status

Co-teach Status	Number	Mean	Std. Deviation
Not in Co-teach	3529	2197.54	150.141
In Co-teach Class	852	2156.99	149.105

Table 2 is a representation of the data for the independent samples t-test. The level of significance for the procedure was 0.001. This was less than the alpha level of 0.05. As a result, the decision was made to reject the null hypotheses of no difference. Therefore, it was inferred that the means in the population, from which these samples means were drawn, were different. That is, there was a statistical difference between the population means. General education students in science co-teach classes demonstrated lower achievement than general education students in regular science classes.

TABLE 2. Independent Samples *t*-test for Science Scale Score, by Co-teach Status with Equal Variances Assumed

t score	Degrees of Freedom	Significance
7.084	4379	0.001*

* Significant < 0.05

Research Question 2

The second research question investigated whether general education students in social studies co-teach classes demonstrated higher achievement than general education students in regular education social studies classes. In order to address this research question, the study tested the following null hypothesis: There is no significant differences between the achievements of general education students in co-teach social studies classes and general education students in regular social studies classes. The achievements of general education students in co-teach social studies classes and general education students in regular social studies classes was analyzed using an independent samples *t*-test. Table 3 is a representation of the descriptive statistics for the two groups.

TABLE 3. The Number, Mean, and Standard Deviation of the Social Studies Scaled Scores of Students Organized by Their Co-teach Status of Students

Co-teach Status	Number	Mean	Std. Deviation
Not in Co-teach	3515	2353.98	159.623
In Co-teach Class	847	2322.04	160.460

Table 4 is a representation of the data for the independent samples t-test. The level of significance for the procedure was 0.001. This was less than the alpha level of 0.05. As a result, the decision was made to reject the null hypotheses of no difference. Therefore, it was inferred that the means in the population, from which these samples were drawn, were different. There was a statistical difference between the population means. General education students in social studies co-teach classes demonstrated lower achievement than general education students in regular social studies classes.

TABLE 4. Independent Samples *t*-test for Social Studies Scale Score, by Co-teach Status with Equal Variances Assumed

t Score	Degrees of Freedom	Significance
5.221	4360	0.001*

* Significant < 0.05

Research Question 3

The third research question investigated whether the gender, English language learner status, socioeconomic status, and ethnicity of general education students in co-teach classes was higher than the achievement of those same categories of students in regular education classes. Both subjects of science and social studies were analyzed according to Grade 10 TAKS scores. In order to address this final research question, the study tested the following null hypothesis: There is no significant difference within the selected demographic variables of gender, English language

learner status, socioeconomic status, and ethnicity of general education students when comparing their achievements in co-teach classes and in regular classes. Each of those categories of students was analyzed separately using a two-way ANOVA. The Scheffé test was further applied for post hoc analysis for the ethnicity of the students. The analyses of the categories follow.

Gender Status of Students

In order to investigate the category of gender in this study, the third research question was reworded into the following null hypothesis: There is no impact on the achievement of a student based on his/her status in a co-teach class and/or the gender of the student. The null hypothesis was analyzed using a two-way ANOVA. The data for science are listed first followed by the data for social studies. The descriptive statistics used by this analysis for science are presented in Table 5. It is followed by Table 6 in which the two-way ANOVA results for science are arrayed. The descriptive statistics used by this analysis for social studies are presented in Table 7. It is followed by Table 8 in which the two-way ANOVA results for social studies are displayed.

TABLE 5. The Number, Mean, and Standard Deviation of Student Science Scale Scores Organized by the Gender of the Students

Co-teach Status	Number	Mean	Std. Deviation
Not in Co-teach			
Female	1847	2179.24	143.22
Male	1682	2217.62	154.963
Total	3529	2197.54	150.141
In Co-teach Class			
Female	442	2134.73	133.407
Male	410	2180.99	161.107
Total	852	2156.99	149.105
Total			
Female	2289	2170.65	142.440
Male	2092	2210.44	156.823
Total	4381	2189.65	150.780

Table 6 is a representation of the three elements that are compared in the two-way ANOVA—the impact of co-teach status, the impact of gender, and the interaction of the two. Each of the three components will be examined in turn.

TABLE 6. Two-way ANOVA Results for Science Scale Scores of Students Organized by Gender

Source	df	Mean Square	F	Sig.
Co-teach	1	1128062.944	51.062	.001
Gender	1	1227211.093	55.550	.001
Co-teach by gender	1	10649.676	.482	.488

The p-value obtained from the procedure relating to co-teach status was 0.001. This was less than the alpha level of 0.05. Therefore, the decision was made to reject the null hypothesis of no difference attributed to co-teach status. It was consequently

inferred that, in the population from which this sample was drawn, the means of the two groups are not the same. One group has a statistically higher score than the other. Students who were enrolled in the regular science classes outperformed those students who were enrolled in the co-teach science classes. This had been demonstrated in Research Question 1.

The p-value obtained from the procedure relating to gender was 0.001. This was less than the alpha level of 0.05. Therefore, the decision was made to reject the null hypothesis of no difference attributed to gender. It was consequently inferred that, in the population from which this sample was drawn, the means of the two groups are not the same. One group has a statistically higher score than the other. Boys and girls did not score the same on the Grade 10 TAKS science test. Boys outperformed girls.

The p-value obtained from the procedure relating to the interaction between co-teach status and gender was 0.488. This was greater than the alpha level of 0.05. Therefore, the decision was made to fail to reject the null hypothesis of no difference attributed to the interaction between co-teach status and gender. It was consequently inferred that, in the population from which this sample was drawn, the means of the two genders across the two co-teach status options maintained the same relative position. Boys and girls scored at the relative position irrespective of co-teach status on the Grade 10 TAKS science test.

TABLE 7. Number, Mean, and Standard Deviation of Student Social Studies Scale Scores Organized by Gender and Co-teach Status

Co-teach Status	Number	Mean	Std. Deviation
Not in Co-teach			
Female	1842	2332.41	149.648
Male	1673	2377.73	166.777
Total	3515	2353.98	159.623
In Co-teach Class			
Female	438	2300.18	147.786
Male	409	2345.46	170.093
Total	847	2322.04	160.460
Total			
Female	2280	2326.22	149.799
Male	2082	2371.39	167.883
Total	4362	2347.78	160.266

Table 8 is a representation of the three elements that are compared in the two-way ANOVA—the impact of co-teach status, the impact of gender, and the interaction of the two. Each of the three components will be examined in turn.

TABLE 8. Two-way ANOVA Results for Social Studies Scale Scores of Students Organized by Gender

Source	df	Mean Square	F	Sig.
Co-teach	1	708834.386	28.319	.001
Gender	1	1398728.998	55.881	.001
Co-teach by Gender	1	.148	.000	.998

The p-value obtained from the procedure relating to co-teach status was 0.001. This was less than the alpha level of 0.05. Therefore, the decision was made to reject

the null hypothesis of no difference attributed to co-teach status. It was consequently inferred that, in the population from which this sample was drawn, the means of the two groups are not the same. One group has a statistically higher score than the other. Students who were enrolled in the regular social studies classes outperformed those students who were enrolled in the co-teach social studies classes.

The p-value obtained from the procedure relating to gender was 0.001. This was less than the alpha level of 0.05. Therefore, the decision was made to reject the null hypothesis of no difference attributed to gender. It was consequently inferred that, in the population from which this sample was drawn, the means of the two groups are not the same. One group has a statistically higher score than the other. Boys and girls did not score the same on the Grade 10 TAKS social studies test.

The p-value obtained from the procedure relating to the interaction between co-teach status and gender was 0.998. This was greater than the alpha level of 0.05. Therefore, the decision was made to fail to reject the null hypothesis of no difference attributed to the interaction between co-teach status and gender. It was consequently inferred that, in the population from which this sample was drawn, the means of the two genders across the two co-teach status options maintained the same relative position. Each group has statistically the same relative score location than the other within the two co-teaches categories. Boys and girls scored in the same relative position irrespective of co-teach status on the Grade 10 TAKS social studies test.

English Language Learner Status of Students

In order to investigate the category of English language learner status in this study, the third research question was reworded into the following null hypothesis: There is no impact on the achievement of a student based on his/her status in a co-teach class and/or the English language learner status of the student. The null hypothesis was analyzed using a two-way ANOVA. The data for science are listed first followed by the data for social studies. The descriptive statistics used by this analysis for science are presented in Table 9. It is followed by Table 10 that provides the two-way ANOVA results for science. The descriptive statistics used by this analysis for social studies are presented in Table 11. It is followed by Table 12 that provides the two-way ANOVA results for social studies.

TABLE 9. Number, Mean, and Standard Deviation of Student Science Scale Scores Organized by ELL and Co-teach Status

Co-teach Status	ELL Status	Number	Mean	Std. Deviation
Not in Co-teach	Not ELL	3482	2198.88	150.094
	Current ELL	47	2097.72	117.428
	Total	3529	2197.54	150.141
In Co-teach Class	Not ELL	837	2158.85	148.794
	Current ELL	15	2053.13	132.654
	Total	852	2156.99	149.105
Total	Not ELL	4319	2191.13	150.659
	Current ELL	62	2086.94	121.687
	Total	4381	2189.65	150.780

Table 10 is a presentation of the three elements that are compared in the two-way ANOVA—the impact of co-teach status, the impact of ELL status, and the interaction of the two. Each of the three components will be examined, in turn.

TABLE 10. Two-way ANOVA Results for Science Scale Scores of Students Organized by ELL Status

Source	df	Mean Square	F	Sig.
Co-teach	1	80076.072	3.583	.058
ELL Status	1	478597.994	21.417	.001
Co-teach by ELL Status	1	232.374	.010	.919

The p-value obtained from the procedure relating to co-teach status was 0.058. This was greater than the alpha level of 0.05. Therefore, the decision was made to fail to reject the null hypothesis of no difference attributed to co-teach status. It was consequently inferred that, in the population from which this sample was drawn, the means of the two groups are the same. One group has statistically the same score than the other. ELL students who were enrolled in the regular science classes scored the same as ELL students who were enrolled in the co-teach science classes on the Grade 10 TAKS science test.

The p-value obtained from the procedure relating to ELL status was 0.001. This was less than the alpha level of 0.05. Therefore, the decision was made to reject the null hypothesis of no difference attributed to ELL status. It was consequently inferred that, in the population from which this sample was drawn, the means of the two groups are not the same. One group has a statistically higher score than the other.

ELL students did not score the same on the Grade 10 TAKS science test. ELL students scored significantly lower on the science test than their non-ELL counterparts.

The p-value obtained from the procedure relating to the interaction between co-teach status and ELL status was 0.919. This was greater than the alpha level of 0.05. Therefore, the decision was made to fail to reject the null hypothesis of no difference attributed to the interaction between co-teach status and ELL status. It was consequently inferred that, in the population from which this sample was drawn, the means of the two ELL status student groups across the two co-teach status options maintained the same relative position. Each group had statistically the same score location than the other within the two co-teaches settings. ELL students under-scored the non-ELL students irrespective of co-teach status on the Grade 10 TAKS science test.

TABLE 11. Number, Mean, and Standard Deviation of Student Social Studies Scale Scores Organized by ELL Status of the Students

Co-teach Status	ELL Status	Number	Mean	Std. Deviation
Not in Co-teach	Not ELL	3470	2355.97	158.996
	Current ELL	45	2200.64	132.046
	Total	3515	2353.98	159.623
In Co-teach Class	Not ELL	832	2325.05	159.521
	Current ELL	15	2155.13	122.591
	Total	847	2322.04	160.460
Total	Not ELL	4302	2349.99	159.547
	Current ELL	60	2189.27	130.247
	Total	4362	2347.78	160.266

Table 12 is a presentation of the three elements that are compared in the two-way ANOVA—the impact of co-teach status, the impact of ELL status, and the interaction of the two. Each of the three components will be examined, in turn.

TABLE 12. Two-way ANOVA Results for Social Studies Scale Scores of Students Organized by ELL Status

Source	df	Mean Square	F	Sig.
Co-teach	1	64625.564	2.565	.109
ELL	1	1170430.525	46.446	.001
Co-teach by ELL Status	1	2357.588	.094	.760

The p-value obtained from the procedure relating to co-teach status was 0.109. This was greater than the alpha level of 0.05. Therefore, the decision was made to fail to reject the null hypothesis of no difference attributed to co-teach status. It was consequently inferred that, in the population from which this sample was drawn, the means of the two groups are the same. One group has statistically the same score than the other. ELL students who were enrolled in the regular social studies classes scored the same as ELL students who were enrolled in the co-teach social studies classes on the Grade 10 TAKS social studies test.

The p-value obtained from the procedure relating to ELL status was 0.001. This was less than the alpha level of 0.05. Therefore, the decision was made to reject the null hypothesis of no difference attributed to ELL status. It was consequently inferred that, in the population from which this sample was drawn, the means of the two groups are not the same. One group has a statistically higher score than the other.

ELL students did not score the same on the Grade 10 TAKS social studies test. ELL students' scores were significantly lower than their non-ELL peers in social studies.

The p-value obtained from the procedure relating to the interaction between co-teaches status and ELL status was 0.760. This was greater than the alpha level of 0.05. Therefore, the decision was made to fail to reject the null hypothesis of no difference attributed to the interaction between co-teach status and ELL status. It was consequently inferred that, in the population from which this sample was drawn, the means of the two ELL status student groups across the two co-teach status options held the same relative position. Each group has statistically the same score than the other within the two co-teaches settings. ELL students scored in the same relative position irrespective of co-teach status on the Grade 10 TAKS social studies test.

Economic Disadvantaged Status of Students

In order to investigate the category of economic disadvantaged status (EDS) in this study, the third research question was reworded into the following null hypothesis: There is no impact on the achievement of a student based on his/her status in a co-teach class and/or the economic disadvantaged status of the student. The null hypothesis was analyzed using a two-way ANOVA. The data for science are listed first followed by the data for social studies. The descriptive statistics used by this analysis for science are presented in Table 13. It is followed by Table 14 that provides the two-way ANOVA results for science. The descriptive statistics used by this analysis for social studies are presented in Table 15. It is followed by Table 16 that provides the two-way ANOVA results for social studies.

TABLE 13. Number, Mean, and Standard Deviation of Student Science Scale Scores Organized by the Economic Disadvantaged Status of the Students

Co-teach Status	EDS Status	Number	Mean	Std. Deviation
Not in Co-teach	Not EDS	2777	2215.55	147.424
	EDS	749	2130.38	140.959
	Total	3526	2197.46	150.153
In Co-teach Class	Not EDS	602	2181.16	152.162
	EDS	250	2098.80	123.641
	Total	852	2156.99	149.105
Total	Not EDS	3379	2209.42	148.839
	EDS	999	2122.48	137.453
	Total	4378	2189.58	150.786

Table 14 is a presentation of the three elements that are compared in the two-way ANOVA—the impact of co-teach status, the impact of economic disadvantaged status, and the interaction of the two. Each of the three components will be examined, in turn.

TABLE 14. Two-way ANOVA Results for Science Scale Scores of Students Organized by Economic Disadvantaged Status

Source	df	Mean Square	F	Sig.
Co-teach	1	591690.778	27.853	.001
Economically Disadvantaged	1	3814953.360	179.587	.001
Co-teach by Economic Disadvantage	1	1074.263	.051	.822

The p-value obtained from the procedure relating to co-teach status was 0.001. This was less than the alpha level of 0.05. Therefore, the decision was made to reject the null hypothesis of no difference attributed to co-teach status. It was consequently inferred that, in the population from which this sample was drawn, the means of the two groups were not the same. One group has a statistically higher score than the other. Students who were not in the co-teach classes outperformed those students who were enrolled in the co-teach science classes.

The p-value obtained from the procedure relating to economical disadvantaged status was 0.001. This was less than the alpha level of 0.05. Therefore, the decision was made to reject the null hypothesis of no difference attributed to economical disadvantaged status. It was consequently inferred that, in the population from which this sample was drawn, the means of the two groups are not the same. One group has a statistically higher score than the other. Economic disadvantaged students statistically underperformed their non-economically disadvantaged peers on the Grade 10 TAKS science test.

The p-value obtained from the procedure relating to the interaction between co-teaches status and economic disadvantaged status was 0.822. This was greater than the alpha level of 0.05. Therefore, the decision was made to fail to reject the null hypothesis of no difference attributed to the interaction between co-teach status and economic disadvantage status. It was consequently inferred that, in the population from which this sample was drawn, the means of the two economic disadvantaged status student groups across the two co-teach status options held the same relative position. Each group has statistically the same location than the other within the two

co-teaches settings. Economic disadvantaged students scored the same—scoring below the non-economically disabled—irrespective of co-teach status on the Grade 10 TAKS science test.

TABLE 15. Number, Mean, and Standard Deviation of Student Social Studies Scale Scores Organized by Economic Disadvantaged and Co-teach Status

Co-teach Status	EDS Status	Number	Mean	Std. Deviation
Not in Co-teach	Not EDS	2764	2373.17	155.316
	EDS	748	2283.30	155.547
	Total	3512	2354.03	159.642
In Co-teach Class	Not EDS	597	2346.96	159.551
	EDS	250	2262.54	146.643
	Total	847	2322.04	160.460
Total	Not EDS	3361	2368.51	156.374
	EDS	998	2278.10	153.556
	Total	4359	2347.81	160.283

Table 16 is a representation of the three elements that are compared in the two-way ANOVA—the impact of co-teach status, the impact of economic disadvantaged status, and the interaction of the two. Each of the three components will be examined in turn.

TABLE 16. Two-way ANOVA Results for Social Studies Scale Scores of Students Organized by Economic Disadvantaged Status

Source	df	Mean Square	F	Sig.
Co-teach	1	299154.067	12.378	.001
Economically Disadvantaged	1	4119124.886	170.436	.001
Co-teach by Economically Disadvantaged	1	4025.007	.167	.683

The p-value obtained from the procedure relating to co-teach status was 0.001. This was less than the alpha level of 0.05. Therefore, the decision was made to reject the null hypothesis of no difference attributed to co-teach status. It was consequently inferred that, in the population from which this sample was drawn, the means of the two groups are not the same. One group has a statistically higher score than the other. Students in the non-co-teach classes statistically outperformed those students who were enrolled in the co-teach social studies classes.

The p-value obtained from the procedure relating to economical disadvantaged status was 0.001. This was less than the alpha level of 0.05. Therefore, the decision was made to reject the null hypothesis of no difference attributed to economical disadvantaged status. It was consequently inferred that, in the population from which this sample was drawn, the means of the two groups were not the same. One group had a statistically higher score than the other. Economic disadvantaged students did not score as well as the non-economically disadvantaged students on the Grade 10 TAKS social studies test.

The p-value obtained from the procedure relating to the interaction between co-teaches status and economic disadvantaged status was 0.683. This was greater than

the alpha level of 0.05. Therefore, the decision was made to fail to reject the null hypothesis of no difference attributed to the interaction between co-teach status and economic disadvantage status. It was consequently inferred that, in the population from which this sample was drawn, the means of the two economic disadvantaged status student groups across the two co-teach status options maintained their same relative position. Each economically disadvantaged group had statistically the same relative score than the other within the two co-teaches settings. Economic disadvantaged students and non-economically disadvantaged students scored the same irrespective of co-teach status on the Grade 10 TAKS social studies test.

Ethnicity Status of Students

In order to investigate the category of ethnicity in this study, the third research question was reworded into the following null hypothesis: There is no impact on the achievement of a student based on his/her status in a co-teach class and/or the ethnicity of the student. The null hypothesis was analyzed using a two-way ANOVA. When statistically significant findings were found, a Scheffé post hoc analysis was conducted. The data for science are listed first followed by the data for social studies. The descriptive statistics used by this analysis for science are presented in Table 17. It is followed by Table 18 which a representation of the two-way ANOVA results for science. Table 19 is a display of the results on the post hoc analysis for science. The descriptive statistics used by this analysis for social studies are presented in Table 20. It is followed by Table 21 that is a display of the two-way ANOVA results for social studies. Table 22 is a representation results for the post hoc analysis for social studies.

TABLE 17. Number, Mean, and Standard Deviation of Student Science Scale Scores Organized by the Ethnicity of the Students

Co-teach Status	Ethnicity	Number	Mean	Std. Deviation
Not in Co-teach	Asian/PI	136	2204.85	144.179
	AfrAmer	354	2133.22	122.000
	Hispanic	1314	2159.44	142.625
	White	1720	2239.13	149.398
	Total	3524	2197.45	150.211
In Co-teach Class	Asian/PI	31	2159.42	187.242
	AfrAmer	100	2096.18	116.654
	Hispanic	367	2117.68	138.082
	White	353	2214.53	145.206
	Total	851	2156.85	149.134
Total	Asian/PI	167	2196.42	153.478
	AfrAmer	454	2125.06	121.690
	Hispanic	1681	2150.32	142.653
	White	2073	2234.94	148.945
	Total	4375	2189.55	150.844

Table 18 is a presentation of the three elements that are compared in the two-way ANOVA—the impact of co-teach status, the impact of ethnicity status, and the interaction of the two. Each of the three components will be examined in turn.

TABLE 18. Two-way ANOVA Results for Science Scale Scores Organized by Ethnicity

Source	df	Mean Square	F	Sig.
Co-teach	1	373305.823	18.126	.001
Ethnicity	3	1936508.765	94.030	.001
Co-teach by Ethnicity	3	15720.518	.763	.515

The p-value obtained from the procedure relating to co-teach status was 0.001. This was less than the alpha level of 0.05. Therefore, the decision was made to reject the null hypothesis of no difference attributed to co-teach status. It was consequently inferred that, in the population from which this sample was drawn, the means of the two groups are not the same. One group has a statistically higher score than the other. Students in the regular science classes outperformed the students as a whole in the co-teach science classes.

The p-value obtained from the procedure relating to ethnicity status was 0.001. This was less than the alpha level of 0.05. Therefore, the decision was made to reject the null hypothesis of no difference attributed to ethnicity status. It was consequently inferred that, in the population from which this sample was drawn, at least one of the means was not the same as at least one other group mean. One group has a statistically higher score than the other. The mean scores of the differing ethnic groups were not the same on the Grade 10 TAKS science test. To determine where the differences occurred, a Scheffé post hoc analysis was run.

The post hoc analysis for data shown in Table 19 revealed a significant difference between ethnic groups. There was no significant difference on the mean scores of

African Americans and Hispanics on the Grade 10 TAKS science test. African Americans and Hispanics had the lowest mean scores on the Grade 10 TAKS science test. They scored the same but lower than Asian/Pacific Islanders and lower than Whites. The Asian/Pacific Islander ethnic group had a mean score on the Grade 10 TAKS science test which was between the Whites and the African American/Hispanics ethnic groups. There was a significant difference between the White ethnicity group and the other groups. Whites were highest on the Grade 10 TAKS science test. Whites scored significantly higher on the Grade 10 TAKS science test than all the other ethnic groups that were investigated in this study.

TABLE 19. Number and Mean of Student Science Scale Scores Organized by Ethnicity Groups of the Students

Ethnic Groups	Number	Mean
Afr Amer	454	2125.06
Hispanic	1681	2150.32
Asian/PI	167	2196.42
White	2073	2234.94

The p-value obtained from the procedure relating to the interaction between co-teaches status and ethnicity status was 0.515. This was greater than the alpha level of 0.05. Therefore, the decision was made to fail to reject the null hypothesis of no difference attributed to the interaction between co-teach status and ethnicity status. It was consequently inferred that, in the population from which this sample was drawn, the means of the four ethnicity status groups across the two co-teach status options

remained in the same relative position. Each group has statistically the same score within the two co-teaches settings. Ethnic students scored in the same relative order irrespective of co-teach status on the Grade 10 TAKS science test.

TABLE 20. Number, Mean, and Standard Deviation of Student Social Studies Scale Scores Organized by the Ethnicity of the Students

Co-teach Status	Ethnicity	Number	Mean	Std. Deviation
Not in Co-teach	Asian/PI	136	2354.94	180.853
	AfrAmer	358	2292.49	135.963
	Hispanic	1309	2316.75	154.142
	White	1707	2395.20	155.641
	Total	3510	2353.91	159.695
In Co-teach Class	Asian/PI	31	2303.35	169.950
	AfrAmer	99	2279.45	139.107
	Hispanic	363	2280.67	152.308
	White	353	2377.89	157.202
	Total	846	2321.92	160.517
Total	Asian/PI	167	2345.37	179.511
	AfrAmer	457	2289.66	136.602
	Hispanic	1672	2308.91	154.419
	White	2060	2392.24	156.008
	Total	4356	2347.70	160.337

Table 21 is a presentation of the three elements that are compared in the two-way ANOVA—the impact of co-teach status, the impact of ethnicity status, and the interaction of the two. Each of the three components will be examined, in turn.

TABLE 21. Two-way ANOVA Results for Social Studies Scale Scores Organized by Ethnicity

Source	df	Mean Square	F	Sig.
Co-teach	1	234271.799	9.863	.002
Ethnicity	3	1783840.346	75.099	.001
Co-teach by Ethnicity	3	26846.693	1.130	.335

The p-value obtained from the procedure relating to co-teach status was 0.002. This was less than the alpha level of 0.05. Therefore, the decision was made to reject the null hypothesis of no difference attributed to co-teach status. It was consequently inferred that, in the population from which this sample was drawn, the means of the two groups are not the same. One group has a statistically higher score than the other. Students as a whole in the regular social studies classes outperformed the students as a whole in the co-teach social studies classes.

The p-value obtained from the procedure relating to ethnicity status was 0.001. This was less than the alpha level of 0.05. Therefore, the decision was made to reject the null hypothesis of no difference attributed to ethnicity status. It was consequently inferred that, in the population from which this sample was drawn, the means of the four groups are not the same. At least one group has a statistically higher score than at least one other. Ethnic students did not score the same on the Grade 10 TAKS social studies test.

The post hoc analysis for data shown in Table 22 revealed a significant difference between the ethnic groups. There was no significant difference on the mean scores of African Americans and Hispanics on the Grade 10 TAKS social studies tests. African American students and Hispanic students scored lower than the other two ethnic

groups. Asian/Pacific Islander ethnic group had a mean score on the Grade 10 TAKS social studies test which was between the Whites and the African American/Hispanics ethnic groups. There was a significant difference between the White ethnicity group and the other groups. Whites were highest on the Grade 10 TAKS social studies test. Whites scored significantly higher on the Grade 10 TAKS social studies test than all the other ethnic groups that were investigated in this study.

TABLE 22. Number and Mean of Student Social Studies Scale Scores Organized by Ethnicity Groups of the Students

Ethnic Groups	Number	Mean
Afr Amer	467	2289.66
Hispanic	1672	2308.91
Asian/PI	167	2345.37
White	2060	2392.24

The p-value obtained from the procedure relating to the interaction between co-teaches status and ethnicity status was 0.335. This was greater than the alpha level of 0.05. Therefore, the decision was made to fail to reject the null hypothesis of no difference attributed to the interaction between co-teach status and ethnicity status. It was consequently inferred that, in the population from which this sample was drawn, the means of the four ethnic groups across the two co-teach status options were stable in their order. Each group had statistically the same position within the two co-teaches settings. Ethnic students scored at the same relative position irrespective of co-teach status on the Grade 10 TAKS social studies test.

Summary

Chapter IV was an analysis of the data collected for this study. Chapter V contains the summary of the purpose of the study, the discussion of the findings, conclusions, and further recommendations for study.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

One of the critical goals of No Child Left Behind (NCLB) federal legislation is to raise student achievement through accountability standards for *all* students. NCLB reinforces the proposition that *all* children have a right to a quality education. Inclusion of students at all levels is a challenge, one that has been intensified by the mandates of No Child Left Behind, and the Individuals with Disabilities Education Improvement Act of 2004 (IDEIA, 2004), the most recent reauthorization to IDEA.

Co-teaching is among the service delivery models implemented in the general education classroom in order to implement inclusion (Rea & Connell, 2005; Weiss & Lloyd, 2002). General education and special education teachers are charged with structuring the co-teach classroom around task-oriented goals that emphasize learning mastery. This means that they must provide positive reinforcement to all students for setting and achieving personal learning goals, with an emphasis on academic outcomes for *all* students, with and without disabilities. There must be positive outcomes for general education students in co-teach classes as well as for special education students.

The purpose of this study was to compare the achievement of general education students in general education classrooms to the achievement of general education students in co-teach classes to determine if there was a significant difference in the achievement of general education students because of participation in a co-teach

classroom instructional arrangement. The study examined the achievement of general education students in general education classrooms to the achievement of general education students in co-teach classrooms in the two content areas of science and social studies. In addition, the achievement of general education students in both general education classes and co-teach classes was examined by gender, ethnicity, English language learner status, and socioeconomic status. Results of this study indicate that general education students in science (Table 2) and social studies (Table 4) co-teach classes demonstrated lower achievement than general education students in regular education classes. The achievement of general education students in those co-teach classes, examined by gender in science (Table 6) and in social studies (Table 8), by English language learner status in science (Table 10) and in social studies (Table 12), by socioeconomic status in science (Table 14) and in social studies (Table 16), and by ethnicity in science (Table 18) and in social studies (Table 21), all scored the same irrespective of co-teach status on the Grade 10 TAKS science and social studies tests.

Presented in this chapter is a review of the statement of the problem, methodology and a discussion of the conclusions. Recommendations are made for additional research and the implications of these findings for stakeholders are provided.

Statement of the Problem

There was a large body of research on co-teaching and the academic outcomes for students with disabilities in co-teach classes (Bear & Proctor, 1990; Harris et al., 1987; Schulte et al., 1990). The areas investigated were generally elementary aged

students and a few studies of middle school aged students; however, no studies were located that investigated the impact of co-teach classes on the academic achievement of secondary general education students in those classes. There was, consequently, no research on the impact the co-teach class had on general education students in those classes and their student achievement in relation to their gender, ethnicity, English language learner status, and socioeconomic status. This research was designed to address these gaps in the literature.

Methodology

The primary focus of this quantitative study was to determine the relationship between general education students and co-teach classes. The statistical procedures utilized in this study were descriptive and inferential. Quantitative procedures rely on statistics to depict data trends in understandable and meaningful ways (Gall, Borg, & Gall, 1996). Descriptive statistics are the most appropriate for obtaining the outcomes of the experimental and comparison samples. Inferential statistics are the most appropriate for comparing the outcomes for both the experimental and comparison group and inferring a difference that would exist in the population from which the sample was drawn.

The *t-test for two independent samples* was used to determine the statistical difference of the mean science and social studies scores on the Texas Assessment of Knowledge and Skills concerning student achievement in science and social studies for the treatment group and the comparison group. An alpha level of .05 was used on

all tests. From this information the researcher provided inferential statistics in order to reach a conclusion about the entire population (Trochim, 2002).

Appropriate measures of central tendency and variance were used to report results of the data analyses. An analysis of variance (ANOVA) procedure is a general technique that can be used to test the hypothesis that the means among two or more groups are equal, under the assumption that the sampled populations are normally distributed. A two-way ANOVA was used to determine if significant difference exists among the independent variables, such as gender, ethnicity, English language learners, and socioeconomic status of the different subgroups within the study. Post-hoc analyses of the impact of demographic information were conducted where appropriate.

Conclusions

The goal of this research was to contribute to the understanding of issues related to the relationship between general education students and student achievement in co-teach classes through the analysis of mean scores earned by these students taking the science and social studies Texas Assessment of Knowledge and Skills (TAKS) tests. TAKS science and social studies scores for the 2006-2007 school year were retrieved from the Texas Education Agency (TEA), and the data were analyzed using the Statistical Package for Social Sciences (SPSS). The data revealed answers for each of the research questions. Each question's conclusion, along with a summary of the results, follows.

Question 1

The first research question was as follows: *Do general education students in science co-teach classes demonstrate higher achievement than general education students in regular education science classes?* The first research question was answered using descriptive statistics for general education students in regular science classes and in co-teach science classes taking the Grade 10 TAKS science test during the 2006-2007 school year. The t-test for two independent samples was used to determine the statistical difference of the mean science scaled score on the TAKS science test.

Statistically significant differences were observed among the general education students in the regular science classes, and practical significance was found. Based on the results found in Table 2, this researcher found that general education students in regular science classes demonstrated higher achievement than general education students in co-teach science classes. The researcher concluded, therefore, that general education students performed at higher levels in regular science classes than in co-teach science classes.

There are no directly comparable previous studies of general education students' TAKS achievement in science co-teach classes compared to that of general education students' TAKS achievement in general education science classes, and the findings of this study do not precisely parallel the results of those previous studies which are roughly related. In a quantitative study to assess whether co-teaching had the potential for improved course passing rates for all students, Haselden (2004) found no

statistically significant difference in passing rates among the full mix of students in four settings, including one co-taught class and two general education classes.

Question 2

The second research question was as follows: *Do general education students in social studies co-teach classes demonstrate higher achievement than general education students in regular education social studies classes?* The second research question was answered using descriptive statistics for general education students in regular social studies classes and in co-teach social studies classes taking the Grade 10 TAKS social studies test during the 2006-2007 school year. The t-test for two independent samples was used to determine the statistical difference of the mean social studies scaled score on the TAKS social studies test.

Statistically significant differences were observed among the general education students in the regular social studies classes, and practical significance was found. Based on the results found in Table 4, this researcher found that general education students in regular social studies classes demonstrated higher achievement than general education students in co-teach social studies classes. The researcher concluded, therefore, that general education students performed at higher levels in regular social studies classes than in co-teach social studies classes.

Once again, there is a lack of previous studies of general education students' TAKS achievement in social studies co-teach classes compared to general education students' TAKS achievement in general education social studies classes. And once again, the findings of this study are not parallel with the results of roughly related

previous studies. In a quantitative study to determine if individual needs of secondary students with disabilities were met in a co-teaching environment, Murawski (2006) found no significant differences in academic outcomes for reading and writing assessments for students with learning disabilities in the co-teaching environment as compared to students with disabilities in the mainstream class, in a pull-out class, or in a general education setting.

Question 3

The third research question was as follows: *Does the gender, ethnicity, English language learner status, and socioeconomic status of general education students in co-teach classes impact the student achievement of those students compared to general education students in regular education classes?* The third research question was answered using descriptive statistics by category of gender, ethnicity, English language learner status, and socioeconomic status of general education students in regular science and social studies classes and in co-teach science and social studies classes taking the Grade 10 TAKS science and social studies tests during the 2006-2007 school year. Each of these categories of students was analyzed separately using a two-way ANOVA. The Scheffé test was further applied for post hoc analysis for the ethnicity of the students.

Gender of the students. There were some statistically significant differences observed among the first category of students investigated on the Grade 10 science TAKS test. Based on the results found in Table 6, in relation to the regular science

classes or co-teach science classes, it was found that students in the regular science classes outperformed those students in the co-teach science classes. In relation to the gender of the student, it was found boys outperformed girls in both the regular science classes and the co-teach science classes. However, in respect to the correlation of academic achievement scores of general education students by gender with co-teach instructional arrangements and non-co-teach instructional arrangements, no statistically significant difference in Grade 10 TAKS science test was found.

There were also some statistically significant differences observed among the first category of students investigated on the Grade 10 TAKS social studies test. Based on the results found in Table 8, in relation to the regular social studies classes or co-teach social studies classes, it was found that students in the regular social studies classes outperformed those students in the co-teach social studies classes. In relation to the gender of the student, it was found boys outperformed girls in both the regular social studies classes and the co-teach social studies classes. However, in respect to the correlation of academic achievement scores of general education students by gender with co-teach instructional arrangements and non-co-teach instructional arrangements no statistically significant difference in Grade 10 TAKS social studies test was found.

English language learner status of students. There were some statistically significant differences observed among the second category of students investigated on the Grade 10 TAKS science test. Based on the results found in Table 10 in relation to the regular science classes or co-teach science classes, this researcher found that

ELL students in the regular science classes scored the same as those students in the co-teach science classes. In relation to the ELL status of the student, this researcher found that ELL students scored significantly lower on the Grade 10 TAKS science test than non-ELL students. That is, in relationship to the relative student achievement outcomes of ELL and non-ELL students in regular science classes and co-teach science classes, it was found that ELL students scored at a statistically significant lower level on the Grade 10 TAKS science test than non-ELL students regardless of their participation in regular science classes or co-teach science classes.

There were also some statistically significant differences observed among the second category of students investigated on the Grade 10 TAKS social studies test. Based on the results found in Table 12, in relation to the regular social studies classes or co-teach social studies classes, this researcher found that ELL students in the regular social studies classes scored the same as those students in the co-teach social studies classes. In relation to the ELL status of the student, this researcher found that ELL students scored significantly lower on the Grade 10 TAKS social studies test than non-ELL students. That is, in relationship to the relative student achievement outcomes of ELL and non-ELL students in regular science classes and co-teach science classes, this researcher found that ELL students scored at a statistically significant lower level on the Grade 10 TAKS social studies test than non-ELL students regardless of their participation in regular science classes or co-teach science classes.

Economic disadvantaged status of students. There were some statistically significant differences observed among the third category of students investigated on the Grade 10 TAKS science test. Based on the results found in Table 14, in relation to the regular science classes or co-teach science classes, this researcher found that economically disadvantaged students in the regular science classes outperformed those students in the co-teach science classes. In relation to the economically disadvantaged status of the student, this researcher found economically disadvantaged students statistically underperformed their non-economically disadvantaged peers in both the regular science classes and the co-teach science classes on the Grade 10 TAKS science test. In relation to the interaction between the regular science classes or co-teach science classes and the economic disadvantaged status of the student, this researcher found that economically disadvantaged students scored below the non-economically disadvantaged students on the Grade 10 TAKS science test.

There were some statistically significant differences observed among the third category of students investigated on the Grade 10 TAKS social studies test. Based on the results found in Table 16, in relation to the regular social studies classes or co-teach social studies classes, this researcher found that economically disadvantaged students in the regular social studies classes underperformed those students in the co-teach social studies classes. In relation to the economic disadvantaged status of the student, this researcher found economically disadvantaged students statistically underperformed their non-economically disadvantaged peers in both the regular social studies classes and the co-teach social studies classes on the Grade 10 TAKS social studies test. In relation to the interaction between the regular social studies

classes or co-teach social studies classes and the economic disadvantaged status of the student, this researcher found that economically disadvantaged students scored below their non-economically disadvantaged peers on the Grade 10 TAKS social studies test regardless of placement in the regular social studies classes or the co-teach social studies classes.

Ethnicity status of students. There were some statistically significant differences observed among the last category of students investigated on the Grade 10 TAKS science test. Based on the results found in Table 18, in relation to the regular science classes or co-teach science classes, this researcher found that the ethnic status of students in the regular science classes outperformed those students in the co-teach science classes. In relation to the ethnic status of the student, this researcher found that the differing ethnic groups of students statistically underperformed in both the regular science classes and the co-teach science classes on the Grade 10 TAKS science test. Based on the results found in Table 19, Whites scored significantly higher on the Grade 10 TAKS science test. African Americans and Hispanics had the lowest scores on the Grade 10 TAKS science test. The Asian/Pacific Islander ethnic group scored between the Whites and the African American/Hispanics ethnic groups. In relation to the interaction between the regular science classes or co-teach science classes and the ethnicity status of the students, it was found that ethnic groups of students scored the same, regardless of placement in regular science classes or co-teach science classes.

There were some statistically significant differences observed among the last category of students investigated on the Grade 10 TAKS social studies test. Based on the results found in Table 21, in relation to the regular social studies classes or co-teach social studies classes, this researcher found that the ethnic status of students in the regular social studies classes outperformed those students in the co-teach social studies classes. In relation to the ethnic status of the student, this researcher found that the differing ethnic groups of students statistically underperformed in both the regular social studies classes and the co-teach social studies classes on the Grade 10 TAKS social studies test. Based on the results found in Table 22, Whites scored significantly higher on the Grade 10 TAKS social studies test. African Americans and Hispanics had the lowest scores on the Grade 10 TAKS social studies test. The Asian/Pacific Islander ethnic group scored between the Whites and the African American/Hispanics ethnic groups. In relation to the interaction between the regular social studies classes or co-teach social studies classes and the ethnicity status of the students, this researcher found that ethnic groups of students scored the same, regardless of placement in regular social studies classes or co-teach social studies classes.

There has been no any previous literature relating the TAKS achievement level of general education students and students with disabilities in co-teach classes by gender, English language learner status, socioeconomic status, and ethnicity. However, the results of a study by Belmarez (1998) found that middle school students without disabilities in a co-taught classroom showed no significant difference in mathematic achievement when compared to that of the control groups who received

mathematics instruction in the general education classroom. These findings do not concur with the results of this study.

Recommendations for Future Research and Practice

Several recommendations for future research and practice that may be valuable to general educators, special educators, and school administrators can be drawn from this study's conclusions. Several authors who have focused on co-teaching models (Bauwens & Hourcade, 1991; Cook & Friend, 1995; Vaughn, Schumm & Arguelles, 1997; Walther-Thomas et al., 2000) claimed that the instruction provided to students in co-taught classes will be more intense, with a wider range of classroom options because of the additive effect of the special education teacher. The results of this study do not support those findings. This study found that general education students in regular classes performed better than general education students in co-teach classes.

Research has suggested that co-teaching has been widely accepted by teachers who advocate for the practice with little quantitative research to back it up (Mastropieri & Scruggs, 2004). Some studies have shown that this model meets both the social and academic needs for students with disabilities in the least restrictive environment (Walsh & Snyder, 1993). Although a respectable amount of research has been conducted on co-teaching and students with disabilities, there is not any relevant research involving general education students in co-teach classes. A thorough review of the existing research literature pertaining to the correlation between co-teaching

arrangements and student achievement of general education students in co-taught classes reveals no relevant previous research findings.

Nevertheless, such a relationship constitutes an important research question because there has been and continues to be widespread concern, especially among parents of general education students involved in co-teaching arrangements. Parents are concerned about the impact upon the quality of their general education students' classroom resources when they are placed in classrooms with students with disabilities. Therefore, the research in this study is, in effect, seminal research.

Although, the results of this research naturally cannot be conclusive at this early stage, its findings can constitute a preliminary suggestion that these concerns may indeed be well-founded. The need for replication studies is clearly suggested by these initial findings. Therefore, additional research examining co-teaching and academic achievement of general education students in co-taught classes needs to be conducted to evaluate academic achievement of general education students in those co-taught classes.

Research is also needed to investigate the procedure used, if any, to place general education students in co-teach classes at the secondary level. Moreover, the numbers of general education students placed in co-teach classes in relation to the students with disabilities in those classes should be examined in relation to the student achievement of both general education students and students with disabilities in those classes.

Another promising research question involves a more systematic and standardized definition of the co-teaching models themselves and the differential relationship of

those models may have on the student achievement of general education students in co-teach classes. Research comparing performance within more discreetly defined co-teaching models is needed to provide a clearer picture of effects of the special education co-teaching model on general education students in those classes. For example, follow-up research comparing the performance of students within the parallel, alternative, and team teaching co-teach methodologies would provide valuable evidence regarding the relative impact of each of these models upon the academic achievement of their general education students.

Finally, this study should be replicated in other subject areas, grade levels, and schools to discover if the findings of such studies concur with this research study. Subject areas could include English and math. General education students at the elementary level and at the middle school level would also provide further results relevant to practice.

Educational practitioners need to re-examine co-teach programs, the co-teach models that they are using and the selection process and criteria for selection of both general education students and special education students for participation in co-teach settings. In view of the preliminary findings of this study, educational practitioners employing co-teach as an inclusive structure should closely re-examine student academic achievement as a function of the co-teach practice itself and variations within the practice of co-teaching. For instance, student achievements of students in co-teach arrangements should be carefully compared to that among students in other inclusive instructional arrangements.

Additionally, educational practitioners should assess the process of placing general education students in co-teach classes. Administrators and counselors should actively plan with special education staffs in scheduling co-teach classes and the general education students that are placed in those classes. If there are certain criteria for a general education student to be placed in a co-teach class, the validity of the criteria should be evaluated as well.

Furthermore, collecting and evaluating data with a variety of assessments during the school year would provide ongoing information on the achievement of all students in co-teach classes. The method districts use to code general education students and students with disabilities in co-teach classes should be studied so data can be collected and analyzed effectively and efficiently.

Similarly, the relative academic achievement among students involved in one teaching/one assisting, station teaching, parallel teaching, alternative teaching, and team-teaching should be closely tracked to establish which, if any, of these competing models tend to produce higher levels of student achievement. Detailed analysis of correlations between student achievement levels and pre-selection procedures and criterion for student participation in co-teach arrangements, other inclusive arrangements, and general education classes would also appear to be essential for responsible practice. Essentially, this prescription merely constitutes a prescription for conscientious reflective practice (Sergiovanni, 1991).

The findings of this study of the academic achievement of general education students in co-teach classes are undeniably disturbing. The co-teach arrangement for achieving inclusion of special education students in settings with general education

students has certainly been one of the most common techniques to reach that generally accepted goal. Yet, the results of this study tend to lend credence to deep seated reservations about potentially damaging results of this approach to general education students sharing in the co-teach experience. It will be important for the appropriate implementation of the lofty goal of inclusion that these early and sketchy results neither be accepted as conclusive nor discounted as aberrational. Rather, this study must stimulate further empirical research and carefully focused reflective practice.

REFERENCES

- Adams, L., & Cessna, K. (1991). Designing systems to facilitate collaboration: Collective wisdom from Colorado. *Preventing School Failure, 35*(4), 37-42.
- Archer, J. (1998). Students' fortunes rest with assigned teachers. *Education Week, 17*(23), 24.
- Baldwin, M. K. (2003). Effects of co-teaching on student participation and math success on students with learning disabilities in the general education classroom. *Dissertation Abstracts International, 42*(02). (ATT 1415793)
- Bauwens, J., & Hourcade, J. J. (1991). Making co-teaching a mainstreaming strategy. *Preventing School Failure, 35*(4), 19-24.
- Bauwens, J., & Hourcade, J. J., & Friend, M. (1989). Cooperative teaching: A model for general and special education integration. *Remedial and Special Education, 10*(2), 17-22.
- Bear, G., & Proctor, W. (1990). Impact of a full time integrated program on the achievement on non-handicapped and mildly disabled children. *Exceptionality, 1*, 227-238.
- Becker, W. C. (1971). Teaching concepts and operations, or how to make kids smart. In W. C. Becker, S. Engelmann, & D. R. Thomas, *Teaching: A course in applied psychology* (pp. 401-423). Chicago: Science Research Associates.
- Belmarez, B. L. (1998). The relationship between co-teaching and the mathematic achievement of seventh-grade students with and without learning disabilities. *Dissertation Abstracts International, 64*(12). (ATT 3114999)
- Bereiter, C. & Engelmann, S. (1966). *Teaching disadvantaged children in the pre-school*. Englewood Cliffs, NJ: Prentice-Hall.
- Bloom, B. S. (1956). *Taxonomy of educational objectives: Handbook I. cognitive domain*. New York: David McCay Co.
- Borg, W. R., & Gall, M. D. (1989). *Educational research: An introduction* (5th ed.). New York: Longman.
- Boscardin, M. L. (2004). Transforming administration to support Science in the schoolhouse for students with disabilities. *Journal of Learning Disabilities, 37*(3), 262-269.

- Boudah, D., Schumaker, J., & Deshler, D. (1997). Collaborative instruction: Is it an effective option for inclusion in secondary classrooms? *Learning Disability Quarterly*, 20, 293-316.
- Bowe, F. (2005). *Making inclusion work*. Upper Saddle River, NJ: Pearson.
- Briggs, K. L. & Thomas, K. (1997). *Patterns of success: Successful pathways to elementary literacy in Texas spotlight schools*. Austin, TX: Texas Center for Educational Research.
- Burstein, N., Sears, S., Wilcoxon, A., Cabello, B., & Spagna, M. (2004). Moving toward inclusive practices. *Remedial and Special Education*, 25(2), 104-116.
- Cawley, J. F., Hayden, S., Cade, E., & Baker-Kroczyński, S. (2002). Including students with disabilities into the general education Science classroom. *Exceptional Children*, 68, 423-435.
- Chalk Talk. (2003). *Highly qualified teachers and NCLB*. Retrieved September 18, 2007, from http://www.esc12.net/publications/docs/fallchalktalk_03.pdf
- Cook, L., & Friend, M. (1995). Co-teaching: guidelines for creating effective practices. *Focus on Exceptional Children*, 28(3), 1-16.
- Darling-Hammond, L. (1996). The role of teacher expertise and experience in students' opportunity to learn. *Strategies for linking school finance and students' opportunity to learn*. Washington, DC: National Governors Association.
- DeBoer, A. L. & Fister, S. L. (1995). *Working together: Tools for collaborative teaching*. Longmont, CO: Sopris West.
- Deshler, D. D., Shumaker, J. B. Lenz, B. K., Bulgren, J. A., Hock, M. F., Knight, J., & Ehren, B. J. (2001). Ensuring content-area learning by secondary students with learning disabilities. *Learning Disabilities Research and Practice*, 16(2), 96-108.
- Dieker, L. A. (1998). Rationale for coteaching. *Social Studies Review*, 37(2), 62-65.
- Dieker, L. A., & Little, M. (2005). Secondary reading: Not just for reading teachers anymore. *Intervention in School and Clinic*, 40(5), 276-283.
- Dieker, L. A., & Murawski, W. W. (2003). Co-teaching at the secondary level: Unique issues, current trends, and suggestions for success. *High School Journal*, 86(4), 1-13.
- Drury, D. & Doran, H. C. (2003). The value of value-added analysis. *National School Boards Association Policy Research Brief*, 3(1), 1-4.

- Faust, J. (2005). IDEA 2004: Flexibility options. *CASE*, 47(2), 3-5.
- Feldman, R. K. (1998). A study of instructional planning of secondary special and general education co-teachers to accommodate learning disabled students in the general education classroom. *Dissertation Abstracts International*, 58(07), 4731A. (UMI No. 9900508)
- Ferguson, D. L. (1996). Is it inclusion yet? Bursting the bubbles. In M. S. Berres, D. L. Ferguson, P. Knoblock, & C. Woods (Eds.), *Creating tomorrow's schools today: Stories of inclusion, change and renewal* (pp. 16-37). New York: Teachers College Press.
- Fletcher, J. M., Lyons, G. R., Barners, M., Stuebing, K. K., Francis, D. J., Olson, R. K., et al. (2001). *Classification of learning disability: An evidence based evaluation*. Executive Summary. Washington, DC: United States Department of Education, Office of Special Education Programs.
- Foley, B., & Reder, N. (2002). *Implementing the No Child Left Behind Act: What it means for IDEA*. Retrieved April 10, 2007, from <http://www.nasdse.org/publications.cfm>
- Food and Nutrition Service. (2007). *School meals: Income eligibility guidelines*. Retrieved November 17, 2007, from <http://www.fns.usda.gov/cnd/governance/notices/iegs/iegs.htm>
- Friend, M., & Cook, L. (1992). The new mainstreaming. *Instructor*, 101(7), 30-36.
- Friend, M., & Cook, L. (2007). *Interactions: Collaboration skills for school professionals* (5th ed.). White Plains, NY: Longman.
- Friend, M., & Reising, M. (1993). Co-teaching: An overview of the past, a glimpse at the present, and considerations for the future. *Presenting School Failure*, 37(4), 6-11.
- Friend, M., Reising, M., & Cook, L. (1993). Co-teaching: An overview of the past, glimpse at the present, and considerations for the future. *Preventing School Failure*, 37, 6-10.
- Fuchs, D., Fuchs, L. S., Mathes, P. G., Lipsey, M. W., & Roberts, P. H. (2001). *Is learning disability just a fancy term for low achievement? A meta-analysis of reading differences between low achievers with and without the label*. Executive Summary. Washington, DC: United States Department of Education, Office of Special Education Programs.

- Gale, P. F. (2005). Performance of students with specific learning disabilities in co-taught and pullout models of education. *Dissertation Abstracts International*, 65(12). (ATT 3156007)
- Gall, M., Borg, W., & Gall, J. (1996). *Educational research: An introduction*. White Plains, NY: Longman Publishers.
- Gerber, P. & Popp, P. (1999). Making collaborative teaching more effective for academically able students: Recommendations for implementation and training. *Learning Disabilities Quarterly*, 23,(3), 229-236.
- Gravetter, F., & Wallnau, L. (2005). *Essentials of statistics for the behavioral Sciences*. Belmont, CA: Wadsworth/Thompson.
- Gresham, F. (2001). *Responsiveness to intervention: An alternative approach to the identification of learning disabilities*. Washington, DC: United States Department of Education, Office of Special Education Programs.
- Hardman, M. L., Rosenberg, M., & Sindelar, P. (2005). NCLB, IDEA, and alternative routes in preparation of rural special education teachers in high incidence areas. *Rural Special Education Quarterly*, 24(1), 16-22.
- Harris, K. C., Harvey, P., Garcia, L., Innes, D., Lynn, P., Munoz, D., Genderton, K., & Stoica, R. (1987). Meeting the needs of special high school students in regular education classrooms. *Teacher Education and Special Education*, 10, 143-152.
- Haselden, K. G. (2004). Effects of co-teaching on the biology achievement of typical and at-risk students educated in secondary inclusion settings. *Dissertation Abstracts International*, 65(01). (ATT 3119816)
- Haycock, K. (1998). Good teaching matters: How well-qualified teacher can close the gap. *Education Trust*, 3(2), 1-31.
- Hunt, P., Staub, D., & Alwell, M. (1994). Achievement by all students within the context of cooperative learning groups. *Journal of the Association for Persons with Severe Handicaps*, 19, 290-301.
- Idol, L. (1997). Key questions related to building collaborative and inclusive schools. *Journal of Learning Disabilities*, 30, 384-394.
- Individuals with Disabilities Education Act Amendments of 1997 (IDEA '97), PL 105-17, 105 U.S.C. 1400 et seq.
- Individuals With Disabilities Education Improvement Act of 2004 (IDEA), Pub. L. No. 108-446, 118 Stat. 2647 (2004). [Amending 20 U.S.C. 1400 et seq.].

- Jenkins, J., & O'Connor, R. (2001). *Early identification and intervention for young children with reading and learning disabilities*. Washington, DC: United States Department of Education, Office of Special Education Programs.
- Keefe, E. B., & Moore, V. (2004). The challenge of co-teaching in inclusive classrooms at the high school level: What the teachers told us. *American Secondary Education*, 32(3), 77-88.
- King-Sears, M. E., & Cummings, C. S. (1996). Inclusive practices of classroom teachers. *Remedial and Special Education*, 17, 217-225.
- Knudson, K. (2005). The effects of co-teaching in a secondary classroom on the academic achievement with mild to moderate disabilities. *Dissertation Abstracts International*, 43(06). (ATT 1426318)
- Lyons, G. R., Fletcher, J. M., Shaywitz, S. E., Shaywitz, B. A., Torgesen, J. K., Wood, F. B., et al. (2001). Rethinking learning disabilities. In C. E. Fin, A. J. Rotherham, & C. R. Hosanson, Jr. (Eds.), *Rethinking special education for a new century* (pp. 259-287). Washington, DC: Thomas B. Fordham Foundation.
- Marston, D. (1996). A comparison of inclusion only, pull-out only, and combined service models for students with mild disabilities. *The Journal of Special Education*, 30, 121-132.
- Mastropieri, M. A., & Scruggs, T. E. (2001). Promoting inclusion in secondary classrooms. *Learning Disabilities Quarterly*, 24, 265-274.
- Mastropieri, M. A., & Scruggs, T. E. (2004). Science and schooling for learning disabilities. *Journal of Learning Disabilities*, 37, 270-276.
- Mastropieri, M. A., Scruggs, T. E., Graetz, J., Norland, J., Gardizi, W., & McDuffie, K. (2005). Case studies in co-teaching in the content areas: Successes, failures and challenges. *Intervention in School and Clinic*, 40, 260-270.
- McCaffrey, D. F., Lockwood, J. R., Koretz, D. M., & Hamilton, L. S. (2003). *Evaluating value-added models for teacher accountability*. Santa Monica, CA: The Rand Corporation.
- McLaughlin, M. J., & Thurlow, M. (2003). Educational accountability and students with disabilities: Issues and challenges. *Educational Policy*, 17(4), 431-450.
- Moll, L. (1988). Some key issues in teaching Latino schools. *Language Arts*, 65, 465-472.

- Murawski, W. (2006). Student outcomes in co-taught secondary English classes: How can we improve? *Reading & Writing Quarterly*, 22(3), 227-247.
- Murawski, W., & Dieker, L. (2004). Tips and strategies for co-teaching at the secondary level. *Teaching exceptional children*, 36(5), 52-58.
- Murawski, W., & Swanson, H. (2001). A meta-analysis of co-teaching research. *Remedial & Special Education*, 22(5), 258-268.
- National Center for Educational Restructuring and Inclusion. (1995). *National study of inclusion*. New York: Author.
- No Child Left Behind Act of 2001. Pub. L. 107-220. (2001). Retrieved April 5, 2007 from <http://www.acess.gpo.gov/nara/publaw/107publ.html>
- Public Education Information Management System (PEIMS). (2007). Texas Education Agency website. Retrieved November 7, 2007. From <http://www.tea.state.tx.us>
- Rea, P. J., & Connell, J. (2005). Minding the fine points of co-teaching. *The education digest*, 71(1), 29-36.
- Rea, P. J., McLaughlin, V. L., & Walther-Thomas, C. (2002). Outcomes for students with learning disabilities in inclusive and pullout programs. *Exceptional Children*, 68(2), 203-223.
- Reeve, P. T., & Hallahan, D. P. (1994). Practical questions about collaboration between general and special educators. *Focus on Exceptional Children*, 26(7), 1-10.
- Rice, D., & Zigmond, N. (1999). Co-teaching in secondary schools: Teacher reports of development in Australian and American classrooms. *Learning Disabilities Research and Practice*, 15, 190-197.
- Rosenfield, S. (1992). Developing school based consultation teams: A design for organizational change. *School Psychology Quarterly*, 7, 27-46.
- Salend, S., & Duhaney, L. (1999). The impact of inclusion on students with and without disabilities and their educators. *Remedial and Special Education*, 20(2), 114-26.
- Salend, S., Gordon, J., & Lopez-Vona, K. (2002). Evaluating cooperative teaching teams. *Intervention in School and Clinic*, 37(4), 195-200.

- Sapon-Shevin, M. (1996). Full inclusion as disclosing tablet: Revealing the flaws in our present system. *Theory Into Practices*, 35, 35-41.
- Schlechty, P. C. (1990). *Schools for the twenty-first century: Leadership imperatives for educational reform*. San Francisco: Jossey-Bass.
- Schleisman, K. E., & King, J. A. (1990). *Making sense of outcome-based education: Where did it come from, and what is it?* (Research Report No. 7). Minneapolis: University of Minnesota, Center for Applied Research and Educational Improvement.
- Schulte, A. C., Osbourne, S. S., & McKinney, J. D. (1990). Academic outcomes for students with learning disabilities in consultation and resource programs. *Exceptional Children*, 57(2), 162-175.
- Sergiovanni, T. (1991). *The principalship: A reflective practice perspective*. Boston: Allyn and Bacon.
- Sharpe, M., York, J., & Knight, J. (1994). Effects of inclusion on the academic performance of classmates without disabilities. *Remedial and Special Education*, 15(5), 281-287.
- Sileo, J. M. (2003). Co-teaching: Rationale for best practices. *Journal of Asia-Pacific Special Education*, 3(1), 17-26.
- Snell, M. E., & Janney, R. (2005). *Collaborative teaming*. Baltimore: Paul H. Brookes.
- Stone, C. A., & Reid, D. K. (1994). Social and individual forces in learning: Implications for instruction of children with learning disabilities. *Learning Disability Quarterly*, 17, 72-85.
- Texas Education Agency (TEA). (2007a). TAKS 2006 Science and Data Analyses. Retrieved November 2, 2007, from <http://www.tea.state.tx.us/>
- Texas Education Agency (TEA). (2007b). TAKS 2006 Social Studies and Data Analyses. Retrieved November 2, 2007, from <http://www.tea.state.tx.us/>
- Texas Education Agency (TEA). (2007c). Student assessment division. Retrieved November 9, 2007, from <http://www.tea.state.tx.us/students.assessment/resources/guides/tli.html>
- Thurlow, M. L. (2002). *Accommodations for students with disabilities in high school. Issue Brief*. Minneapolis: National Center on Secondary Education and Transition.

- Thurlow, M. L., Lazarus, S. S., Thompson, S. J., & Morse, A. B. (2005). *State policies on assessment participation and accommodations for students with disabilities, 2003*. Synthesis Report 56. Minneapolis: National Center on Educational Outcomes.
- Trochim, W. (2002). *Research methods knowledge base*. Retrieved October 14, 2007, from <http://www.socialresearchmethods.net/kb/>
- U. S. Department of Education. (1995). Seventeenth annual report to Congress on the implementation of the Individuals with Disabilities Act. Washington, DC: U. S. Government Printing Office.
- U. S. Department of Education. (2002). High standards for all students: A report from the National Assessment of Title I on progress and challenges because of the 1994 reauthorization. Washington, DC: U. S. Government Printing Office.
- Vaughn, S., Bos, C. S., & Schumm, J. S. (2003). *Teaching Exceptional, Diverse, and At-Risk Students in the General Education Classroom*. Boston, MA: Allyn and Bacon.
- Vaughn, S., Elbaum, B. E., Schumm, J. S., & Hughes, M. T. (1998). Social outcomes for students with and without learning disabilities in inclusive classrooms. *Journal of Learning Disabilities, 31*, 428-436.
- Vaughn, S., Schumm, J., & Arguelles, M. (1997). The ABCDEs of co-teaching. *Teaching Exceptional Children, 30*, 4-10
- Villa, R. A., Thousand, J. S., Meyers, H., & Nevin, A. (1996). Teacher and administrator perceptions of heterogeneous education. *Exceptional Children, 63*(1), 29-49.
- Villa, R. A., Thousand, J. S., & Nevin, A. I. (2004). *A guide to co-teaching*. Thousand Oaks, CA: Corwin Press.
- Villa, R. A., Thousand, J. S., Nevin, A., Liston, A. (2005). Successful inclusive practices in middle and secondary schools. *American Secondary Education Journal, 33*(1), 33-50.
- Walsh, J. M., & Snyder, D. (1993). *Cooperative teaching: An effective model for all students*. Paper presented at the Annual Convention of the Council for Exceptional Children. San Antonio, TX.

- Walther-Thomas, C. (1997). Co-teaching experiences: The benefits and problems that teachers and principals report over time. *Journal of Learning Disabilities*, 30(4), 395-407.
- Walther-Thomas, C., Bryant, M., & Land, S. (1996). Planning for effective co-teaching: The key to successful inclusion. *Remedial and Special Education*, 17(4), 255-264.
- Walther-Thomas, C. , & Carter, K. L. (1993). Co-teaching experiences: The benefits and problems that teachers report over time. *Journal of Learning Disabilities*, 30, 397-407.
- Walther-Thomas, C., Korinek, L., McLaughlin, C., & Williams, C. (2000). *Collaboration for inclusive education: Developing successful programs*. Needham Heights, MA: Allyn and Bacon.
- Ward, R. (2003). General educators' perceptions of effective collaboration with special educators: A focus group study. *Dissertation Abstracts International*, 64(03), 861A. (UMI No. 3083896)
- Weichel, W. (2001). An analysis of student outcomes on co-taught settings in comparison to other special education service delivery options for students with learning disabilities. *Dissertation Abstracts International*, 62(07), 2386A. (UMI No. 3021407)
- Weiss, M. P., & Brigham, F. J. (2000). Coteaching and the model of shared responsibility: What does the research support? In T. E. Scruggs & M. A. Mastropieri (Eds.), *Educational interventions: Advances in learning and behavioral disabilities* (Vol. 14, pp. 217-246). Stanford, CT: JAI Press.
- Weiss, M. P., & Lloyd, J. (2002). Congruence between role and actions of secondary special educators in co-taught and special education settings. *The Journal of Special Education*, 36(2), 58-68.
- Welch, M. (2000). Descriptive analysis of team teaching in two elementary classrooms: A formative experimental approach. *Remedial and Special Education*, 21(6), 316-376.
- Welch, M., & Sheridan, S. M. (1999). What's the score and game plan on teaming in schools? A review of the literature in team teaching and school-based problem-solving teams. *Remedial & Special Education*, 21(1), 36-50.
- Wiggins, G. (1989). The futility of trying to teach everything of importance. *Educational Leadership*, 47, 44-59.

- Wischnowski, M. W., Salmon, S., & Eaton, K. (2004). Evaluating co-teaching as a means for successful inclusion of students with disabilities in a rural district. *Rural Special Education Quarterly*, 23(03), 3-14.
- Yell, M. L., & Rogers, D. (1998). The legal history of special education. *Remedial and Special Education*, 19(4), 219-229.
- Ysseldyke, J. E., O'Sullivan, P. J., Thurlow, M. L., & Christenson, S. L. (1991). Qualitative differences in reading and math instruction received by handicapped students. *Remedial and Special Education*, 10(1), 14-20.
- Ysseldyke, J. E., Thurlow, M. L., & Bruininks, R. H. (1992). Expected outcomes for students with disabilities. *Remedial and Special Education*, 13(6), 19-30.
- Zigmond, N. (2001). Special education at a crossroads. *Preventing School Failure*, 45(2), 70-75.
- Zins, J. E., Curtis, M. J., Graden, J. L., & Ponti, C. R. (1998). *Helping students succeed in the regular classroom: A guide for developing intervention assistance teams*. San Francisco: Jossey-Bass.

VITA

Name: Nancy Guido Neugebauer

Address: 1955 Creek Hollow
San Antonio, Texas 78259

Email Address: nneugebauer@satx.rr.com

Education: B.S., Psychology, Texas A&M University, 1976
M.Ed., Educational Psychology, Texas A&M University, 1979
Ed.D., Educational Administration, Texas A&M University,
2008

Professional Experience: Director, North East ISD, San Antonio, TX, July 2007 -
present
Principal, North East ISD, San Antonio, TX, July 2002 – July
- 2007
Assistant Principal, North East ISD, San Antonio, TX,
September 1996 – July 2002
Special Education Teacher, North East ISD, San Antonio, TX,
August 1977 – September 1996

Professional Affiliations: Texas Association of Secondary School Principals
Texas Association of School Administrators
Texas Council of Administrators of Special Education
Kappa Delta Pi

The typist for this record of study was Mr. Bill A. Ashworth, Jr.