Gardner-Webb University
Digital Commons @ Gardner-Webb University

Education Dissertations and Projects | School of Education

2010

The impact of inclusion on the academic achievement of high school special education students

Harold Smith Dawkins
Gardner-Webb University

Follow this and additional works at: https://digitalcommons.gardner-webb.edu/education_etd


Part of the Educational Assessment, Evaluation, and Research Commons, Educational Methods Commons, Secondary Education and Teaching Commons, and the Special Education and Teaching Commons

Recommended Citation

Dawkins, Harold Smith, "The impact of inclusion on the academic achievement of high school special education students" (2010). *Education Dissertations and Projects*. 93.
https://digitalcommons.gardner-webb.edu/education_etd/93

This Dissertation is brought to you for free and open access by the School of Education at Digital Commons @ Gardner-Webb University. It has been accepted for inclusion in Education Dissertations and Projects by an authorized administrator of Digital Commons @ Gardner-Webb University. For more information, please see Copyright and Publishing Info.

The Impact of Inclusion on the Academic Achievement of High School Special Education Students

By
Harold Smith Dawkins

A Dissertation Submitted to the
Gardner-Webb University School of Education
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

Gardner-Webb University
2010

Approval Page

This dissertation was submitted by Harold Smith Dawkins under the direction of the persons listed below. It was submitted to the Gardner-Webb University School of Education and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Gardner-Webb University.

_____	_____
David W. Shellman, Ed.D. Committee Chair	Date
_____	_____
A. Douglas Eury, Ed.D. Committee Member	Date
_____	_____
Jane King, Ed.D. Committee Member	Date
_____	_____
Gayle Bolt Price, Ed.D. Dean of the Graduate School	Date

Abstract

The Impact of Inclusion on the Academic Achievement of High School Special Education Students. Dawkins, Harold Smith, 2010: Dissertation, Gardner-Webb University, Impact/Inclusion/Academic Achievement/High School/Special Education Students

This dissertation examined the impact of inclusion on the academic achievement outcome of high school special education students as measured by English 1, biology, and algebra 1 as a function of gender, ethnicity, and years of inclusion. The study also examined the generalizations with confidence that could be made about the use of inclusion methodology in high schools within an urban North Carolina school district as measured by end-of-course test scale scores. Data from three traditional high schools within the Charlotte-Mecklenburg School District were used in this study. High school special education students lagged behind several other subgroups on end-of-course tests proficiency. A quantitative study was conducted. End-of-course test data were collected from 2002-2005 for resource school years and from 2006-2009 for inclusion school years. The mean end-of-course test scale scores for special education students who experienced inclusion teaching methodology and those students who experienced resource-only teaching methodology were examined over a 6-year period of time.

An analysis of variance found statistically significant differences between the three schools. The use of 95% confidence intervals helped to make inferences about mean scale scores from a sample statistic toward a population parameter. English 1 special education students did not benefit from inclusion and the years in the inclusion program did not impact students' academic achievement. Male and female students produced their highest percent proficient during resource years. Both Black and White English 1 students also produced their highest percent proficient during resource years. Biology special education students showed increases in percent proficient during inclusion years. They experienced a pattern of positive gaps when the years in the inclusion program were examined. Male and female biology students benefitted academically from inclusion. Both Black and White biology students showed academic gains during the years of inclusive practices. Algebra 1 special education students in general showed positive gaps in academic proficiency when they experienced inclusion. The years in the inclusion program did not positively impact academic gains for algebra 1 students. Male and female special education students benefitted academically from inclusive algebra 1. Black algebra 1 students showed trends of positive gaps in academic proficiency during inclusion years, but White students did not. The other minorities (Asian, Hispanic, Multi-racial, and Native Americans) did not produce sufficient data in order to see trends. Findings of this study are encouraging for the use of inclusion teaching methodology to increase academic achievement outcomes in some subject areas for high school special education students within an urban North Carolina school district.

Table of Contents

Tables

Chapter 1: Introduction and Problem Statement

Introduction

Exceptional children have lagged behind other students in proficiency on end-of-course tests within an urban North Carolina school district. Pressures that emanated from the No Child Left Behind (NCLB, 2003), Judge Howard Manning, and Governor Easley proliferated relative to accountability at the high school level. Numerous studies have been conducted at the elementary school level that documented the benefits and challenges of inclusive practices (Keefe & Moore, 2004). Unfortunately, there are no well-documented studies about inclusion at the high school level (Keefe & Moore). As a result, the recommendations from this study can impact the academic achievement of high school special education students in this urban North Carolina school district. In addition, this study can influence educational practice and theory on the secondary level in school districts by adding to the knowledge base and repertoire of strategies for effectively teaching high school special education students.

Statement of the Problem

In recent years, the federal government played a greater role in the education of school children. This reality was evident with the emergence of the No Child Left Behind Act of 2001. For reliable Adequate Yearly Progress (AYP) determinations, North Carolina decided that the minimum group size is the larger of 40 or 1% of students in the school (U. S. Department of Education, 2009). In addition, Adequate Yearly Progress as prescribed by NCLB must be met in order to close the achievement gap between the various subgroups. To compound the challenge faced by North Carolina schools, North Carolina Superior Court Judge Howard Manning pressured the lagging high schools to reach at least 60% proficiency on end-of-course tests under the North Carolina ABCs

accountability standards (Judge Manning's Report, 2005). Judge Manning also threatened to close the high schools that were not able to reach and/or sustain the 60% proficiency level. Governor Mike Easley joined Judge Manning in applying pressure to low-performing high schools.

Within an urban North Carolina school district, special education students was one subgroup that lagged behind others on end-of-course tests scores. Thus, the focus of this study was to examine the impact of the inclusion methodology on the academic achievement of high school special education students as measured by end-of-course test scores. Inclusive practices were partially put into place in the high schools of this North Carolina urban school district at the beginning of the 2005-2006 school year. The researcher intends to generalize the results of this study to all high schools within the urban North Carolina school district that have a special education student population.

Table 1 provides the percentages of students at varied achievement levels for end-of-course (EOC) tests that were given during 2006 and 2007school years. This table revealed that exceptional children lagged behind other students in achieving at grade level (Levels III/IV) on EOC tests within an urban North Carolina school district.

Table 1

District Results for All EOCs (Percent of Students at Achievement Levels for End-of-Course Test Results)

		Number Tested	Percent at Levels I	II	III	IV	III/IV
	EC	3579	24.6	40.8	25.5	9	34.6
Spring 2006	Non-EC	50,757	8.8	28.1	39.7	23.4	63.1
	TD	9366	0.5	4.4	26.1	69.1	95.1
	EC	3073	31.5	33.9	26.9	7.7	34.6
Spring 2007	Non-EC	43,359	11.6	25.5	42.7	20.3	63.0
	TD	6933	0.6	3.2	27.1	69.2	96.2

EC= Exceptional Children
TD= Talent Development (Gifted & Talented Children)

Purpose of the Study

The purpose of this research study was to determine the impact of inclusion on the academic achievement of high school special education students as measured by end-of-course test scores. This study examined the impact on academic achievement when using the inclusion and resource teaching models, controlling for resource teaching methodologies within three different high schools. The independent variable, instructional methodology, was generally defined as treatments that the participants received. The dependent variable was generally defined as the academic achievement caused by the treatment. The control variable was resource teaching methodology and the intervening variable was teacher content knowledge. Both the control and intervening variables were statistically controlled in the study (Holloway, 2001). By definition, the resource methodology (pull-out) provided instructions from a special education teacher to only disabled students in a separate classroom.

Setting and Organizational Profile

An urban North Carolina school district consisted of 17 traditional high schools. Only three of seventeen high schools satisfied the Adequate Yearly Progress (AYP) requirements under the No Child Left Behind (NCLB) federal mandate at the end of the 2005-2006 school year. The North Carolina Department of Public Instruction website, "ABCs Search Results," displays the 2005-2006 AYP data for traditional high schools, shown in Table 2. Under NCLB, all subgroups within a school should perform at a designated proficiency percentage in English I, tenth-grade writing, and algebra I as measured by standardized North Carolina end-of-course tests. At the end of the 2005-2006 school year, there were four Finding Opportunity, Creating Unparalleled Success (FOCUS) high schools with overall proficiencies on EOC tests that were below 60%. FOCUS high schools were characterized by a disproportionate number of students on free and reduced price lunch and were schools that had a very noticeable number of students who were below grade level as measured by EOC test scores. The FOCUS high schools displayed a pattern of repetitively not reaching the 60% proficiency level on all end-of-course tests taken by students.

Table 2

2005-2006 High School Adequate Yearly Progress Results

High School	Met Expected	Met High	Performance Composite	ABCs Status	AYP
H.S. #1 – B	No	No	77.3	NR	No
H.S. #2 – EW	Yes	No	49.3	Pri Exp	No
H.S. #3 – E	Yes	No	63.6	Pro Exp	No
H.S. #4 – G	No	No	45.5	LP	No
H.S. #5 – HU	Yes	No	55.4	Pri Exp	Yes
H.S. #6 – H	No	No	64.0	NR	No
H.S. #7 – I	Yes	No	63.3	Pro Exp	No
H.S. #8 – M	Yes	No	81.6	Dst Exp	No
H.S. #9 – N	No	No	69.8	NR	No
H.S. #10 - NW	No	No	62.8	NR	No
H.S. #11 – O	Yes	No	55.6	Pri Exp	No
H.S. #12 - PB	Yes	No	51.0	Pri Exp	Yes
H.S. #13 – P	No	No	88.1	NR	Yes
H.S. #14 – S	Yes	Yes	72.2	Pro Hgh	No
H.S. #15 - WC	Yes	No	40.4	Pri Exp	No
H.S. #16 – W	Yes	Yes	48.0	Pri Hgh	No
H.S. #17 – V	Yes	Yes	60.8	Pro Hgh	No

*See Appendix

Table 3 data taken from the NCDPI website, “The ABCs Accountability Model,” delineates the proficiency level pattern of FOCUS high schools for the 2004-2005, 2005-

2006, and 2006-2007 school years. As a result, the district and the state gave these schools special attention. Typically, exceptional (special education) children are in a subgroup that underachieves on EOC tests. The 2006-2007 school year was officially the first year that this urban North Carolina school district utilized the inclusion model in its high schools. During the 2005-2006 school year, the school district did not flag the inclusion classes with regard to EOC test results and there was only partial inclusion participation among the high schools. The focus of this inclusion model is on all courses with end-of-course tests. Not only did special education students impact the overall academic proficiency of a high school, they are a subgroup for adequate yearly progress consideration under the NCLB federal mandate. This urban North Carolina school district gave noticeable attention to increasing the academic proficiency of high school students as measured by end-of-course achievement test scores. In this district, high schools lagged behind elementary and middle schools as it related to students' performance on standardized achievement tests.

Table 3

FOCUS High Schools Proficiency on End-Of-Course Tests

School	2004-2005	2005-2006	2006-2007
H.S. #1 - EEW	48.4	49.3	48.2
H.S. #2 - G	42.7	45.5	50.0
H.S. #3 - WC	37.1	40.4	46.1
H.S. #4 - WM	47.9	48.0	52.2

Research Questions

The research questions that shaped the focus of this study are as follows:

1. How does inclusion impact high school special education students' academic achievement outcomes as measured by biology, algebra I, and English I as a function of gender, ethnicity, and years of inclusion?

2. What generalizations with confidence can be made about the use of inclusion methodology in high schools within an urban North Carolina school district as measured by end-of-course test scale scores?

Hypothesis

Null Hypothesis: There will be no difference in academic achievement between high school special education students who experience inclusion and comparable students who experience the resource classroom as measured by average mean scale scores on end-of-course tests.

Definition of Terms

ABCs. A comprehensive North Carolina plan to improve public schools by focusing on strong accountability, teaching the basics, and local control (The ABCs of Public Education, 2006).

Adequate Yearly Progress (AYP). Represents satisfactory improvement each year toward the proficiency of all children by 2014 (http://www.ed.gov/nclb/accountability/schools/accountability.html).

Inclusion. "The collaboration between general and special education teachers for all of the teaching responsibilities of all students assigned to a classroom" (Gately & Gately, 2001, pp. 41).

No Child Left Behind (NCLB) Act. Signed by President Bush in January 2002. It required that all children be proficient in reading and math by 2014 (http://www.ed.gov./nclb/accountability/schools/accountability.html).

Resource (pull-out) model. Excludes special education students from the regular classroom (http://www.wmich.edu/coe/spls/news.htm).

Special education students. Students with varied disabilities that can impede their education (National Clearinghouse for Professions in Special Education).

FOCUS. An acronym for Finding Opportunity, Creating Unparalleled Success. FOCUS schools have a high incidence of poverty among students as measured by free and reduced price lunch and these schools have a noticeable number of students who are below grade level.

Talent Development (TD). Encompasses the gifted and talented students.

Summary

Special education students, as a subgroup, are very critical in helping high schools reach the goals of the federal mandate, NCLB. They are also paramount in helping North Carolina high schools reach their ABC proficiency goals. Due to their various disabilities, they also require various strategies to support them in their educational environments. Nevertheless, schools have the responsibility to educate all students and to produce productive citizens. This urban North Carolina school district employed the inclusion model in its high schools in order to enhance the academic achievement for special education students. The district utilized the content knowledge of regular education teachers and the accommodation skills of special education teachers to educate children with disabilities. Hopefully, this strategy will positively impact the academic achievement of high school special education students.

Chapter 2: Literature Review

Overview

This study examined the impact of inclusion on the academic achievement of high school special education students by targeting three different high schools in an urban North Carolina school district. The study utilized archival data for three high schools that used the resource-only teaching methodology with subsequent data when inclusion methodology was used at these same three high schools.

Introduction

Continued pressure from the federal No Child Left Behind Act (NCLBA) and the North Carolina ABCs caused the high schools in an urban North Carolina school district to focus on closing the gap among subgroups that lagged behind relative to Adequate Yearly Progress (AYP). In addition, the high schools of an urban high school district focused on increasing the overall proficiency for all students who take end-of-course tests in order to satisfy state requirements. Since the special education students' subgroup lagged behind on end-of-course tests results, this study examined the impact of inclusion methodology in three high schools in order to enhance the academic skill levels of special education students as measured by end-of-course test scores. These end-of-course test results for three urban North Carolina high schools were examined for 3 consecutive years when they utilized the resource-only model and when they subsequently used the inclusion model for 3 consecutive years.

The purpose of this chapter was to provide information about factors that positively and negatively impact the use of inclusion on high school special education students' academic skill levels. A review of the literature on this topic revealed some studies concerning inclusion at the secondary school level among special education

students. Unfortunately, there is a critical shortage of research on inclusion of students with disabilities at the secondary school level (Mastropieri & Scruggs, 2001).

What was Pre-Inclusion?

During the period of separate special education, specially trained teachers taught students according to their needs in individual or small group settings outside the regular education classroom. The needs of students were assessed initially and continuously and instruction was designed to meet those needs. Special educators had responsibilities that were both specific and distinctive. These uniquely trained teachers taught what was not offered in other places (Volonino & Zigmond, 2007).

In the 1980s, critics suggested that pull-out programs for special education students were ineffective and failed to satisfy students' needs, along with being an obstacle to their successful education. Earlier comparison between the resource room and general education placements leaned toward the resource room for students with learning and/or behavior disabilities (Leinhardt & Pallay, 1982; Madden & Slavin, 1983).

History of Inclusion in the United States

As we moved toward 1930, the disabled in colonial North America were isolated from the mainstream (Osgood, 2005). They were housed in family homes and other facilities until the 1800s. In the early to mid 1800s, Americans utilized public and private institutions for treatment and formal education of disabled students. Americans were motivated by European success in educating the disabled. In the early 1900s, institutions for the disabled proliferated and the stigmatization of the disabled increased by the latter 19th century.

During the latter 1800s, public schools provided special education services (Osgood, 2005). With the influx of immigrant children, academic and behavioral

challenges increased in schools. As a result, an anti-immigration initiative occurred because researchers found that a noticeable number of immigrants from certain regions of Europe scored in the moron range of intelligence on intelligence tests.

In 1869, the first formal public school for exceptional children opened in Boston for deaf-mutes (Osgood, 2005). In 1877, it was renamed the Horace Mann School for the Deaf. The first class for the mentally retarded occurred in Providence, Rhode Island and these classes increased conspicuously during the early 1900s with the aid of intelligence testing to identify the mentally impaired.

Education pioneers, historians, and educators thought that separate classes for students with disabilities were in the best interest of education due to the various challenges that it would bring to regular education classes (Osgood, 2005). Segregation of children with disabilities occurred well into the 20th century in mostly urban areas because small towns and rural areas did not have the resources to do so. Segregation prevailed for decades into the 20th century. Between 1930 and 1960, the number of special education students increased conspicuously due to sophisticated research and legal decisions (Osgood, 2005). Nevertheless, special education experienced a temporary setback during the Depression of the 1930s. Concerns about the social and academic ramifications of the segregationist approach in a democratic society proliferated between 1930 and 1963. The assumption that separate settings were best for special education continued into the 1950s, although efficacy studies since the 1930s compared the performance of special education students in both special classes and regular classes. Nevertheless, the Brown v. Board of Education of Topeka decision in 1954 impacted discussions about the appropriate settings for children with disabilities.

Between 1960 and 1968, the traditions in special education were challenged

(Osgood, 2005). The administration of President John F. Kennedy focused more on the civil rights of all citizens and adhering to the promise of public education. The increased federal government emphasis on special education persisted into the Johnson administration. In the 1960s, the quality of education and care at residential institutions was noticeably criticized. Consequently, a community-based avenue for educating students with disabilities gained favor.

By 1963, children with disabilities were integrated with general education students to some extent in the United States (Osgood, 2005). In 1966, only 35% of the children that needed special education were actually receiving it. Yet, the early 1960s brought a definite structure for the placement of students with disabilities in public schools, institutions, and other settings.

Burton Blatt, G. Orville Johnson, and Lloyd Dunn are three scholars who had concerns about special education (Osgood, 2005). Blatt critiqued special education in the 1960s and he thought that apparent mental retardation emanated from poverty or cultural deprivation associated with minority status. In addition, he considered the quality of special education to be of poorer quality and less imaginative. Johnson, an eminent scholar, thought special education classes were inferior and negatively impacted personal and social development. Dunn was bothered by the segregation of special education students. He also thought that the diagnosis and identification processes in special education were useless and stigmatizing with labels. Most prominent educators overtly criticized a segregated special education system by the early 1970s (Osgood, 2005).

Mainstreaming became the alternative to segregation between 1968 and 1975 (Osgood, 2005). New approaches, as opposed to segregation, gained favor due to court decisions and legislative action that produced Public Law 94-142 in 1975. Many critics

saw a direct correlation between special education and minority children and poverty-stricken children (Osgood, 2005). Due to the calls for radical education change during the late 1960s and early 1970s, the paradigm shift leaned toward integration-focused and child-centered education.

Wolf Wolfensberger, a strong advocate for the mentally retarded and for institutional reform, popularized the normalization of the educational lives of children and de-institutionalization of special education in the United States (Osgood, 2005). These practices were first developed in Europe.

With the passage of the Education for All Handicapped Children Act (PL 94-142), the integration of exceptional children more fully, which is known as mainstreaming, was pervasive by the mid-1970s (Osgood, 2005). Although California in 1971 took a leadership role in integrated special education programs, the shift toward mainstreaming was unavoidable by 1976.

Between 1977 and 1985, the concept of integration was refined (Osgood, 2005). During the late 1980s and early 1990s, the focus changed from mainstreaming to the Regular Education Initiative (REI). The Regular Education Initiative called for school reform regarding the education of children with disabilities. Margaret Wang, Maynard Reynolds, and Herbert Walberg proposed this initiative with the support of the Reagan administration. The Nation at Risk report of 1983 put the onus of excellence in education on the federal government as it related to coordinating both special and general education alike. In the late 1980s, the Regular Education Initiative precipitated the movement toward complete integration of students with disabilities into the mainstream. The origin of REI is credited to Madeleine Will's call for "a shared responsibility" in an article published in Exceptional Children and a conference in 1985 and to Margaret Wang and

colleagues' "two-part initiative" in the early 1980s (Osgood, 2005, p. 147).

During the early 1990s, inclusion became the appropriate term for integrating special and regular education and it was a controversial issue for the next decade (Osgood, 2005). In 1990, Public Law 94-142 was re-authorized as the Individuals with Disabilities Education Act (IDEA). In 1997, IDEA was again re-authorized.

National Scope of Inclusion

Inclusion is used across the country in both small and large school districts that are rural, suburban, and urban. In some school districts, not all schools, not all grade levels, and not all students with disabilities experience inclusion. Students with disabilities that are designated by Individuals with Disabilities Education Act (IDEA) are conspicuously involved in inclusive practices. Yet, inclusion is relatively new for implementation purposes. As a result, implementation processes and procedures are still evolving. Inclusive program evaluations are also still developing and they focus mainly on special education students. There is a need for continuing staff development in order to cope with inclusive programs. The components of inclusive Individual Education Programs (IEPs) prove still to be very elusive. In addition, inclusive educational programs are facing ambivalence relative to the desired student outcomes. The United States Department of Education strongly supports inclusion and the courts deem inclusion a right for all students. Support for implementing inclusive programs is proliferating among school staff and parents (Lipsky, 1994).

Adapting Curriculum

During 1997 Smith examined the perspectives of an inclusive ninth-grade team consisting of four teachers and a paraprofessional in an urban high school (Keefe & Moore, 2004). She found that teachers in the study used a variety of strategies to adapt

the curriculum and they reported challenging demands that the high school curriculum presented for students with disabilities. Nevertheless, positive academic achievement outcomes have been reported for students with disabilities. Smith concluded that inclusion is a complex phenomenon that needs further study.

High School Challenges

In 2001, Mastropieri and Scruggs suggested that the high school setting presented greater hindrances for co-teaching because of the emphasis on content area knowledge, the need for independent study skills, the faster pacing of instruction, high stakes testing, high school competency exams, less positive attitudes of teachers, and the inconsistent success of strategies that were effective at the elementary level (Keefe & Moore, 2004). Smith (1997) reported that teachers were challenged by the wider gap between students with and without disabilities at high schools. Due to large class sizes, Ellett (1993) suggested that high school teachers might be less willing to accommodate students with learning disabilities. Between 1986 and 1996, the percentage of students with disabilities who were educated in regular classrooms increased by nearly 20 percentage points, whereas, the percentage in resource rooms decreased by almost 15 percentage points. (National Center for Educational Statistics, 1999).

What Makes Inclusion Work?

Research-based programs, practices, and strategies at the highest standards are sought by educational professionals (Strategies to Improve Access to the General Education Curriculum [Strategies to Improve Access], 2005). Although research that is characterized by high quality data and by high quantity positive outcomes is somewhat scarce, findings suggested that specific approaches are effective with particular students.

Exposing students with disabilities to these practices will help them to improve access to the general education curriculum.

The following strategies are supported by significant research: (1) Concrete, Representations and Abstract Sequence of Mathematic Instruction (CRA), (2) Mnemonics, (3) Peer Assisted Learning Strategies (PALS), (4) Literacy Rich Environments, (5) Learning Strategies, (6) Curriculum-Based Measurement (CBM) Assessment, and (7) Functional Behavioral Assessment Systems (Strategies to Improve Access, 2005). CRA can benefit students with disabilities in processing information, attentiveness, and using symbols and abstract mathematical concepts. The concrete phase uses hands-on manipulatives, the representations phase uses pictorial display, and the abstract phase uses numerical symbols or algebraic letters of mathematical concepts. It allows students to move to more complex problem solving and addresses student learning styles. Mnemonics addresses short- and long-term memory challenges, decoding problems, and organizational deficits. This practice improves memory by linking new learning to existing knowledge via visual and verbal cues like keywords, peg words, and acronyms. It also allows encoding of information for later retrieval and better comprehension of content. Peer Assisted Learning Strategies assist students who experience difficulties with decoding and understanding text, aggressive behaviors, attentiveness, and organizational skills. This practice indulges students in structured cooperative learning activities and they support each other through frequent interactions. It promotes meaningful social interactions among students with and without disabilities and it helps with understanding general education content. Literacy-rich environments help students with decoding and comprehending text and help students with lackluster literacy-rich environments outside of school. This approach affords multiple writing and

reading opportunities for students. Reading and writing projects are included throughout the curriculum. Students have numerous opportunities to interact with literacy that is a part of the general education curriculum. Learning strategies entertain difficulty in decoding and understanding text, organizational skills, memory, and problem solving. This practice addresses the cognitive task-specific category like note taking, questioning, and outlining. On the other hand, the metacognitive self-regulation category focuses on goal setting and self-monitoring. It also improves access to the curriculum content by helping students remember key concepts, become independent learners, and become more confident in their academic abilities. Curriculum-based measurement targets children with difficulty in decoding and comprehending text, attentiveness, organizational skills, and mathematical concepts. This assessment practice is a valid curriculum-based assessment. CBM monitors academic progress in basic skills on an ongoing basis. Student progress is measured against self and the class. It involves testing, analysis, and planning. Teachers recognize student weaknesses and they make instructional adjustments in order to meet students' needs. Functional Behavioral Assessment Systems aid students who are characterized by noncompliant behaviors, aggressive behaviors, attention deficits, and communication delays. During this practice, information is gathered through observation in order to create a positive behavioral support plan. Teachers adjust their teaching behaviors and environment to meet the needs of students (Strategies to Improve Access, 2005).

There are some approaches that create schools that do not work. Principles of schools that leave many children behind are (1) demanding compliance and obedience of staff and students; (2) segregating, tracking, and ability grouping; (3) teaching to the middle only instruction; (4) creating a culture of pressure, tension, and competition; (5)

isolating adults and assuring professional turf; and (6) blaming one another (Peterson & Tamor, 2003).

Varied Instructional Settings

In 1996, Douglas Martson examined the academic progress of students with learning disabilities in three instructional settings to determine which produced the greatest academic achievement (Holloway, 2001). One setting was an inclusion model whereby students received instructions in a general education classroom from a regular education teacher and a special education teacher. The second model was a pull-out only model where students received instructions from a special education teacher in a resource room. The third setting provided students with instructions in an inclusion classroom along with periodic instructions in a resource room. Teachers concluded that the combined-service model received the highest rating for student achievement and the inclusion-only model received the lowest rating.

Co-Teaching Effectiveness

According to Zigmond and Magiera in 2001, the major goals of co-teaching and collaboration involve (a) increasing instructional options for students with disabilities, (b) providing the least restrictive environment for students with disabilities, and (c) enhancing the performance of students with disabilities according to Mastropieri et al. (2005). Recent literature reviews on co-teaching concluded that the effectiveness data provided only limited support for the use of co-teaching programs (Mastropieri et al., 2005). Murawski and Swanson (2001) conducted a meta-analysis of co-teaching research and 22 effect sizes were computed on six studies that involved dependent variables such as grades, achievement, attendance, social and attitudinal. The dependent variables yielded a total mean effect size of .40 that suggested a low to moderate average outcome

effect. Murawski and Swanson concluded that additional efficacy research is needed before co-teaching can be generally recommended.

Findings across case studies indicated that co-teaching appeared to be most successful where both teachers practiced effective teaching behaviors (Mastropieri & Scruggs, in press), such as structure, clarity, enthusiasm, maximizing student engagement, and motivational strategies. Not only did effective teaching behaviors lead to increased academic achievement (Mastropieri et al., 1998), these teacher behaviors also led to a greater degree of effective collaboration between the co-teachers. These investigations revealed that academic content knowledge, high-stakes testing, and co-teacher compatibility are the variables that interact strongly with co-teaching success.

Teacher Interviews

Liston (2004) conducted individualized interviews to gain a better understanding of how secondary educators facilitated inclusive education (Villa, Thousand, Nevin, & Liston, 2005). He interviewed 10 general educators and 10 special educators over a 3-week period in a large, urban, southern California multi-cultural and multi-lingual comprehensive high school. Six “best practice” themes emerged from the interviews: (1) administrative support, (2) ongoing professional development, (3) collaboration, (4) communication, (5) instructional responsiveness, and (6) expanded authentic assessment approaches. Most interviewees reported that an administrative team with strong leadership skills is imperative to the success of inclusive practices. Numerous special educators thought that high expectations of all educators should be required and that administrators must hold everyone accountable. All interviewees emphasized the importance of continued professional development. Areas identified for professional development were universal lesson plan design, differential instruction, and methods for

resolving differences. Visitations to other schools were recommended in order to exchange instructional and organizational strategies. Every interviewee reported collaboration among staff members and family as the key to student success. Overwhelmingly, interviewees reported that open communication among the teaching staff provided the foundation of trust needed for teaching partnerships. Instructional responsiveness to the individual learning needs of all students is accomplished when all students are engaged and when students receive multi-modality instruction. Special educators reported an increase in the use of authentic assessment in the general education classroom. They also thought that general educators are looking at the whole child rather than one set of test results (Villa et al., 2005).

Principal Interviews

A. Johnson (personal communication, July 24, 2009), a high school principal, indicated that inclusion is working well for her students. Some teachers at her school are struggling with the new approach because they still feel that the general education teacher should teach and the special education teacher should assist. At her school, students who participate in inclusion are chosen based on their Individualized Education Plans (IEPs), behaviors, and the teaching styles of teachers. In addition, the dynamics of the classes are considered. Counselors, the exceptional children department chairperson, and other exceptional children personnel collaborate to make inclusion decisions. The IEP dictates the time that students spend in general education classes. One challenge is getting teachers acclimated to sharing their classrooms with another teacher. Outside resources, and the training from the exceptional children resource teacher of her district learning community, positively impact the effectiveness of inclusive practices at her school.

L. Bowen (personal communication, July 28, 2009), a high school principal,

reported that inclusion is working well at her school and she thinks that it is a phenomenal process. She said the good training that is provided to general education and special education teachers is the key. She indicated that her special education teachers are on board with inclusion. Her general education teachers are chosen to participate in inclusive classrooms based on their positive response to a survey. Special education students who take regular end-of-course subjects are targeted for participation in inclusion. Advancement Via Individual Determination (AVID) strategies and routine pull-outs have been very effective for inclusion. The principal does not see any real challenges in implementing inclusion. According to this principal, end-of-course test scores and pass rates increased for special education students as a result of inclusive practices in her school.

P. Cauthen (personal communication, July 27, 2009), a high school principal, shared that inclusion is working well at his school. He also indicated that his school is used as a model for inclusion across the country. At his school, he looks for teachers with palatable personalities to co-teach in inclusive classrooms and he has been very successful with that approach. Student IEPs and prior success are considered in placing them in inclusive classrooms. Special education students who take courses with regular end-of-course tests are chosen to participate. The challenges that Cauthen faces at his school are scheduling common planning times and building good relationships especially between new special education teachers. This principal is bothered by how quick students are labeled and he pledged to put some strategies together next year to eradicate this behavior. Picking teacher teams is working very effectively along with decisions on what they teach. In addition, students feel very comfortable interacting with adults. Cauthen has observed a higher promotion rate, less disciplinary issues, and less

stigmatization concerning resource students.

North Carolina School Districts of Interest

"The Green Book" for North Carolina was perused for the 2006-2007 and 2007-2008 school years. The researcher searched for school districts that consistently performed at the top for mean scale scores on end-of-course tests in algebra 1, biology, and English 1. Chapel Hill-Carrboro City, Carteret, Mount Airy City, Watauga, and Wake are the school districts that performed toward the top with high frequency on the aforementioned end-of-course tests. These school districts were contacted to find out what they did for high school special education students.

The director of special education services for Wake County Schools in North Carolina feels that if a special education student is to be taught the standard course of study, he or she has the right to be in general education classes (J. Larson, personal communication, July 27, 2009). Special education students are offered support through (1) modifications, (2) in-class resource training, and (3) curriculum assistance classes. For modification purposes, consultations with teachers are arranged to make them aware of modifications for each student. These teachers are assisted with the necessary student modifications if they need it. For in-class resource training, co-teaching takes place along with training. The director of special education indicated that inclusion was very successful due to this training. In a curriculum assistance class, one of the in-class resource teachers helps students with difficult concepts that special education students did not grasp in the general education class. Training is offered for teachers in curriculum assistance. General education teachers are exposed to the curriculum assistant's roles in regular staff meetings. If modifications and accommodations are needed by high school special education students, they are monitored at a high level.

Direct instruction is provided at the middle schools in reading and math for students who are very low during elective blocks in order to prepare them for high school.

The executive director of curriculum and instruction for Mount Airy City Schools in North Carolina reported that in study skills classes all the questions from students are answered by special education teachers (V. Cameron, personal communication, July 27, 2009). They offer inclusive experiences for students in standardized tests classes. For test-taking strategies, they order Buckle Down and North Carolina Coach books. The ClassScape Assessment System is provided by the state of North Carolina and it is purchased by their school system. According to this central office administrator, this software is closely aligned to the state EOG and EOC tests and it is worth the money invested. Teachers for core academic subjects identify struggling students and they create intervention strategies. For their literacy focus, reading is taught in all core subjects with an interdisciplinary approach.

According to the director of the exceptional children program of Carteret County Public Schools in the Beaufort, North Carolina area, the district targets reading to help high school special education students (D. Sewell, personal communication, July 27, 2009). For struggling readers, the district uses the Reading 180 software program. Very low readers are assisted by the use of the Hill Center Reading Methodology program which is research-based. In order to close the high school gap in reading, they provide early support for elementary and middle school students. Inclusive practices are utilized and the Reading Foundations program is used to train teachers what reading is all about. This Reading Foundations program is a research-based reading program. During the 2009-2010 school year, Carteret County plans to introduce their central office personnel to Math Foundations training. Afterwards, the central office personnel will train their

teachers.

In the Chapel Hill-Carrboro City Schools in North Carolina, they focus on middle school preparation in order to get their students ready for high school (D. Bowling, personal communication, July 27, 2009). According to the assistant superintendent for curriculum and instruction, sixth-grade math is only taught at a very high level for all students because they do not track children in the sixth grade. In the seventh grade, their students take pre-algebra and very few eighth graders do not take algebra 1. Their enrollment has gone up along with their proficiency in math.

In their high schools, algebra 1 classes are small when inclusive practices are used. Double-blocked classes are scheduled for all students in algebra 1. If a student has an Individualized Education Plan (IEP), an academic strategy class for extra support is provided instead of a study hall class. They focus noticeably on algebra 1 in the ninth grade by having an adult monitor their students' progress. Their rationale for this high level monitoring is that students who repeat algebra 1 may be inclined to drop out of school.

High school special education students are given access to general education classes and inclusive environments according to the director of exceptional children program of Watauga County Schools in the Boone, North Carolina area (E. Phillips, personal communication, July 27, 2009). The Language! Program which is a structured reading program is utilized. Their teachers are trained in the Reading Foundations and Language! programs. Reading Foundations is a research-based program. This district also credits their dedicated teachers for their success.

Advantages and Disadvantages of Inclusion

Inclusion has advantages and disadvantages (Inclusion in Schools, 2001). Some

advantages are (1) inclusive classrooms rid special education students of labeling which leads to improved self-esteem; (2) disabled students have competent role models; (3) special education students learn more realistic life skills; (4) disabled students learn how to develop friendships with non-disabled peers; and (5) regular education students have the opportunity to appreciate disabled students and develop sensitivity to their needs. Inclusion also has disadvantages such as (1) disabled students experience lower self-concepts due to lack of acceptance from their non-disabled peers; (2) teachers need to devote more attention to special education students than regular education students; (3) special education students can cause distractions to the education of regular education students; (4) untrained teachers can negatively impact inclusive classes; and (5) teachers who disagree with inclusive practices can choose to sabotage the process. According to LoVette (1996), disabled students experience social gains and regular students gain understanding and appreciation of differences in people and abilities. On the other hand, LoVette shared disadvantages of inclusion such as (1) disabled students would be subject to ridicule; (2) regular teachers would not be prepared and they would have time constraints; (3) teachers would have to divide energies to accommodate disabled students; (4) special education teachers would have to give up ownership of their classroom settings; (5) special education teachers would have to work with regular education teachers with different skills and understandings; (6) the regular education teacher would have to alter curricula and classroom activities; and (7) the regular education teacher would lack training for the inclusive environment.

Models of Inclusion

Four models of inclusion have been successfully executed (Models of Inclusion, n.d.). Wang's Adaptive Learning Environment Model (ALEM) is designed to help all

students learn basic skills and cope socially. It consists of a variety of well-structured activities. For instance, students experience the curriculum at their own pace. The lessons are individually planned by a general education teacher and a special education teacher who collaborate within one classroom. This team teaching model is effective when equal partners plan and evaluate together. According to Walther-Thomas (1996), students with learning disabilities experience improved self-esteem, motivation, and academic performance when ALEM is utilized. The Strategies Intervention Model (SIM) originated at the University of Kansas Center for Research on Learning. This model is based on the belief that students become independent and strategic learners. Students evaluate their own strengths and participate in planning strategies. The final model is the Circle of Inclusion which is used mainly for teaching elementary children. It is characterized by frequent meetings in order to monitor the progress and needs of each student. Teachers utilize team teaching and students work together. Children are self-directed, provided structure, and given the opportunity to choose their own materials and methods.

In the urban North Carolina school district under study, inclusion involves co-teaching between two certified teachers at the high school level. One teacher is a general education teacher who is certified in a particular subject area. The other teacher is a certified special education teacher. They share instructional responsibilities for a single group of students in a single classroom or workspace. There is mutual ownership, pooled resources, and joint accountability. In each inclusive classroom, both teachers have the flexibility to address the unique needs of the students within that classroom.

Inclusion Training Model for Study

The southeastern North Carolina school district, which is the focus of this study,

shared an inclusive practices module with all schools within the system. This module served as a training tool for the use of inclusion within the district at the elementary and secondary levels.

The service delivery option for inclusive practices to be utilized by this district is the co-teaching approach (Co-Teaching Approaches, 2006-2007). Co-teaching was characterized by a particular structure. The curriculum outline was the responsibility of the general education teacher with the help of a pacing calendar and an alignment guide. Planning and instructional delivery were joint efforts on the parts of a general educator and a special educator. The special education teacher handled individual adjustments for students with regard to strategies and accommodations. Co-teachers were to discuss instructional content and format, planning parity, classroom procedures, the discipline plan, student evaluation, teaching chores, feedback, and safety issues. Collaboration was to be accomplished during scheduled common planning time and during student independent tasks.

The co-teaching delivery option included the following approaches: (1) one teach, one observe; (2) one teach, one assist; (3) station teaching; (4) parallel teaching; and (5) alternative teaching (Co-Teaching Approaches, 2006-2007). The one teach, one observe approach afforded more detailed observation of students' participation and behavior. The one teach, one assist approach enabled one person to teach primarily and the other person circulated to give unobtrusive assistance to students. Station teaching allowed the teachers to divide content and students. Each teacher taught one group then repeated to another group. Parallel teaching divided a large group into two groups. Both teachers taught the same information. This approach provided more supervision and opportunities for students to respond. Alternative teaching occurred when one teacher taught a large

group while the other teacher worked with a smaller group. This approach was utilized when a small group needs specialized attention. Team teaching occurred when both teachers taught the same information at the same time. It is called "Tag Team Teaching" because instruction becomes a conversation and not turn taking. Within this school district, it was decided to target courses with standardized end-of-year tests to initiate inclusive practices.

Preparing Secondary Preservice Teachers

The role of special education teachers changed from that of direct instruction to that of facilitator and consultant (Turner, 2003). To cope with this change, it was suggested that special education teachers go through training by visiting other inclusive schools. In a similar fashion, regular education teachers inherited a new role that requires understanding instructional modifications and different disabilities in the classroom. For secondary schools to move to an inclusive model, regular education teachers must also experience staff development. One suggested teacher training strategy was university teacher education programs to enhance the knowledge base and performances of preservice teachers before they reach the classroom. Another strategy was to require introductory level special education courses for preservice and in-service teacher recertification. One required course appeared to positively impact the instructional competencies of preservice teachers. Merging regular and special education into one program has been developed in several areas of the country. The programs focused on educating all children and their diverse needs. Finally, the dual certification option in regular elementary and special education has gained popularity. Unfortunately, the focus to revamp teacher education has been on the elementary level, although inclusive practices are also used at the secondary level.

Inclusion in Elementary Schools

In 1998, Nancy Waldron and James McLesky compared the academic gains between elementary students with disabilities who were in inclusion programs and those elementary students with disabilities who were not in inclusion programs. In reading, they found that more students with mild learning disabilities made academic gains comparable to their nondisabled peers when they participated in inclusive programs. In mathematics, they found that the inclusion or noninclusion setting did not impact the proportion of mild or severe learning disabled students who made academic gains comparable to their grade-level peers. Earlier researchers found that the differences in academic achievement among students with mild learning disabilities were not significant when they were in inclusive or noninclusive settings (Holloway, 2001).

A study was conducted in a Southeast school district that featured elementary grades. General education and special education teachers collaborated in planning Individual Education Programs and team teaching took place in general education classrooms. These teachers desired more collaborative planning time. As one teacher taught, the other teacher helped students with special needs (Daam, Beine-Smith, & Latham, 2001).

Teachers and principals indicated that pull-out services were still needed for some students. They agreed that the general education teachers are not prepared to work with disabled students. General education teachers, especially, had the challenges of adapting the curriculum to meet the needs of students with disabilities when they performed several years below grade level. All parties also agreed that the students with disabilities improved socially when the inclusion model was used. Principals thought the students with disabilities grew by being around other students with various ability levels. Parents

felt that the self-esteem of their disabled children was enhanced by inclusive practices. Finally, teachers and administrators in this study felt strongly about the social benefits of including students with disabilities, but they experienced ambivalence about the academic success of included students (Daam et al., 2001).

Inclusion in Middle Schools

According to Walther-Thomas (1997) most middle schools are structured for professional collaboration which is a crucial component for successful inclusion (What is the Impact of Inclusion on Students and Staff in the Middle School Setting [What is the Impact of Inclusion], 1999). Walther-Thomas indicated that interdisciplinary teaming undergirds the effective middle school organization. Interdisciplinary teams enable the same group of teachers to work with the same group of students. This allows the team to furnish the best learning environment for each student in the group. In 1997, Pearpoint and Forest concluded that early adolescents are very preoccupied with belonging (What is the Impact of Inclusion, 1999). When early adolescents are able to interact with others, they have the feeling of belonging.

Inclusion is credited with causing better social behavior among students with disabilities due to higher expectations (Hines, 2001). In addition, inclusion is thought to cause better acceptance of students with disabilities. At the same time, current research on the effectiveness of inclusion has been inconclusive (Hines, 2001).

The three barriers to inclusion are organizational, attitudinal, and knowledge (Hines, 2001). Organizational barriers include collaborative planning time, staffing, and management strategies. Attitudinal barriers include lack of confidence in working in inclusive settings and resistance to new ideas about teaching and learning. From a knowledge standpoint, regular education teachers feel that they are not prepared to work

with the needs of special education students. On the other hand, special education teachers do not feel comfortable with the subject content.

Promoting Inclusion in Secondary Classrooms

Inclusion gained favor in recent years (Mastropieri & Scruggs, 2001). A noticeable number of students with disabilities are served in the regular education classrooms. They benefit from exposure to the general education curriculum. On the other hand, the challenge is creating the relationships that exist in the elementary classrooms. As a result of a 3-year study, it was discovered that successful inclusive classrooms are characterized by (1) administrative support, (2) special education personnel support, (3) positive classroom environment, (4) suitable curriculum, (5) effective pedagogical skills, (6) peer tutoring, and (7) disability-related teaching strategies (Mastropieri & Scruggs, 2001).

Secondary Corrective Reading Programs

Effective reading programs can positively impact the participation of special education students in inclusive settings. Although traditionally used for remedial or special education programs, reading courses are emerging in middle and high schools (Slavin, Cheung, Groff, & Lake, 2008). Due to the lack of comprehensive research, effective secondary reading programs are somewhat elusive. Nevertheless, the search for programs that increase reading achievement produced four categories: (1) reading curricula, (2) mixed-method models, (3) computer-assisted instruction, and (4) instructional-process programs. Reading curricula make use of innovative textbooks and curricula. The mixed-method categories combine large and small group instruction, computer activities, and individualized instruction. Computer-assisted instruction models utilize technology to enhance reading achievement. Instructional-process programs

provide professional development for teachers in order to expose them to effective strategies for teaching reading. These programs target cooperative learning, strategy instruction, and comprehensive school reform.

Most reading programs that showed signs of efficacy were based on cooperative learning (Slavin et al., 2008). These programs allowed students to work in small groups to help each other master reading skills. The success of the team was contingent on the individual learning of each team member. Positive results were also found in mixed-method models. Similar to cooperative learning, these approaches focus on improving classroom instruction.

According to these findings, student achievement is most positively impacted by approaches that change what teachers and students do daily in the classroom (Slavin et al., 2008). Both cooperative learning and mixed-method approaches qualify. Yet, more research is needed for reading programs at the secondary level.

Response to Intervention Strategies

Both the Individuals with Disabilities Education Act of 2004 (IDEA) and No Child Left Behind Act of 2001 (NCLB) favor interventions and research-based instruction (Intervention Strategies Guide, 2005). They also encourage efficacious reading and behavior programs that improve student performance. When using a Response to Intervention (RTI) approach, identifying struggling students early and utilizing the correct interventions consistently will help to close learning gaps in a timely manner.

According to research, sound instructional practices positively impact teaching and learning (Intervention Strategies Guide, 2005). Some of the beneficial practices include feedback, cooperative grouping, games and simulations, homework and practice,

questions, and organizers. When timely feedback addressed student errors, student learning increased significantly. According to Marzano, Pickering, and Pollock (2001), cooperative grouping conspicuously improved student learning when teachers used heterogeneous grouping at least once a week. Other researchers have credited cooperative learning for student achievement, time on task, motivation, and transfer of learning. Games and simulations motivated students intrinsically to cause more engagement according to Hood (1997). Edelson (1998) reported that games and simulations helped students discover knowledge through exploration. Neubecker (2003) found that games and simulations stimulated teamwork, cooperation, and conflict resolution. Gordon and Pea (1995) proclaimed extension of learning due to simulations. Marzano et al. (2001) reported increased student comprehension when they visualized and modeled concepts. Homework should be assigned according to the needs of the students and practice should be on skills already taught. According to Healy (1990), students should practice a few skills at a time pervasively. Complex learning should be broken down into smaller parts (Marzano et al., 2001). Research indicated that teachers increased student academic achievement by asking higher-level questions that related to content and caused analytical processing. Graphic organizers helped to reinforce concepts, enhance understandings, and expand the modes of content presentation.

Differentiation of Instruction

Mixed-ability classrooms require teachers to exceed a single approach for everyone (Tomlinson, 2001). Differentiated instruction answers this call. Differentiated instruction provides varied ways of acquiring content, processing concepts, and developing products for effective learning by each student. In effective differentiated classrooms, students are flexibly grouped by ability and are exposed to different group

arrangements and working groups over time. This proactive approach is designed to address the learning needs of a range of learners. Teachers focus on assessment in order to better match their instructions with particular student needs.

Differentiated instruction renders varied approaches to content, process, and product (Tomlinson, 2001). Content is teacher input or what students learn. Process is how students make sense of information. Product is output or how students demonstrate mastery of content.

Students are at the center of differentiated instruction (Tomlinson, 2001). Learning experiences are thought to be more effective when they are engaging, relevant, and interesting to students. Teachers in mixed-ability classrooms challenge all of their students at the optimal level. They allow their students to be involved in decision making and students share responsibility for their learning. For common understandings and a sense of community, it is sometimes more efficient for teachers to blend whole-class, group, and individual instructions within differentiated instruction. Teachers choose to continue to learn about their students and they make changes as needed. As teachers continue to seek a better match between their teaching and the learner, differentiation is considered a way of life in their classrooms.

The purpose for differentiated instruction in mixed-ability classrooms focuses on the idea that each student must make meaning of what is being taught. This meaning is impacted by the student's prior understandings, interests, beliefs, learning style, and the student's attitudes about self and school (National Research Council, 1990). For educational planning, the guide should be that you cannot reach the mind that you do not engage. Maximizing student capacity is the primary goal of differentiated instruction. Activities that are relevant, that focus on big ideas and key concepts, and that entertain

students' learning profiles (learning styles and intelligence preferences) positively impact students' success. In other words, student characteristics such as readiness, interests, and learning profile can be used to differentiate content, process, and product. Content can be differentiated based on a student's readiness, interests, and learning profile. Process can be differentiated based on a student's readiness, interests, and learning profile. Lastly, product can also be differentiated based on a student's readiness, interests, and learning profile (Tomlinson, 2001).

Gender-Specific Classrooms

In 1998, the American Association of University Women reported that a good education was the key, not whether a school is single-sex or coeducational (Sharpe, 2000). This report indicated that there is no evidence that single-sex classes work better for girls than coeducational classes. Although single-sex classes have shown promising results for girls in mathematics and science classes, there has not been significant improvement in girls' achievement.

The future of single-gender classes appears to be contingent on the much needed additional research about the efficacy of these classes (Sharpe, 2000). Nevertheless, the California Department of Education reported that single-gender educational research suggests that these type classes (1) appear to reduce dropouts, (2) improve academic performance of urban males, (3) increase academic achievement of girls in math and science, (4) alleviate distractions between boys and girls, and (5) motivate students and parents.

In June 2005, researchers at Cambridge University released the results of a 4-year study on gender differences in education (Single-Sex vs. Coed: The Evidence, 2008). Fifty schools were involved in this study and single-sex education was one of the

strategies. It was discovered that the single-sex classroom strategy increased boys' academic performance in English and foreign languages and it improved girls' performance in math and science.

Cornelius Riordan, a professor of sociology at Providence University in Rhode Island, reported studies in the 1980s and 1990s about outcomes of graduates of Catholic schools in the United States (Single-Sex vs. Coed: The Evidence, 2008). He found that girls in single-sex schools consistently outperformed girls at coeducational schools. In addition, he concluded that the beneficial effects of single-sex schooling for boys were smaller than for girls although other researchers suggested just the opposite. In a similar study, University of Michigan researchers compared graduates of Catholic single-sex and coeducational high schools. Boys in single-sex high schools scored better in reading, writing, and math than boys at coeducational high schools. Girls at single-sex schools did better in science and reading than girls in coeducational schools. As a result, these researchers concluded that students at single-sex schools had superior academic achievement.

On October 25, 2006, the United States Department of Education published new regulations allowing coeducational public schools to offer single-sex classes (The Gurian Institute, n.d.). The regulations required schools that offered single-sex classes to provide (1) a rationale for offering a single-sex class in a specific subject, (2) a coeducational option in the same subject, and (3) a bi-annual review to determine if the rationale is still viable.

According to the Gurian Institute, single-sex schooling help boys and girls by creating a gender-friendly environment, by allowing teachers to deliver gender-friendly curriculum strategies, by creating a comfortable place for asking questions for both boys

and girls, by giving girls the opportunity to develop leadership skills, by removing the distractions of the opposite sex, and by breaking down gender stereotypes.

Summary

The foregoing information has described research findings relevant to inclusion teaching methodologies, resource teaching methodologies, and high school special education students' academic achievement. Research is scarce concerning the use of inclusive practices at the secondary school level. Before inclusion, specially trained special education teachers taught students with disabilities in separate resource rooms (pull-out programs) according to their individual or small group needs. Students with disabilities have experienced isolation, integration, mainstreaming, the Regular Education Initiative, and inclusion, respectively, in the history of the United States. Inclusive practices are used across the country in rural, suburban, and urban school districts. There are fewer inclusive programs at the secondary level. The implementation of inclusive programs is still evolving. Increasing numbers of special education students are being accommodated in regular classrooms via the collaboration of regular education teachers and special education teachers. Significant research supports inclusion strategies such as (1) Concrete, Representations, and Abstract Sequences of Mathematic Instruction (CRA), (2), Mnemonics, (3) Peer Assisted Learning Strategies (PALS), (4) Literacy Rich Environments, (5) Learning Strategies, (6) Curriculum-Based Measurement Assessment, and (7) Functional Behavioral Assessment Systems. Zigmond and Magiera (2001) reported that the goals of co-teaching and collaboration involved (a) increasing instructional options for students with disabilities, (b) providing the least restrictive environment for students with disabilities, and (c) enhancing the performance of students with disabilities. Case studies of secondary schools indicated that co-teaching appears to

be most successful when both teachers exhibit teaching behaviors such as structure, clarity, enthusiasm, maximizing student engagement, and motivational strategies. After interviewing 10 general educators and 10 special educators in southern California, six "best practice" themes for successful inclusion emerged. They were (1) administrative support, (2) ongoing professional development, (3) collaboration, (4) communication, (5) instructional responsiveness, and (6) expanded authentic assessment approaches. Three principals from the targeted school district of this study exert noticeable energy toward selecting the right combination of co-teachers for inclusion and toward their training. Most of these interviewed principals attributed higher EOC scores and promotion rates and less disciplinary issues to inclusive practices. Reading interventions have been the common focus of five successful North Carolina school districts for algebra 1, biology, and English 1 end-of-course test results. The use of inclusive practices has both advantages and disadvantages. Four successful models of inclusion were compared. Co-teaching is the service delivery option for inclusion that was chosen by the school district that is the focus of this study. Staff development is strongly recommended for preservice regular education and special education teachers. In a study, inclusion in elementary schools increased the proportion of students with mild learning disabilities who experienced gains in reading comparable to their nondisabled peers. The use of inclusion in the middle schools faces some of the same advantages and disadvantages as in high schools. The use of inclusive practices is on the rise and these practices can be successful with the proper support. According to research findings, the most effective secondary corrective reading programs change what teachers and students do daily in the classroom and they also incorporate cooperative learning and mixed-methods approaches. Response to Intervention strategies identify struggling students early and utilize the

appropriate interventions consistently to close learning gaps in a timely manner. Student characteristics such as readiness, interest, and learning profile can be tapped to differentiate content, process, and product. Researchers at Cambridge University reported, after a 4-year study, that single-sex classes improved boys' performance in English and foreign languages and improved girls' performance in math and science.

Chapter 3: Methodology

Problem to be Addressed

High school special education students lagged behind regular education students throughout an urban North Carolina school district on end-of-course tests performance. In addition, pressures of increased accountability from the state of North Carolina and the federal government caused school districts to focus on all subgroups. With the aforementioned information in mind, the purpose of this research study was to determine the impact of the inclusion teaching methodology on the academic achievement of high school special education students. To accomplish this goal, the average mean scale scores on end-of-course tests of a control group (resource methodology) of high school special education students was examined along with the average mean scale scores on end-of-course tests of an experimental treatment group (inclusion methodology) of high school (9^{th}-12^{th} grade) special education students.

Research Questions

In a cluster sample of three traditional high schools that were randomly selected from seventeen high schools within an urban North Carolina school district, all special education students who experienced the resource teaching methodology and the inclusion teaching methodology were studied to answer the following questions:

1. How does inclusion impact high school special education students' academic achievement outcomes as measured by biology, algebra I, and English I as a function of gender, ethnicity, and years of inclusion?

2. What generalizations with confidence can be made about the use of inclusion methodology in high schools within an urban North Carolina school district as measured by end-of-course test scale scores?

Research Design

This quantitative study is a time-series design with a random sampling from a list of 17 traditional North Carolina high schools that have existed for at least 7 years in a southeastern school district. The design allowed the researcher to look for a trend or pattern in the academic achievement of high school special education students who experienced the resource teaching methodology and those students who experienced the inclusion teaching methodology over 3 consecutive years, respectively. This study design also allowed the researcher to examine generalizations with confidence about the use of inclusion teaching methodology. In addition, the research design enabled the researcher to examine the significance of any difference in average mean scale end-of-course test scores for high school special education students who experienced both inclusion and resource teaching methodologies.

The group of students who experienced 3 consecutive years in the resource classroom was used for baseline data. Subsequently, the experimental group of students who experienced the inclusion classroom became the main focus of this study. In the resource model, a special education teacher teaches special education students in a resource classroom (pull-outs) (Holloway, 2001). When the inclusion model was used, a special education teacher and a regular education teacher collaborate in the same classroom that consists of both special education and regular education students (Holloway, 2001).

The independent variable was the teaching methodology and the dependent or outcome variable was academic achievement.

Procedures

The targeted population was all high school (Grades 9-12) special education

students who attended the 17 high schools in the urban North Carolina school district. The cluster sample was taken of all special education students from schools in existence from 2002 to 2009. End-of-course test data from the resource methodology covered school years 2002-2003 to 2004-2005. End-of-course test data from the inclusion methodology covered school years 2006-2007 to 2008-2009 because high school inclusion classes within this district began officially after the 2005-2006 school year. A random cluster sample consisting of three high schools included the school years from 2002 to 2009.

End-of-course test scores were collected for students who experienced resource-only teaching strategies from 2002-2003 to 2004-2005 school years for the three randomly selected high schools. On the other hand, end-of-course test data from special education students who experienced inclusive practices were collected from the 2006-2007 to 2008-2009 school years for the same three high schools. After collecting all of the data, the researcher examined the performances of the control (resource) and the experimental (inclusion) groups by using a statistical test of significance.

Sampling Methods

An urban North Carolina school district which is the focus of this study officially began the use of the inclusion teaching methodology at the beginning of the 2006-2007 school year. Among the three randomly selected high schools that participated in the study, all special education students who met the requirements (9^{th}-12^{th} graders) of the study made up the cluster sample. The first 3 consecutive years of the study examined the results of using the resource teaching model and the subsequent 3 consecutive years that began 2006-2007 examined the results of using the inclusion teaching model.

Data Collection Procedures

In this quantitative research study, the collection of end-of-course test scale scores, as measures of academic achievement outcomes for high school special education students, was the source of data collection. Archival data was used for the purpose of this research. The researcher submitted an application along with an approved proposal to the urban North Carolina school district's Instructional Accountability Department in order to access the necessary data. Subsequent permission to secure this end data was granted by the superintendent of the school district or his designee.

Data Analysis Procedures

For analysis of the data, the mean scale scores from EOC tests were computed each year of the study for the sample from each school of high school special education students who experienced the resource teaching methodologies and those students who experienced the inclusion teaching methodologies. Secondly, the 3-year average mean scale scores from EOC tests were computed for the control group (students taught by resource methods) and the experimental group (students taught by inclusion methods) for the three schools individually and collectively. The researcher compared the average mean scores of the three schools individually and collectively for 3 years to determine positive or negative changes due to inclusion. An analysis of variance (ANOVA) was conducted for the effect of longevity in the inclusion program. ANOVA is a procedure for determining whether the difference between the mean scores of two or more groups on a dependent variable is statistically significant. The three schools were compared by an ANOVA to see if there were differences by school for the 3 years of resource-only teaching methodology. Since there were differences between the schools, an ANOVA was done by school, gender, and ethnicity. As a result, data were analyzed by gender,

ethnicity, and years of inclusion for the three schools. Computing the percentage point gaps in the various proficiency levels for corresponding years of resource and inclusion teaching methodologies answered the question about the impact of inclusion on high school special education students' academic achievement outcomes within the cluster sample. The researcher could not examine the difference in average mean scale scores between 3 years of resource and 3 years of inclusion due to the re-norming of the North Carolina English 1, biology, and algebra EOC tests.

A 95% confidence interval was utilized at the $\alpha = 0.05$ significance level in order to examine the significance of the difference, if any, in the average mean scale EOC test scores between special education students from resource classrooms and those from inclusive classrooms. The end-of-course test scale scores represented continuous scores on the two groups. Calculation of confidence limits and ANOVA gave power to the test of statistical significance (Gall, Gall, & Borg, 2003). Computing the statistical significance answered questions about making generalizations with confidence about inclusion methodology and the significance of any differences in the average mean scale scores from EOC tests for the two groups within the cluster sample.

The control (resource) data encompassed the 3 consecutive school years that represented baseline data. They are the 2002-2003, 2003-2004, and 2004-2005 school years. During these years, the group of high school special education students did not receive the treatment of inclusion. The experimental treatment (inclusion) data embraced the 2006-2007, 2007-2008, and 2008-2009 school years because inclusion was official in this district after the 2005-2006 school year. The outcomes from the experimental treatment (inclusion) were the basis for this study.

Instrument

North Carolina end-of-course tests were the data-collecting instruments to examine the impact of inclusive practices on students' academic achievement outcomes for this quantitative research study. According to a North Carolina Department of Public Instruction technical reports website, the end-of-course test documents are criterion-referenced tests with reliability coefficients that are greater than 0.85 and the state goal is at least 0.85 for measures of internal-consistency reliability. On the other hand, the validity of the tests that encompass content, criterion-related, and construct validities is at an ideal level. The North Carolina end-of-course tests for English I, biology, and algebra 1 are at levels of reliability and validity that make them useful for internal stability and content relevance purposes, respectively.

Delimitations of the Study

1. This study focused only on high school special education students within one school district.

2. The study targeted only three courses with end-of-course tests.

3. The trend longitudinal nature of the study alleviated the need to follow a cohort of students as samples.

4. The study controlled for the use of the resource instructional methodology by also utilizing special education teachers for the inclusion methodology.

Limitations of the Study

1. The levels of regular education teacher and special education teacher collaboration can be problematic.

2. The participating teachers' attitudes toward the use of inclusive practices can become an obstacle.

3. The extent of generalization of results to high schools beyond one school district narrows the targeted population for the study.

4. The longitudinal nature of the study can make data collection a challenge.

5. There is limited research on the use of inclusive practices at the high school level.

6. The skill levels of participating teachers could vary noticeably.

7. The assumption that quality teaching is occurring throughout the study.

8. This is a look at groups of students for trends and not individuals.

Timeline

Concept paper completed (August 2006)

Final proposal approval for data collection (May 2009)

Initial data collection (August 2009)

Final data collection and analysis (February 2010)

Draft report (March 2010)

Final report (April 2010)

Summary

The purpose of this quantitative research study is to determine if the use of inclusion teaching methodology impacts the academic achievement of high school special education students. These students lagged behind regular education students on end-of-course tests proficiency within an urban North Carolina school district. If this challenge is to be addressed, new teaching strategies must be implemented. This study is an attempt to discover those strategies that will positively impact the academic achievement of high school special education students within this urban North Carolina school district.

Chapter 4: Results of the Study

Introduction

The purpose of this study was to determine the impact of inclusion on the academic achievement of high school special education students as measured by end-of-course test scale scores. In addition, the purpose of this study was to produce generalizations with confidence that can be made about the use of inclusive practices in an urban North Carolina school district. This study examined the impact on academic achievement when using the inclusion and the resource teaching methodologies within three different high schools of the same school district. Using North Carolina end-of-course tests, the following research questions were answered.

1. How does inclusion impact high school special education students' academic achievement outcomes as measured by biology, algebra 1, and English 1 as a function of gender, ethnicity, and years of inclusion?

2. What generalizations with confidence can be made about the use of inclusion methodology in high schools within an urban North Carolina school district as measured by end-of-course test scale scores?

Description of the Sample

The targeted population for this study was all high school (Grades 9-12) special education students who attended the 17 traditional high schools in an urban southeastern North Carolina school district. A cluster sample was taken from 17 traditional North Carolina high schools that existed for at least 7 years (2002-2009) in the urban southeastern school district. From the 17 traditional North Carolina high schools, 3 high schools were randomly selected to participate in this study. All high school special education students who met the requirements of the study made up the cluster sample.

The first 3 consecutive years of the study examined the results of using the resource teaching methodology and the subsequent 3 consecutive years after 2005-2006 examined the results of using the inclusion teaching methodology. Inclusive practices within the high schools of this school district began officially during the 2006-2007 school year.

Analysis of Data

The statistical analysis for the two research questions tested the impact of the inclusion teaching methodology on the academic achievement of high school special education students and the generalizations that can be made about the use of inclusive practices within an urban North Carolina school district. Teaching methodologies represented the independent variables and academic achievement as measured by end-of-course test scale scores represented the dependent variable. In research question one, the impact of inclusion teaching methodology on academic achievement as a function of gender, ethnicity, and years of inclusion was examined. Research question two examined the generalizations with confidence that can be made about the use of inclusive practices within an urban North Carolina school district. Due to the re-norming of the North Carolina end-of-course tests used in the study, the researcher used the percentage of students at each proficiency level for each school and course instead of the average mean scale scores to answer research question one. In addition, an analysis of variance (ANOVA) was conducted to see if differences existed by school for 3 years of resource-only teaching and an ANOVA was conducted to see the effect of longevity in the inclusion program. Afterwards, an ANOVA was done by school, gender, and ethnicity. For research question two, a 95% confidence interval was used to determine generalizations with confidence about the utilization of inclusion. A single group t-test was abandoned due to the negative impact of re-norming the end-of-course tests on the

significance of any difference in average mean scale scores between students from resource and inclusion classrooms over 3 years.

Research Question 1

How does inclusion impact high school special education students' academic achievement outcomes as measured by biology, algebra 1, and English 1 as a function of gender, ethnicity, and years of inclusion?

Biology

Table 4 displays the mean scale EOC scores for biology for each school during a particular school year. The mean scale scores changed beginning in the 2007-2008 school year for all schools due to the re-norming of the EOC tests. This fact negatively impacted the researcher's ability to compare the average mean scale scores for each school and for all schools during resource and inclusion years.

Table 4

Biology Scale Scores by School by Year

School	School Year	Mean	N	Standard Deviation
East	2002-2003	46.08	38	9.054
	2003-2004	48.32	62	8.172
	2004-2005	50.58	36	8.416
	2006-2007	52.00	6	5.762
	2007-2008	144.67	12	10.138
	2008-2009	145.90	20	8.705
North	2002-2003	49.05	37	8.390
	2003-2004	47.75	44	8.444
	2004-2005	52.43	65	7.546
	2006-2007	51.95	37	6.137
	2007-2008	143.68	22	8.002
	2008-2009	145.93	15	7.275
West	2002-2003	44.57	47	4.257
	2003-2004	44.31	55	6.669
	2004-2005	45.94	47	6.825
	2006-2007	47.20	20	4.980
	2007-2008	140.88	33	8.306
	2008-2009	142.06	36	8.789

Table 5 delineates biology proficiency of schools by school years. As the years of inclusion increase, there was a trend of increases in level 3 proficiency across all schools.

Trends for level 4 proficiency were elusive due to insufficient data during inclusion years.

Table 5

Biology Proficiency by School by Year

	Proficiency Levels								
	1		2		3		4		Total
	N	%	N	%	N	%	N	%	N
2002-2003 East	76	16.27	150	32.12	185	39.61	56	11.99	467
North	68	10.56	138	21.43	309	47.98	129	20.03	644
West	182	48.15	149	39.42	42	11.11	5	1.32	378
2003-2004 East	116	17.63	208	31.61	253	38.45	81	12.31	658
North	102	14.35	158	22.22	274	38.54	177	24.89	711
West	160	46.24	127	36.71	54	15.61	5	1.45	346
2004-2005 East	58	10.96	167	31.57	226	42.72	78	14.74	529
North	71	8.38	195	23.02	401	47.34	180	21.25	847
West	126	29.93	177	42.04	105	24.94	13	3.09	421
2006-2007 East	1	16.70	4	66.70	1	16.70			6
North	5	13.50	21	56.80	9	24.30	2	5.40	37
West	9	45.00	10	50.00	1	5.00			20
2007-2008 East	4	33.30	2	16.70	6	50.00			12
North	6	27.30	6	27.30	10	45.50			22
West	13	39.40	13	39.40	5	15.20	2	6.10	33
2008-2009 East	4	20.00	5	25.00	10	50.00	1	5.00	20
North	2	13.30	4	26.70	8	53.30	1	6.70	15
West	15	41.70	11	30.60	8	22.20	2	5.60	36

Table 6 depicts the biology proficiency levels by school years. The percentage of

students at level 3 increased 19.7% points (36.6% minus 16.9%) after 3 years of the inclusion years. Level 4 proficiency percent was somewhat steady after year 3 of the inclusion years.

Table 6

Biology Proficiency Levels by School Year

	Proficiency Levels								
	1		2		3		4		Total
	N	%	N	%	N	%	N	%	N
2002-2003	68	55.7	35	28.7	18	14.8	1	.8	122
2003-2004	94	58.4	43	26.7	21	13.0	3	1.9	161
2004-2005	51	34.5	63	42.6	25	16.9	9	6.1	148
2006-2007	15	23.8	35	55.6	11	17.5	2	3.2	63
2007-2008	23	34.3	21	31.3	21	31.3	2	3.0	67
2008-2009	21	29.6	20	28.2	26	36.6	4	5.6	71

Table 6 shows positive gaps of 2.7% points, 18.3% points, and 19.7% points favoring inclusion at level 3 when 3 years of resource teaching methodology were compared with 3 corresponding years of inclusion. Level 4 gaps were positive for inclusion at 2.4% points and 1.1% points for the first 2 comparison years with resource. For the third years of resource and inclusion, there was a negative gap of 0.5% points for inclusion at level 4. When students performed at proficiency levels 3 and 4, they were considered to be at grade level (proficient). The percentages of students at grade level were 15.6, 14.9, and 23.0, respectively, for the 3 years of resource teaching methodology. For the inclusion years, the percentages of students at grade level were 20.6, 34.3, and

42.3, respectively. These figures were obtained by adding the level 3 percentage to that of level 4. This means that 79.4%, 65.6%, and 57.8% were not at grade level, respectively, for the inclusion years. From a grade-level perspective, the gaps are 5.0% points, 19.4% points, and 19.3% points, respectively, favoring inclusion when 3 corresponding years of resource and inclusion teaching results were examined. However, the researcher noticed that the number of participants during the resource years doubled the number of participants during the inclusion years in most instances. And the third year of inclusion yielded 42.2% proficient students and the third year of resource produced only 23.0% proficient students in biology. This 42.2% proficiency was higher than any given year of resource percentage proficient.

When the effect of longevity in the inclusion program for biology was examined, the proficiency gaps were positive at 13.7% points and 8.0% points, respectively, between year 1 and 2 and between year 2 and year 3 of inclusion. Resource proficiency gaps were a negative 0.7% points and a positive 8.1% points for the corresponding time intervals. Both inclusion gaps were positive and the percentage of students who were proficient increased every year in the inclusion program. Resource years produced mixed results with a decline in the percentage of students who were proficient for the second year and an increase in proficient students (levels 3 and 4) for the third year.

Table 7 shows the biology proficiency levels for all schools during the resource school years (2002-2005). The highest percentage of students were at level 1 (49.4 %) followed by level 2 at 32.7%. The percentage of students who were proficient in biology for all schools was 17.9 during the resource years.

Table 7

Biology Proficiency Levels For Resource Years

	1		2		3		4		Total
	N	%	N	%	N	%	N	%	N
Biology Level	213	49.4	141	32.7	64	14.8	13	3.0	431

Table 8 delineates biology proficiency levels for all schools during the inclusion school years (2006-2009). The percentage of students at level 2 was at a high of 37.8% and followed by level 1 (29.4%) and by level 3 (28.9%). Level 3 percentages increased from 14.8% for resource years to 28.9% for inclusion years. The percentage of students who were at grade level in biology for all schools was 32.8 during the inclusion years. This compared to 17.9% students at grade level during resource years and it was a gap of 14.9% points favoring inclusion.

Table 8

Biology Proficiency Levels For Inclusion Years

	1		2		3		4		Total
	N	%	N	%	N	%	N	%	N
Biology Level	59	29.4	76	37.8	58	28.9	8	4.0	201

Table 9 shows the analysis of variance (ANOVA) to indicate differences by school, if any, for biology. The table supports the idea that there was a significant difference between the three schools for biology. As a result, the null hypothesis was rejected because the significance was less than the predetermined alpha level of 0.05.

Table 9

Analysis of Variance for Resource Years (Biology Mean Scale Score)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2096.445	2	1048.223	17.738	.000
Within Groups	25292.975	428	59.096		
Total	27389.420	430			

Table 10

Biology Scale Score Confidence Intervals (Resource Years)

Scheffe

(I) schnum	(J) schnum	Mean Difference (I-J)	Std. Error	Sig.	95% Conf. Interval	
					Lower Bd.	Upper Bd.
North	West	5.258*	.895	.000	3.06	7.46
	East	1.870	.916	.126	-.38	4.12
West	North	-5.258*	.895	.000	-7.46	-3.06
	East	-3.388*	.912	.001	-5.63	-1.15
East	North	-1.870	.916	.126	-4.12	.38
	West	3.388*	.912	.001	1.15	5.63

*The mean difference is significant at the 0.05 level.

Table 11

Biology Scale Score Homogeneous Subsets (Resource Years)

Scheffe

Schnum	N	Subset for alpha = 0.05	
		1	2
West	149	44.91	
East	136		48.29
North	146		50.16
Sig.		1.000	.121

In Table 11 the means for groups in homogeneous subsets are displayed. The harmonic mean sample size was 143.447. Since the group sizes were unequal, the harmonic mean of the group sizes was used. Type 1 error levels were not guaranteed.

Table 12 shows the ANOVA to delineate the difference between schools, if any, for biology during inclusion years. The table supported that the difference between schools is significant because the significance level of .000 is less than the predetermined alpha level of 0.05.

Table 12

Analysis of Variance for Inclusion Years (Biology Mean Scale Score)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	32418.605	2	16209.302	9.107	.000
Within Groups	352415.614	198	1779.877		
Total	384834.219	200			

Table 13

Biology Scale Score Confidence Intervals (Inclusion Years)

Scheffe

(I) schnum	(J) schnum	Mean Difference (I-J)	Std. Error	Sig.	95% Conf. Interval	
					Lower Bd.	Upper Bd.
North	West	-22.033*	6.637	.005	-38.40	-5.66
	East	-32.414*	8.420	.001	-53.18	-11.65
West	North	22.033*	6.637	.005	5.66	38.40
	East	-10.381	8.175	.448	-30.54	9.78
East	North	32.414*	8.420	.001	11.65	53.18
	West	10.381	8.175	.448	-9.78	30.54

*The mean difference is significant at the 0.05 level.

Table 14

Biology Scale Score Homogeneous Subsets (Inclusion Years)

Scheffe

Schnum	N	Subset for alpha = 0.05	
		1	2
North	74	98.27	
West	89		120.30
East	38		130.68
Sig.		1.000	.413

Table 14 displays means for groups in homogeneous subsets. The harmonic mean sample size was 58.748. Since group sizes were unequal, the harmonic mean of group sizes was used. Type 1 error levels were not guaranteed.

Tables 15 and 16 display the male and female gender proficiencies for biology. All three schools and both resource and inclusion school years were included.

Table 15

Male Percent Proficient in Biology for All Schools

School Year	Level 1	Level 2	Level 3	Level 4	Total
2002-2003	53.0%	26.5%	19.3%	1.2%	83
2003-2004	56.6%	23.6%	17.9%	1.9%	106
2004-2005	35.1%	39.2%	18.6%	7.2%	97
2006-2007	16.7%	61.9%	19.0%	2.4%	42
2007-2008	28.3%	28.3%	41.3%	2.2%	46
2008-2009	25.5%	23.4%	44.7%	6.4%	47

For year 3 of resource methodology, male student proficiency percent was 25.8% and year 3 of inclusion was 51.1%. This was almost twice the percent proficient (25.8%) for the third year of resource and it is higher than any year of resource. Every successive year of inclusion produced increases in the percent of proficient male biology students. Only the third year of resource produced an increase in the percent proficient. However, the number of participants for inclusion years was about half of the number of participants for the resource years. The male students' biology percent proficient were 21.4%, 43.5%, and 51.1% for years 1, 2, and 3 of inclusion, respectively.

Table 16

Female Percent Proficient in Biology for All Schools

School Year	Level 1	Level 2	Level 3	Level 4	Total
2002-2003	61.5%	33.3%	5.1%	0.0%	39
2003-2004	61.8%	32.7%	3.6%	1.8%	55
2004-2005	33.3%	49.0%	13.7%	3.9%	51
2006-2007	38.1%	42.9%	14.3%	4.8%	21
2007-2008	47.6%	38.1%	9.5%	4.8%	21
2008-2009	37.5%	37.5%	20.8%	4.2%	24

The percent of proficient female biology students for year 3 of resource was 17.6% and for year 3 of inclusion it was 25.0%. The 25.0% proficiency was higher than any year of resource teaching methodology. Female proficiency increased by 7.4% points (25.0% minus 17.6%) after 3 years of inclusion. There was a decline in proficiency (19.1% minus14.3%) for the second year of inclusion and resource produced a slight increase (5.1% to 5.4%) for the second year. However, the number of student participants for inclusion years was about half of the number of participants for the resource years.

Table 17 indicates the percent proficient of different ethnic groups for both resource and inclusion school years. These high school special education students were examined for biology.

Table 17

Biology Percent Proficient by Level by Ethnicity for All Schools

	Level 1	Level 2	Level 3	Level 4	Total
Black					
2002-2003	69.8%	26.7%	3.5%	0.0%	86
2003-2004	73.5%	22.4%	4.1%	0.0%	98
2004-2005	48.8%	43.0%	7.0%	1.2%	86
2006-2007	36.6%	48.8%	12.2%	2.4%	41
2007-2008	38.3%	34.0%	23.4%	4.3%	47
2008-2009	36.4%	29.1%	30.9%	3.6%	55
White					
2002-2003	21.2%	30.3%	45.5%	3.0%	33
2003-2004	34.0%	32.1%	28.3%	5.7%	53
2004-2005	11.5%	38.5%	36.5%	13.5%	52
2006-2007	0.0%	62.5%	31.3%	6.3%	16
2007-2008	6.7%	26.7%	66.7%	0.0%	15
2008-2009	0.0%	11.1%	77.8%	11.1%	9
Other					
2002-2003	33.3%	66.7%	0.0%	0.0%	3
2003-2004	40.0%	40.0%	20.0%	0.0%	10
2004-2005	30.0%	60.0%	0.0%	10.0%	10
2006-2007	0.0%	83.3%	16.7%	0.0%	6
2007-2008	80.0%	20.0%	0.0%	0.0%	5
2008-2009	14.3%	42.9%	28.6%	14.3%	7

The third year of resource produced a proficiency of 8.2% and the third year of inclusion produced 34.5% proficiency on the part of Black biology students. Black biology student proficiency increased by 26.3% points after 3 years of inclusion. Their

proficiency at 34.5% was higher than any year of resource. The level 3 proficiency of Black students who took biology increased by 8.7% points (3.5% to 12.2%), 19.3% points (4.1% to 23.4%), and 23.9% points (7.0% to 30.9%) for inclusion years, respectively. Their level 4 proficiency also increased by 2.4% points (0.0% to 2.4%), 4.3% points (0.0% to 4.3%), and 2.4% points (1.2% to 3.6%), respectively, for the three years of inclusion. There were positively gaps favoring inclusion for level 3 and level 4 proficiencies for all 3 comparison years of this study. Yet, there was a trend of increases in the percent proficient for successive years of both resource and inclusion. However, the number of participants for inclusion years was about half the number of participants for resource years.

For White biology students, the percent proficient was 50.0% for year 3 of resource and 88.9% for year 3 of inclusion. The increase in biology proficiency was 38.9% points. The 66.7% proficiency for the second year of inclusion and 88.9% proficiency for the third year of inclusion were both higher than any year of resource. White students at level 3 dropped 14.2% points (45.5% to 31.3%) for inclusion during the first year. For the second and third years of inclusion, their level 3 proficiency increased by 38.4% points (28.3% to 66.7%) and 41.3% points (36.5% to 77.8%), respectively. White students at level 4 only produced a positive gap of 3.3% points (3.0% to 6.3%) for inclusion during the first year and produced negative gaps of 5.7% points (5.7% to 0.0%) and 2.4% points (13.5% to 11.1%) for the second and third years of inclusion, respectively. Their level 3 performance favored inclusion for 2 of the 3 years. There was a trend of increases in proficiency for each successive year of inclusion and there was a decline in proficiency for the second year and an increase for the third year of resource. The number of White student participants in biology for inclusion years was noticeably

less than participants for resource years.

"Other" in table 17 represents minorities such as Hispanic, Asian, Multi-racial, and Native American biology students combined. Their individual number of participants was too low for the researcher to have any confidence in the results. Yet, their collective proficiency increased after year 3 of inclusion by 32.9% points (10.0% to 42.9%).

Algebra 1

Table 18 shows the mean EOC scale scores for algebra 1 for all schools during particular school years. Beginning at 2006-2007 for all schools, the mean scale scores changed to three digit numbers due to the re-norming of the EOC tests. This fact dampened the ability of the researcher to do a single group t-test of significance by using the average mean scale scores for each school during both resource and inclusion years.

Table 18

Algebra 1 Scale Score by School by Year

School	School Year	Mean	N	Std. Deviation
East	2002-2003	47.82	50	6.375
	2003-2004	51.19	42	7.158
	2004-2005	47.49	39	5.803
	2006-2007	148.20	15	6.494
	2007-2008	144.13	23	9.206
	2008-2009	145.43	35	8.685
North	2002-2003	50.15	40	7.077
	2003-2004	51.89	46	8.925
	2004-2005	52.56	54	7.811
	2006-2007	146.43	30	7.569
	2007-2008	141.85	27	8.066
	2008-2009	142.19	36	6.705
West	2002-2003	48.68	80	5.616
	2003-2004	48.31	35	6.314
	2004-2005	49.52	56	5.939
	2006-2007	140.38	29	7.409
	2007-2008	142.97	31	7.688
	2008-2009	145.58	31	7.513

Table 19 shows algebra 1 proficiency levels by schools and by school years. There was a noticeable pattern of decreased percentages of students at level 2 during

inclusion years (2006-2009) compared to the resource years (2002-2005). On the other hand, the percentages of students at level 3 increased for the most part during the inclusion years.

Table 19

Algebra 1 Proficiency by School by Year

	Proficiency Levels								
	1		2		3		4		Total
	N	%	N	%	N	%	N	%	N
2002-2003 East	16	32.0	28	56.0	5	10.0	1	2.0	50
North	10	25.0	21	52.5	7	17.5	2	5.0	40
West	21	26.3	47	58.8	12	15.0	0	.0	80
2003-2004 East	4	9.5	26	61.9	10	23.8	2	4.8	42
North	10	21.7	23	50.0	10	21.7	3	6.5	46
West	9	25.7	20	57.1	6	17.1	0	.0	35
2004-2005 East	15	38.5	19	48.7	5	12.8	0	.0	39
North	9	16.7	26	48.1	15	27.8	4	7.4	54
West	9	16.1	41	73.2	4	7.1	2	3.6	56
2006-2007 East	1	6.7	7	46.7	6	40.0	1	6.7	15
North	5	16.7	13	43.3	9	30.0	3	10.0	30
West	17	58.6	5	17.2	7	24.1	0	.0	29
2007-2008 East	9	39.1	5	21.7	8	34.8	1	4.3	23
North	11	40.7	7	25.9	8	29.6	1	3.7	27
West	9	29.0	14	45.2	6	19.4	2	6.5	31
2008-2009 East	8	22.9	13	37.1	12	34.3	2	5.7	35
North	11	30.6	22	61.1	2	5.6	1	2.8	36
West	6	19.4	12	38.7	12	38.7	1	3.2	31

Table 20 shows algebra 1 proficiency levels for all schools during specific school

years. For the most part, the percentages of students at level 1 increased during the inclusion years (2006-2009) for all schools. The percentages of students at level 2 decreased during the inclusion years. At level 3, the percentages of students increased during the inclusion years. For level 4, there was a small increase in the percentages of students during the inclusion years.

Table 20

Algebra 1 Proficiency Levels By School Year

	1		2		3		4		Total
	N	%	N	%	N	%	N	%	N
2002-2003	47	27.6	96	56.5	24	14.1	3	1.8	170
2003-2004	23	18.7	69	56.1	26	21.1	5	4.1	123
2004-2005	33	22.1	86	57.7	24	16.1	6	4.0	149
2006-2007	23	31.1	25	33.8	22	29.7	4	5.4	74
2007-2008	29	35.8	26	32.1	22	27.2	4	4.9	81
2008-2009	25	24.5	47	46.1	26	25.5	4	3.9	102

Table 20 delineates positive level 3 gaps of 15.6% points, 6.1% points, and 9.4% points, respectively, favoring inclusion over resource for the 3 years of comparison. Inclusion also had positive gaps at level 4 of 3.6% points and 0.8% points, respectively, when compared with the first 2 years of resource. Yet, there was a declining gap at level 4 of 0.1% points for inclusion during the third year of comparison. The overall percentages of proficient students in algebra 1 for the resource years were 15.9%, 25.2%, and 20.1%, respectively. For the inclusion years, the overall proficient level percentages were 35.1%, 32.0%, and 29.4%, respectively. This means that 64.9% were not proficient

for the first year of inclusion, 68.0% were not proficient for the second year of inclusion, and 70.6% were not proficient for the third year of inclusion. From the standpoint of being proficient, the gaps were 19.2% points, 6.8% points, and 9.3% points, respectively, when 3 corresponding years of resource and inclusion were examined. The resource years produced a positive gap between year 1 (15.9%) and year 2 (25.2%) and a negative gap between year 2 (25.2%) and year 3 (20.1%). The inclusion years produced all negative gaps as the number of years in the program increased. However, the number of participants for resource years was noticeably more than the number of participants for inclusion years. The third year of inclusion produced 29.4% proficient algebra 1 students and the third year of resource produced 20.1% proficient students. This 29.4% proficiency was higher than any year of resource percentage proficient.

With the effect of longevity in the inclusion program in mind, there was a negative proficiency gap of 3.0% points between year 1 (35.1%) and year 2 (32.1%) and there was also a negative gap of 2.7% points between year 2 (32.1%) and year 3 (29.4%) of inclusion. On the other hand, resource years produced a positive proficiency gap of 9.3% points between year 1 (15.9%) and year 2 (25.2%) and a negative gap of 5.1% points between year 2 (25.2%) and year 3 (20.1%).

Table 21 delineates algebra 1 proficiency for all schools during resource years (2002-2005). By a noticeable difference, the highest percentage (56.8%) of students was at level 2. Students at level 1 claimed the second place percentage at 23.3%. The overall percentage of algebra 1 proficient students for resource years was 19.9%.

Table 21

Algebra 1 Proficiency Levels For Resource Years

	1		2		3		4		Total
	N	%	N	%	N	%	N	%	N
Algebra 1	103	23.3	251	56.8	74	16.7	14	3.2	442

Table 22 displays the algebra 1 proficiency levels for all schools during the inclusion years (2006-2009). Students' proficiency at level 2 was the highest percentage at 38.1%. The percentage of students at level 1 was 30.0% and 27.2% at level 3. Level 3 percentages increased from 16.7% for resource years to 27.2% for inclusion years. The overall percentage of proficient students in algebra 1 for inclusion years was 31.9%. This represented a 12% point gap greater than the proficiency during the resource years for all schools.

Table 22

Algebra 1 Proficiency Levels For Inclusion Years

	1		2		3		4		Total
	N	%	N	%	N	%	N	%	N
Algebra 1	77	30.0	98	38.1	70	27.2	12	4.7	257

Table 23 shows the analysis of variance (ANOVA) to indicate differences by school, if any, for algebra 1. The table supported the idea that there was a significant difference between schools for algebra 1. As a result, the null hypothesis was rejected because the significance was less than the predetermined alpha level of 0.05.

Table 23

Analysis of Variance for Resource Years (Algebra 1 Mean Scale Score)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	753.387	2	376.693	8.083	.000
Within Groups	20459.111	439	46.604		
Total	21212.498	441			

Table 24

Algebra 1 Scale Score Confidence Intervals (Resource Years)

Scheffe

(I) School ID	(J) School ID	Mean Difference (I-J)	Std. Error	Sig.	95% Conf. Interval	
					Lower Bd.	Upper Bd.
East	North	-2.85*	.804	.002	-4.82	-.87
	West	-.08	.768	.995	-1.96	1.81
North	East	2.85*	.804	.002	.87	4.82
	West	2.77*	.754	.001	.92	4.62
West	East	.08	.768	.995	-1.81	1.96
	North	-2.77*	.754	.001	-4.62	-.92

*The mean difference is significant at the 0.05 level.

Table 25

Algebra 1 Scale Score Homogeneous Subsets (Resource Years)

Scheffe

School ID	N	Subset for alpha = 0.05	
		1	2
East	131	48.80	
West	171	48.88	
North	140		51.65
Sig.		.995	1.000

In Table 25 the means for groups in homogeneous subsets are displayed. The harmonic mean sample size was 145.459. The harmonic mean of the group sizes was used because the group sizes were unequal. Type 1 error levels were not guaranteed.

Table 26 depicts the ANOVA to indicate the difference between schools, if any, for algebra 1 for inclusion years. The table indicates that the difference in mean scores between schools is not significant because the significance level of .097 is more than the predetermined alpha level of 0.05.

Table 26

Analysis of Variance for Inclusion Years (Algebra 1 Mean Scale Score)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	294.426	2	147.213	2.352	.097
Within Groups	15899.691	254	62.597		
Total	16194.117	256			

Table 27

Algebra 1 Scale Score Confidence Intervals (Inclusion Years)

Scheffe

(I) School ID	(J) School ID	Mean Difference (I-J)	Std. Error	Sig.	95% Conf. Interval	
					Lower Bd.	Upper Bd.
East	North	2.13	1.190	.204	-.80	5.06
	West	2.56	1.195	.104	-.39	5.50
North	East	-2.13	1.190	.204	-5.06	.80
	West	.43	1.122	.929	-2.33	3.19
West	East	-2.56	1.195	.104	-5.50	.39
	North	-.43	1.122	.929	-3.19	2.33

Table 28

Algebra 1 Scale Score Homogeneous Subsets (Inclusion Years)

Scheffe

School ID	N	Subset for alpha = 0.05
		1
West	91	143.03
North	93	143.46
East	73	145.59
Sig.		.094

Table 28 displays the means for groups in homogeneous subsets. The harmonic

mean sample size was 84.649. In that the group sizes were unequal, the harmonic mean of the group sizes was used. Type 1 error levels were not guaranteed.

Tables 29 and 30 indicate the male and female gender proficiencies for algebra 1. This data accounted for all schools in the study and both resource and inclusion school years. The focus was high school special education students.

Table 29

Male Percent Proficient in Algebra 1 for All Schools

School Year	Level 1	Level 2	Level 3	Level 4	Total
2002-2003	29.7%	55.9%	11.7%	2.7%	111
2003-2004	11.1%	59.3%	24.7%	4.9%	81
2004-2005	24.5%	58.5%	11.7%	5.3%	94
2006-2007	32.1%	30.2%	32.1%	5.7%	53
2007-2008	32.1%	37.5%	23.2%	7.1%	56
2008-2009	26.8%	43.7%	25.4%	4.2%	71

The percent of proficient male algebra 1 students was 17.0% for year 3 of resource and 29.6% for year 3 of inclusion. Male algebra 1 students' proficiency increased by 12.6% points (17.0% to 29.6%) after the third year of inclusion. The second year of resource and the third year of inclusion had the same percent proficient at 29.6%. Inclusion produced declines in proficiency of 7.5% (37.8% to 30.3%) for the second year and 0.7% (30.3% to 29.6%) for the third year. On the other hand, resource methodology produced an increase in proficiency only for the second year of 15.2% (14.4% to 29.6%). However, the number of participants for the resource years was somewhat greater than the number of participants for inclusion years.

Table 30

Female Percent Proficient in Algebra 1 for All Schools

School Year	Level 1	Level 2	Level 3	Level 4	Total
2002-2003	23.7%	57.6%	18.6%	0.0%	59
2003-2004	33.3%	50.0%	14.3%	2.4%	42
2004-2005	18.2%	56.4%	23.6%	1.8%	55
2006-2007	28.6%	42.9%	23.8%	4.8%	21
2007-2008	44.0%	20.0%	36.0%	0.0%	25
2008-2009	19.4%	51.6%	25.8%	3.2%	31

Table 30 shows female percent proficient was 25.4% in algebra 1 for year 3 of resource and 29.0% for year 3 of inclusion. The increase was only 3.6% points (25.4% to 29.0%). The 29.0% proficiency was higher than any year of resource. There were declines in percent proficient for the second year (16.7%) of resource and the third year (29.0%) of inclusion. The number of participants for inclusion years was about half the number of resource participants. During resource years, there was a trend of slight increases and inclusion years also produced a trend of slight increases in the percent of proficient female algebra 1 students.

Table 31 indicates the proficiency of different ethnic groups for both resource and inclusion school years. These high school special education students were examined for algebra 1.

Table 31

Algebra 1 Percent Proficient by Level by Ethnicity for All Schools

	Level 1	Level 2	Level 3	Level 4	Total
Black					
2002-2003	31.0%	57.9%	11.1%	0.0%	126
2003-2004	22.5%	59.2%	18.3%	0.0%	71
2004-2005	26.0%	63.5%	8.3%	2.1%	96
2006-2007	37.0%	39.1%	21.7%	2.2%	46
2007-2008	41.5%	35.8%	18.9%	3.8%	53
2008-2009	28.4%	46.3%	23.9%	1.5%	67
White					
2002-2003	18.4%	47.4%	26.3%	7.9%	38
2003-2004	13.6%	50.0%	25.0%	11.4%	44
2004-2005	13.3%	42.2%	35.6%	8.9%	45
2006-2007	11.1%	22.2%	61.1%	5.6%	18
2007-2008	11.8%	41.2%	41.2%	5.9%	17
2008-2009	13.0%	52.2%	26.1%	8.7%	23
Other					
2002-2003	16.7%	83.3%	0.0%	0.0%	6
2003-2004	12.5%	62.5%	25.0%	0.0%	8
2004-2005	25.0%	75.0%	0.0%	0.0%	8
2006-2007	40.0%	30.0%	10.0%	20.0%	10
2007-2008	45.5%	0.0%	45.5%	9.1%	11
2008-2009	25.0%	33.3%	33.3%	8.3%	12

For Black algebra 1 students, the third year of resource produced 10.4% proficient and the third year of inclusion produced 25.4% proficient. Their proficiency increased by 15.0% points after 3 years of inclusion. The 25.4% proficiency was higher than any year

of resource. At level 3, Black algebra 1 students' performance increased by 10.6% points (11.1% to 21.7%), 0.6% points (18.3% to 18.9%), and 15.6% points (8.3% to 23.9%) for inclusion years, respectively. At level 4, the positive gaps of 2.2% points 90.0% to 2.2%) and 3.8% points (0.0% to 3.8%) existed for the first 2 years of inclusion, respectively. The third year of inclusion produced a decline of 0.6% points (2.1% to 1.5%). At level 3, Black student proficiency increased all 3 years of inclusion. Black students at level 4 increased 2 of the 3 years of inclusion. When proficient Black algebra 1 students were examined, the trend showed slight increases for both resource and inclusion years. The number of participants for inclusion years was less than the participants for resource years.

For White algebra 1 students, the percent proficient was 44.5% for year 3 of resource and 34.8% for year 3 of inclusion. Their proficiency dropped by 9.7% points after 3 years of inclusion. At level 3, White students' proficiency improved by 34.8% points (26.3% to 61.1%) and 16.2% points (25.0% to 41.2%) for the first 2 years of inclusion, respectively. On the other hand, their level 3 proficiency declined by 9.5% points (35.6% to 26.1%) for the third year of inclusion. White students at level 4 declined slightly all 3 years of inclusion. There was a steady increase in proficiency for successive years of resource and a steady decrease in proficiency for successive years of inclusion. The inclusion participants were about half of those for each year of resource.

Other in table 31 represented minorities such as Hispanic, Asian, Multi-racial, and Native American algebra 1 students combined due to the low number of individual group participants and lack of sufficient data. However, their combined proficiency increased by 41.6% points (0.0% to 41.6%) after year 3 of inclusion.

English 1

Table 32 shows English 1 EOC test mean scale scores by schools and by school years. For all schools, the mean scale scores changed beginning in the 2006-2007 school year due to re-norming of the EOC tests. As a result, comparing average mean scale scores for schools between resource and inclusion years was negatively impacted. The single group t-test of significance was also elusive.

Table 32

English 1 Scale Score

School	School Year	Mean	N	Std. Deviation
East	2002-2003	48.83	54	7.583
	2003-2004	49.80	59	8.957
	2004-2005	50.86	37	7.871
	2006-2007	141.06	51	7.654
	2007-2008	140.67	49	7.880
	2008-2009	142.96	45	7.267
North	2002-2003	47.73	49	8.319
	2003-2004	51.11	54	8.542
	2004-2005	51.34	62	8.029
	2006-2007	142.54	52	9.037
	2007-2008	142.53	30	9.899
	2008-2009	143.57	30	7.740
West	2002-2003	45.17	54	5.719
	2003-2004	44.91	45	6.578
	2004-2005	48.31	55	5.993
	2006-2007	138.15	65	4.819
	2007-2008	141.38	37	5.790
	2008-2009	140.46	52	6.864

Table 33 depicts English 1 proficiency levels for schools during specific school

years. The existence of a particular trend in proficiency from resource to inclusion years was elusive to the researcher.

Table 33

English 1 Proficiency by School by Year

	Proficiency Levels								
	1		2		3		4		Total
	N	%	N	%	N	%	N	%	N
2002-2003 East	12	22.2	26	48.1	12	22.2	4	7.4	54
North	15	30.6	18	36.7	13	26.5	3	6.1	49
West	17	31.5	29	53.7	8	14.8	0	.0	54
2003-2004 East	11	18.6	23	39.0	14	23.7	11	18.6	59
North	9	16.7	19	35.2	18	33.3	8	14.8	54
West	14	31.1	23	51.1	8	17.8	0	.0	45
2004-2005 East	6	16.2	12	32.4	15	40.5	4	10.8	37
North	10	16.1	21	33.9	25	40.3	6	9.7	62
West	8	14.5	29	52.7	17	30.9	1	1.8	55
2006-2007 East	18	35.3	20	39.2	12	23.5	1	2.0	51
North	17	32.7	17	32.7	14	26.9	4	7.7	52
West	29	44.6	29	44.6	7	10.8	0	.0	65
2007-2008 East	19	38.8	15	30.6	13	26.5	2	4.1	49
North	12	40.0	8	26.7	7	23.3	3	10.0	30
West	11	29.7	14	37.8	12	32.4	0	.0	37
2008-2009 East	10	22.2	19	42.2	14	31.1	2	4.4	45
North	4	13.3	17	56.7	6	20.0	3	10.0	30
West	19	36.5	20	38.5	12	23.1	1	1.9	52

Table 34 shows English 1 proficiency levels for all schools during specific school

years. There was a pattern of increased percentages of students at level 1 during inclusion years, but any other patterns of increases or decreases were not very conspicuous to the researcher.

Table 34

English 1 Proficiency Levels by School Year

	Proficiency Levels								
	1		2		3		4		Total
	N	%	N	%	N	%	N	%	N
2002-2003	44	28.0	73	46.5	33	21.0	7	4.5	157
2003-2004	34	21.5	65	41.1	40	25.3	19	12.0	158
2004-2005	24	15.6	62	40.3	57	37.0	11	7.1	154
2006-2007	64	38.1	66	39.3	33	19.6	5	3.0	168
2007-2008	42	36.2	37	31.9	32	27.6	5	4.3	116
2008-2009	33	26.0	56	44.1	32	25.2	6	4.7	127

When 3 corresponding years of English 1 resource and inclusion teaching methodologies were examined (Table 34), inclusion at level 3 produced a negative gap of 1.4% points, a positive gap of 2.3 % points, and a negative gap of 11.8% points, respectively. At level 4, inclusion caused negative gaps of 1.5% points, 7.7% points, and 2.4% points, respectively. The percentages of proficient students (levels 3 and 4) for resource years were 25.5%, 37.3%, and 44.2%, respectively, for 3 years. The percentages of proficient students for inclusion years were 22.6%, 31.9%, and 29.9%, respectively, for 3 years. This means that 77.4%, 68.1%, and 70.1% of the students, respectively, were not proficient for the 3 years of inclusion. The gaps for proficient

students were all negative at 2.9% points, 5.4% points, and 14.3% points, respectively, favoring resource years when examined along with 3 corresponding years of inclusion. However, the number of participants for the last 2 years of inclusion was somewhat less than the last 2 years of resource. The third year of resource produced 44.1% proficient English 1 students and the third year of inclusion produced 29.9% proficient students. This 44.1% proficiency was higher than any given year of inclusion.

When the effect of longevity in the inclusion program was examined, a positive gap of students at grade level of 9.3% points existed between year 1 (22.6%) and year 2 (31.9%) and a negative gap of 2.0% points occurred between year 2 (31.9%) and year 3 (29.9%) of inclusion. For resource years, there were positive gaps of 11.8% points and 6.9% points for the same time intervals. Inclusion produced mixed results with 1 year of increase in percentage of proficient students and 1 year of a decrease in percentage of proficient students. Resource teaching produced increases in percentage of proficient students for the subsequent 2 years.

Table 35 displays English 1 proficiency levels for all schools during resource years. The percentage of students at level 2 was the highest at 42.6%. The percentage of students at level 3 was 27.7% and the percentage of students at level 4 was 7.9%. Nevertheless, the total percentage of students at grade level was 35.6%.

Table 35

English 1 Proficiency Levels For Resource Years

	1		2		3		4		Total
	N	%	N	%	N	%	N	%	N
Proficiency Level	102	21.7	200	42.6	130	27.7	37	7.9	469

Table 36 portrays English 1 proficiency levels for all schools during inclusion years. The percentage of students at level 2 was the highest at 38.7% and the percentage of students at level 1 followed at 33.8%. The percentage of students at level 2 decreased slightly from 42.6% for resource years to 38.7% for inclusion years. Level 3 students also decreased slightly from 27.7% for resource years to 23.6% for inclusion years. Students at level 4 decreased from 7.9% for resource years to 3.9% for inclusion years. Yet, the total percentage of students who were proficient (at grade level) was 27.5%. When the resource years were compared with the inclusion years for all schools, the percentage of students at grade level decreased from 35.6% for resource years to 27.5% for inclusion years. This decrease was by 8.1% points when inclusion teaching methodology was used.

Table 36

English 1 Proficiency Levels For Inclusion Years

	1		2		3		4		Total
	N	%	N	%	N	%	N	%	N
Proficiency Level	139	33.8	159	38.7	97	23.6	16	3.9	411

Table 37 shows the analysis of variance (ANOVA) to indicate differences by

school, if any, for English 1. The table supports the idea that there was a significant difference between schools for English 1. As a result, the null hypothesis was rejected because the significance is less than the predetermined alpha level of 0.05.

Table 37

Analysis of Variance for Resource Years (English 1 Mean Scale Score)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1473.289	2	736.644	12.474	.000
Within Groups	27520.396	466	59.057		
Total	28993.685	468			

Table 38

English 1 Scale Score Confidence Intervals (Resource Years)

Scheffe

(I) schnum	(J) schnum	Mean Difference (I-J)	Std. Error	Sig.	95% Conf. Interval	
					Lower Bd.	Upper Bd.
North	West	3.980*	.861	.000	1.87	6.09
	East	.481	.867	.858	-1.65	2.61
West	North	-3.980*	.861	.000	-6.09	-1.87
	East	-3.499*	.882	.000	-5.66	-1.33
East	North	-.481	.867	.858	-2.61	1.65
	West	3.499*	.882	.000	1.33	5.66

*The mean difference is significant at the 0.05 level.

Table 39

English 1 Scale Score Homogeneous Subsets (Resource Years)

Scheffe

Schnum	N	Subset for alpha = 0.05	
		1	2
West	154	46.21	
East	150		49.71
North	165		50.19
Sig.		1.000	.859

Table 39 displays the means for groups in homogeneous subsets. The harmonic mean sample size was 156.081. In that the group sizes were unequal, the harmonic mean of the group sizes was used. Type 1 error levels were not guaranteed.

Table 40 shows the ANOVA to indicate the difference between schools, if any, for English 1 during inclusion years. The table supports a significant difference between schools because the significance level of .003 is less than the predetermined alpha level of 0.05.

Table 40

Analysis of Variance for Inclusion Years (English 1 Mean Scale Score)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	648.695	2	324.348	5.875	.003
Within Groups	22525.120	408	55.209		
Total	23173.815	410			

Table 41

English 1 Scale Score Confidence Intervals (Inclusion Years)

Scheffe

(I) schnum	(J) schnum	Mean Difference (I-J)	Std. Error	Sig.	95% Conf. Interval	
					Lower Bd.	Upper Bd.
North	West	3.105*	.923	.004	.84	5.37
	East	1.295	.935	.384	-1.00	3.59
West	North	-3.105*	.923	.004	-5.37	-.84
	East	-1.809	.860	.111	-3.92	.30
East	North	-1.295	.935	.384	-3.59	1.00
	West	1.809	.860	.111	-.30	3.92

*The mean difference is significant at the 0.05 level.

Table 42

English 1 Scale Score Homogeneous Subsets (Inclusion Years)

Scheffe

Schnum	N	Subset for alpha = 0.05	
		1	2
West	154	139.71	
East	145	141.52	141.52
North	112		142.81
Sig.		.138	.361

In Table 42 the means for groups in homogeneous subsets were displayed. The

harmonic mean sample size was 134.417. The harmonic mean of the group sizes was used because the group sizes were unequal. Type 1 error levels were not guaranteed.

Tables 43 and 44 depict the English 1 male and female gender proficiencies for all schools that were involved in the study. The resource-only school years (2002-2005) and the inclusion school years (2006-2009) were included.

Table 43

Male Percent Proficient in English 1 for All Schools

School Year	Level 1	Level 2	Level 3	Level 4	Total
2002-2003	33.7%	44.2%	16.3%	5.8%	104
2003-2004	21.1%	44.0%	22.0%	12.8%	109
2004-2005	17.7%	44.8%	30.2%	7.3%	96
2006-2007	39.7%	38.0%	19.8%	2.5%	121
2007-2008	41.2%	28.2%	27.1%	3.5%	85
2008-2009	29.2%	39.3%	25.8%	5.6%	89

Male students' percent proficient in English 1 for year 3 of resource was 37.5% and this was higher than any year of inclusion. Inclusion produced 22.3%, 30.6%, and 31.4% proficient for years 1, 2, and 3, respectively. Male student proficiency was 6.1% points (37.5% minus 31.4%) lower after the third year of inclusion when the third year of resource was examined. However, the percent proficient for male English 1 students increased for each successive year of both resource and inclusion.

Table 44

Female Percent Proficient in English 1 for All Schools

School Year	Level 1	Level 2	Level 3	Level 4	Total
2002-2003	17.0%	50.9%	30.2%	1.9%	53
2003-2004	22.4%	34.7%	32.7%	10.2%	49
2004-2005	12.1%	32.8%	48.3%	6.9%	58
2006-2007	34.0%	42.6%	19.1%	4.3%	47
2007-2008	22.6%	41.9%	29.0%	6.5%	31
2008-2009	18.4%	55.3%	23.7%	2.6%	38

For female students, the English 1 proficiency percentage was 55.2% for year 3 of resource methodology and this was higher than any year of inclusion. Inclusion produced 23.4%, 35.5%, and 26.3% proficiencies for years 1, 2, and 3, respectively. The percent proficiency for female English 1 students actually decreased by 28.9% points (55.2% minus 26.3%) when the third years of both resource and inclusion were examined. There was an increase in percent proficient for each successive year of resource, but only the second year of inclusion produced an increase in the percent proficient.

Table 45 indicates the proficiency of different ethnic groups for both resource and inclusion school years. These high school special education students were examined for English 1.

Table 45

English 1 Percent Proficient by Level by Ethnicity for All Schools

	Level 1	Level 2	Level 3	Level 4	Total
Black					
2002-2003	31.5%	54.6%	13.0%	0.9%	108
2003-2004	28.3%	51.1%	18.5%	2.2%	92
2004-2005	18.4%	48.3%	32.2%	1.1%	87
2006-2007	45.0%	45.0%	10.1%	0.0%	109
2007-2008	39.7%	35.9%	23.1%	1.3%	78
2008-2009	30.6%	44.9%	22.4%	2.0%	98
White					
2002-2003	18.2%	29.5%	38.6%	13.6%	44
2003-2004	7.4%	24.1%	38.9%	29.6%	54
2004-2005	10.7%	26.8%	44.6%	17.9%	56
2006-2007	16.2%	32.4%	40.5%	10.8%	37
2007-2008	26.1%	17.4%	43.5%	13.0%	23
2008-2009	10.5%	42.1%	31.6%	15.8%	19
Other					
2002-2003	40.0%	20.0%	40.0%	0.0%	5
2003-2004	33.3%	41.7%	16.7%	8.3%	12
2004-2005	18.2%	45.5%	36.4%	0.0%	11
2006-2007	40.9%	22.7%	31.8%	4.5%	22
2007-2008	33.3%	33.3%	26.7%	6.7%	15
2008-2009	10.0%	40.0%	40.0%	10.0%	10

For Black English 1 students, a gap of 2.9% points (13.0% to 10.1%) represented a decline during the first year of inclusion at level 3. A gap that represented a 4.6% point (18.5% to 23.1%) increase existed for the second year of inclusion at level 3. Students

who participated in inclusion experienced a 9.8% point (32.2% to 22.4%) decline for level 3 during the third year of inclusion. At level 4 proficiency, Black students experienced decreasing gaps of 0.9% points (0.9% to 0.0%) and (2.2% to 1.3%) for the first 2 years of inclusion and also an increase of 0.9% points (1.1% to 2.0%) favoring inclusion for the third year. When Black students at grade level were examined, there was a trend of increases for both resource and inclusion years. The percent proficient for Black students for year 3 of resource was 33.3% and for year 3 of inclusion was 24.4%. This represented a decline of 8.9% points after 3 years of inclusion. However, the number of participants was comparable for resource and inclusion years.

White students experienced increases at level 3 of 1.9% points (38.6% to 40.5%) and 4.6% points (38.9% to 43.5%) for the first 2 years of inclusion, respectively. On the other hand, they faced a decrease at level 3 of 13.0% points (44.6% to 31.6%) for the third year of inclusion. The level 4 proficiency of White students decreased by 2.8% points (13.6% to 10.8%), 16.6% points (29.6% to 13.0%), and 2.1% points (17.9% to 15.8%) for all 3 years of inclusion, respectively. A trend of slight increases existed during both resource and inclusion years for White students at grade level. The percent proficient for year 3 of resource was 62.5% and for year 3 of inclusion it was 47.4%. This represented a decline of 15.1% points after 3 years of inclusion. During the inclusion years, the number of participants was noticeably less than those in resource years.

“Other” in table 45 represented minorities such as Hispanic, Asian, Multi-racial, and Native American English 1 students combined. The number of participants for the individual groups was too low for the researcher to have confidence in the results. However, their collective proficiency increased by 13.6% points (36.4% to 50.0%) after

year 3 of inclusion.

High school biology special education students experienced increases in level 3 and level 4 proficiencies as a result of inclusion teaching methodology. The percent proficient for the third year of inclusion was almost twice the percent proficient for year three of resource. Successive years of inclusion produced positive gaps in proficiency. Both male and female biology students were positively impacted when inclusion methodology was used. Black and White biology students experienced gains in academic proficiency when inclusion was used. The years in the inclusion program resulted in all positive gaps in percent proficient and the years in resource resulted in mixed outcomes.

Algebra 1 high school special education students' academic proficiencies were positively impacted by the use of inclusion teaching methodology. The percent proficient at the end of year 3 of inclusion was higher than any year of resource. For the most part, both male and female algebra 1 students benefited from inclusion. Year 3 of inclusion for both males and females was higher in the percent proficient than year 3 of resource. Black algebra 1 students experienced a pattern of increased percent proficient as a result of inclusion methodology. On the other hand, White students were not positively impacted by inclusive practices in algebra 1. Hispanic students showed academic gains in percent proficient for inclusion years. The years in the algebra 1 inclusion program were responsible for all negative proficiency gaps, but the results for the resource program were not definitive although there was one positive proficiency gap.

English 1 high school special education students did not seem to be positively impacted by participation in inclusion. The percent proficient after year 3 of resource was noticeably higher than that of year 3 of inclusion. Male English 1 students experienced positive gaps for inclusion years and resource years. Yet, the percent

proficient for year 3 of resource was noticeably higher than that of year 3 of inclusion. Female students experienced positive proficiency gaps for resource years and the third year of resource was more than double the percent proficient for the third year of inclusion. For both Black and White students, the percent proficient after year 3 of resource was noticeably higher than the percent proficient after year 3 of inclusion. Hispanic students experienced steady increases in percent proficient for inclusion years and year 3 of inclusion was slightly higher in percent proficient than year 3 of resource. The years in English 1 inclusion showed no distinguishable outcomes to report, but resource years produced all positive gaps.

The use of analysis of variance between schools and 95% confidence intervals helped to reject the null hypothesis and to make generalizations about the use of inclusive practices in the urban North Carolina school district. As a result, the researcher also made inferences about the population parameter based on sample statistics. The population included all special education students who attended traditional high schools and took EOC tests within an urban North Carolina school district.

Summary

Chapter 4 has presented the results of the study. A description of the study sample was provided. An analysis of the data with regard to each research question was given and comments on the results were provided.

The results of the study indicated that the use of inclusion teaching methodology in biology and algebra 1 impacted academic achievement more favorably than in English 1. Both male and female students benefited from inclusion in all subjects except English 1. Black students were positively impacted by inclusion in biology and algebra 1, but not in English 1. White students benefitted from inclusion in biology, but not in algebra 1

and English 1. Hispanic students appeared to benefit from inclusive practices in English 1, algebra 1, and biology. Asian, Multi-racial, and Native American student data were not very reliable due to the small number of participants and lack of sufficient data. The years in the inclusion program showed promising outcomes in biology, but the outcomes in English 1 and algebra I were not very encouraging. Statistical significance was established by the use of 95% confidence intervals and ANOVA.

Chapter 5: Summary and Conclusions

Introduction

Chapter 5 presents an overview of the study, conclusions and implications, and recommendations for further research. This study made use of English 1, biology, and algebra 1 scale scores from North Carolina end-of-course tests. The purpose was to determine the impact of inclusion on the academic achievement of high school special education students as function of gender, ethnicity, and years of inclusion. In addition, this study sought to determine generalizations with confidence that can be made about the use of inclusion teaching methodology in high schools within an urban North Carolina school district.

Overview of the Study

Due to increased pressure to raise high school proficiency in North Carolina, a key objective of this study was to examine whether inclusion teaching methodology caused positive, negative or no gaps in student academic achievement when resource teaching methodology was used as a baseline. The North Carolina end-of-course tests were used as instruments to measure student academic achievement. They were characterized by high reliability and validity.

The scale scores of North Carolina end-of-course tests were used to measure the academic achievement of high school special education students for 3 years of resource teaching methodology and 3 years of inclusion teaching methodology. The resource school years were 2002-2003, 2003-2004, and 2004-2005. Inclusive practices were examined for the 2006-2007, 2007-2008, and 2008-2009 school years. Three traditional high schools within an urban North Carolina school district were randomly selected to create a cluster sample for the purposes of this study. The district Instructional

Accountability Research Department compiled the data for this study. Due to the re-norming of the end-of-course tests, a single group t-test could not be used to measure the significance of any difference in mean scale scores.

Summary of Results

After statistical analysis of the data, the two research questions were answered as follows:

Research Question 1

English I special education students at proficiency level 3 showed declining gaps for 2 of the 3 years of inclusion. At level 4, there were declining gaps for all 3 years of inclusion in English 1. When the grade level proficiency of English 1 students was examined, a trend of increases existed for both resource and inclusion years. Yet, resource years produced better results for English 1. In biology, students at level 3 showed positive gaps for all 3 years of inclusion and 2 of the 3 years produced positive gaps at level 4. Biology students at grade level proficiency showed a trend of increases for both resource and inclusion years. Algebra 1 students experienced positive gaps at level 3 for all 3 years of inclusion when resource years were used as a baseline and they had positive gaps at level 4 for 2 of the 3 years of inclusion methodology. The grade level proficiency of algebra 1 students produced a trend of higher percent proficient than during resource years although the proficiency decreased during inclusion years. Years in the inclusion program negatively impacted algebra 1 and English 1 students and yielded positive results for biology. Male students in English 1 experienced a trend of positive gaps at level 3 and female students showed declining gaps at level 3 favoring inclusion. At grade-level proficiency, both female and male English 1 students produced a trend of increases for both resource and inclusion years. However, they performed better during

the English resource years. Both male and female students in biology displayed a pattern of positive gaps when they experienced inclusion. Both male and female algebra 1 students showed trends of positive gaps at levels 3 and 4 favoring inclusion. At grade level proficiency, male algebra 1 students showed increases during resource years and decreases during inclusion years. However, the percent proficient male algebra 1 students were higher than most years of resource. On the other hand, female algebra 1 students displayed a trend of increases for both resource and inclusion years as it related to grade level proficiency. When they experienced inclusive practices in English 1, Black and White students did not show positive outcomes. Black and White biology students benefitted from inclusion teaching methodology. Black students benefitted more than White students in inclusive algebra 1 classrooms.

Research Question 2

What generalizations with confidence can be made about the use of inclusion methodology in high schools within an urban North Carolina school district as measured by end-of-course test scale scores?

The analysis of variance (ANOVA) results revealed that there was a statistical significant difference between the three schools for algebra 1, biology, and English 1 for the most part. During inclusion years, there was one exception to significant differences between schools for algebra 1. In addition, the null hypothesis was rejected because the significance was less than the predetermined alpha level of 0.05. The null hypothesis indicated that there will be no difference in academic achievement between high school special education students who experience inclusion and comparable students who experience resource methodology as measured by average mean scale scores on EOC tests. Afterwards, 95% confidence intervals were used to determine whether a range of

sample mean EOC scale scores likely contained the population means. There was only a 5% probability that the sample confidence limits did not contain the population mean. The researcher inferred that there was a strong likelihood that the true population means lay between the reported sample confidence limits for biology, English 1, and algebra 1 as reported by the Scheffe tests.

Discussion of Conclusions

From the results of this study, it can be concluded that there was no distinguishable trend of inclusion teaching methodology causing gains in overall English 1 student proficiency. The number of years in the inclusion program did not positively impact student academic achievement. Male and female students were not positively impacted by their experiences in inclusive English 1 classrooms. Black and White students did not produce promising results in inclusive English 1 environments. Multi-racial and Native American students' data were elusive. Hispanic data were positive for inclusion, but due to the small number of Hispanic participants the researcher is skeptical of the results.

For biology, the percent proficient for each year of inclusion was positive when resource years were used as a baseline. The number of years in the inclusion program positively impacted students' performance. Both male and female students experienced higher academic achievement in inclusive biology classrooms. Black and White students appeared to be more positively impacted by inclusion teaching methodology as measured by the percentages of students who were proficient.

High school special education algebra 1 students experienced positive gains in proficiency for all 3 years of inclusion teaching methodology when resource teaching methodology results were used as a baseline. Algebra 1 student data showed higher

percentages of students proficient in the resource years than in the inclusion years of the study. Both male and female students benefitted from the inclusive algebra 1 environment. Percentagewise, more Black students were proficient in algebra 1 during inclusion years of the study than in resource years of the study. White students showed declines in proficiency during the inclusion years.

The results of this study supported the literature in which Smith (1997) reported that by adapting the curriculum, students with disabilities experienced positive academic achievement outcomes (Keefe & Moore, 2004). She also concluded that inclusion was complex and needs further study.

Implications of the Study

Past research on the impact of inclusion focused on the elementary and middle school levels. Inclusion research at the high school level was very scarce. This study was an attempt to highlight the effects of inclusion at the high school level, but the results can only be generalized for the local North Carolina urban school district that was the source of the cluster sample. In addition, many educators were aware that high school special education students generally do not perform as well as their general education peers on end-of-course tests that measure academic achievement. Inclusive practices were strategies that this local North Carolina school district embraced to address the aforementioned challenge. As a result, the overall proficiency of a high school can be increased and the pressures to improve local high schools can be alleviated.

Inclusive practices for English 1 did not show much promise for high school special education students overall and the number of years in the inclusion program did not appear to be a factor. Male and female students were not positively impacted by inclusion in this study. In addition, Black and White students did not appear to benefit

academically from inclusion.

High school special education students in biology benefitted overall from inclusive practices. Biology students were positively impacted by the number of years in the inclusion program. The proficiency of both male and female biology students increased because of inclusive practices. Black and White students benefitted most from inclusive practices in biology.

Algebra 1 special education students overall experienced gains due to inclusive practices. The number of years in the inclusion program did not show a positive correlation with student proficiency. Both male and female algebra 1 students showed increased proficiency when inclusive practices were used. Black students prospered academically when inclusion teaching methodology was used, but White students did not.

Recommendations for Further Research

One recommendation is for someone to replicate this study and make sure that inclusion is actually occurring at the participating schools. Another recommendation is for this study to expand to include the state of North Carolina. As a result, recommendations from the study could impact academic achievement for all traditional high schools in the state. For the purpose of this study, the results were generalized to apply to the population of a local North Carolina urban school district. As mentioned earlier, the knowledge base and repertoire of strategies for effective teaching of high school special education students should reach further than one local North Carolina school district.

Conclusions

This study examined the impact of inclusion on the academic achievement outcomes of high school special education students as measured by English 1, biology,

and algebra 1 as function of gender, ethnicity, and years of inclusion. The three randomly selected traditional high schools had to be in existence from 2002 to 2009. A cluster sample consisted of all special education students from the three high schools who took English 1, biology, and algebra 1 North Carolina end-of-course tests.

The study also sought generalizations with confidence that could be made about the use of inclusion teaching methodology in high schools within an urban North Carolina school district as measured by end-of-course test scale scores. An analysis of variance was conducted to research differences among the schools. The established confidence limits allowed the researcher to generalize sample statistics to population means.

English 1 special education students in general did not benefit from inclusion teaching methodology because the most productive year of resource was better than any year of inclusion. The years in the inclusion program produced no trend of increased student academic proficiency. For male and female students, the best 2 years of resource percent proficient were better than any year of inclusion. Black and White students produced higher percent proficient than any inclusion years after the third year of resource.

In general, biology students were positively impacted by inclusion teaching methodology because all the gaps were positive when corresponding resource years were examined. There was a pattern of positive gaps when the years in the inclusion program were examined. Both male and female biology special education students were more proficient academically during inclusion years. Black and White biology students performed at a higher percent proficient during inclusion years.

Algebra 1 special education students in general showed positive gaps in percent

proficient during inclusion years when examined with corresponding resource years. The years in the inclusion program produced all negative gaps in percent proficient during inclusion years for algebra 1 students. Both male and female algebra 1 students were more proficient for 2 of the 3 years of inclusion than any of the resource years. Black students produced a trend of positive gaps in academic proficiency when they participated in inclusive practices, but White students produced negative gaps. For Black students, year 3 of inclusion produced a higher percent proficient than any year of resource. For White biology students, year 3 of inclusion produced a lower percent proficient than year 3 of resource.

For biology, West scored significantly lower than North and East during resource years. During inclusion years, West scored significantly lower than North and East in English 1. North scored significantly higher than East and West during resource years in algebra 1. However, there was no distinguishable difference in algebra 1 performance among schools during inclusion years. West scored significantly lower than North and East in English 1 during resource years. In addition, West scored lower than North in English 1 during inclusion years of the study. A 95% confidence interval added power to the statistical significance of the differences in mean EOC scale scores. The established confidence limits were also used to generalize the results from a sample mean to a population mean. ANOVA was used to see if differences existed by schools and to reject the null hypothesis.

Discussion of the conclusions was carried out. The implications of the study were presented. Recommendations for further research were shared.

References

The ABCs of Public Education. (2006). The ABCs: An overview. North Carolina Department of Public Instruction. Retrieved April 26, 2007, from http://www.ncpublicschools.org/docs/accountability/reporting/abc/2005-06/abcsbrochure.pdf

Co-Teaching Approaches. (2006-2007). Inclusive Practices Module. Retrieved August 2, 2009, from http://documents.cms.k12.nc.us/dsweb/Get/Document-15708/Co-Teaching+Approaches+6-07.ppt

Daam, C., Beirne-Smith, M., & Latham, D. (2001). Administrators' and teachers' perceptions of the collaborative efforts of inclusion in the elementary grades. *Education*, *121*(2), 331-338.

Edelson, D. (1998). Matching the design of activities to the affordances of software to support inquiry-based learning. School of Education and Social Policy and Institute for the Learning Sciences. Northwestern University. Retrieved July 19, 2009, from http://www.worldwatcher.northwestern.edu/userdownloads/pdf/Edelson_icis98.pdf

Ellet, L. (1993). Instructional practices in mainstreamed secondary classrooms. *Journal of Learning Disabilities*, *26*(1), 57-64.

Gall, M., Gall, J., & Borg, W. (2003). *Educational research: An introduction*. (7th Ed.). Boston, MA: Allyn and Bacon.

Gately, S., & Gately, F. (2001). Understanding co-teaching components. *Teaching Exceptional Children, 33*(4), 41.

Gordin, D., & Pea, R. (1995). Prospects for visualization as an educational technology. *Journal of the Learning Sciences, 4*(3), 249-279.

The Gurian Institute. (n.d.). Helping boys and girls reach their potential in single-sex classrooms, schools, and programs. Retrieved July 25, 2009, from http://www.gurianinstitute.com/SingleSexSchoolsMarketing.pdf

Healy, J. (1990). *Endangered minds: Why our children don't think.* New York: Simon and Schuster.

Hines, R. (2001). Inclusion in middle schools. *ERIC Digest.* Retrieved April 30, 2007, from http://www.ericdigests.org/2002-3/inclusion.htm?userid=Givesmart&userip=74.227.146.8…

Holloway, J. (2001). Research link/inclusion and students with learning disabilities. *Educational Leadership*, *58*(6), 86-88.

Hood, P. (1997). Simulation as a tool in education research and development. EdTalk: US.

Inclusion in Schools. (2001). Retrieved April 30, 2007, from http://student.plattsburgh.edu/bela6486/edu580/inclusion_in_schools.rtf

Intervention Strategies Guide. (2005). Mentoring Minds. Retrieved July 19, 2009, from http://www.mentoringminds.com/intervention-strategies-guide.php

Judge Manning's Report. (2005, May). Retrieved January 14, 2009, from http://www.wcnc.com/news/topstories/stories/wcnc-0525-AD-Judge_report.2ad32eae8.html

Keefe, E., & 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.

Leinhardt, G., & Pallay, A. (1982). Restrictive educational settings. Exile or haven? *Review of Educational Research, 52*, 557-578.

Lipsky, D. (1994). *The national study of inclusion programs*. National Center on Educational Restructuring and Inclusion. City University of New York.

Liston, A. (2004). *A qualitative study of secondary co-teachers.* Orange, CA: Argosy University.

LoVette, O. K. (1996). Inclusion: Who wins? Who loses? Northeast Louisiana University, Monroe, LA. Presented Annual Meeting Mid-South Educational Research Association.

Madden, N., & Slavin, R. (1983). Mainstreaming students with mild handicaps: Academic and social outcomes. *Review of Educational Research, 53*, 519-569.

Martson, D. (1996). A comparison of inclusion only, pullout-only, and combined-service models for students with mild disabilities. *Journal of Special Education*, *30*(2), 121-133.

Marzano, R., Pickering, D., & Pollock, J. (2001). Classroom instruction that works: Research-based strategies for increasing student achievement. Alexandria, VA: Association for Supervision and Curriculum Development.

Mastropieri, M., & Scruggs, T. (in press). Effective classroom instruction. In C. Spielberger (Ed.), Encyclopedia of Applied Psychology. Oxford, UK: Elsevier.

Mastropieri, M., & Scruggs, T. (2001). Promoting inclusion in secondary classrooms. *Learning Disability Quarterly, 24*(4), 265.

Mastropieri, M., Scruggs, T., 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*(5), 260-270.

Mastropieri, M., Scruggs, T., Mantzicopoulos, P., Sturgeon, A., Goodwin, L., & Chung, S. (1998). A place where living things affect and depend on each other. Qualitative and quantitative outcomes associated with inclusive science teaching. *Science Education, 82*, 163-179.

Models of Inclusion. (n.d.). Retrieved April 30, 2007, from http://www.slc.sevier.org/inclmods.htm?userid=Givesmart&userip=74.227.146.85&userag…

Murawski, W. W., & Swanson, H. L. (2001). A meta-analysis of co-teaching research: Where are the data? *Remedial and Special Education, 22*(5), 258-267.

National Center for Educational Statistics. (1999). The condition of education. Retrieved September 14, 2008, from http://nces.ed.gov/pubs99/condition99/pdf/section2.pdf

National Clearinghouse for Professions in Special Education. (n.d.). Who are special education students? Retrieved April 26, 2007, from http://www.special-ed-careers.com/career_choices/on_the_job/students.html

National Research Council. (1990). *How people learn: Brain, mind, experience, and school.* Washington, DC: National Academy Press.

Neubecker, M. (2003). *Simulation as an instructional tool. Encyclopedia of Educational Technology.* San Diego, CA: San Diego State University. Retrieved July 19, 2009, from http://coe.sdsu.edu/eet/articles/simulations/index

No Child Left Behind. (2003). Questions and answers on No Child Left Behind. U. S. Department of Education. Retrieved April 26, 2007, from http://www.ed.gov/nclb/accountability/schools/accountability.html

North Carolina Department of Public Instruction. (2005, 2006, & 2007). The ABCs accountability model. Retrieved June 24, 2008, from http://abcs.ncpublicschools.org

North Carolina "Green Book." (2009). Retrieved July 7, 2009, from http://www.dpi.state.nc.us/docs/acccountability/reports/green/greenbook0708.pdf

Osgood, R. L. (2005). *The history of inclusion in the United States.* Washington, DC: Gallaudet University Press.

Peterson, M., & Tamor, L. (2003). *Creating schools that work: Promoting excellence and equity for a democratic society.* Detroit, MI: Whole Schooling Consortium, Wayne State University. Retrieved July 24, 2009, from http://www.wholeschooling.net

Sharpe, W. (2000). Single-gender classes: Are they better? *Education World*. Retrieved July 23, 2009, from http://www.educationworld.com/a_curr/curr215.shtml

Single-Sex vs. Coed: The Evidence. (2006-2008). National Association for Single Sex Public Education. Retrieved July 23, 2009, from http://www.singlesexschools.org/research-singlesexvscoed.htm

Slavin, R., Cheung, A., Groff, C., & Lake, C. (2008). Effective reading programs for middle and high schools: A best-evidence synthesis. *Reading Research Quarterly, 43*(3), 290-322.

Smith, R. M. (1997). Varied meanings and practice: Teacher's perspectives regarding high school inclusion. *Journal for the Association of Persons with Severe Disabilities, 22*(4), 235-244.

Strategies to Improve Access to the General Education Curriculum. (2005). The Access Center. Retrieved July 19, 2009, from http://www.k8accesscenter.org/training_resources/documents/Research%20Supported%20Strategies%20chart.doc

Tomlinson, C. (2001). How to differentiate instruction in mixed-ability classrooms (2nd Ed.). Alexandria, VA: Association for Supervision and Curriculum Development.

Turner, N. (2003). Preparing pre-service teachers for inclusion in secondary classrooms. *Education, 123*(3), 491.

United States Department of Education. (2009). Office of elementary and secondary Education. Retrieved January 14, 2009, from http://www.ed.gov/admins/lead/account/cornerstones/nc.pdf

Villa, R., Thousand, J., Nevin, A., & Liston, A. (2005). Successful inclusive practices in middle and secondary schools. *American Secondary Education, 33*(3), 33-47.

Volonino, V., & Zigmond, N. (2007). Promoting research-based practices through Inclusion? *Theory Into Practice, 46*(4), 291-300.

Walther-Thomas, C. S. (1996, July). Planning for effective co-teaching: The key to successful inclusion. *Remedial and Special Education.*

Walther-Thomas, C. S. (1997, July/August). Co-teaching experiences: The benefits and problems that teachers and principals report over time. *Journal of Learning Disabilities.*

What is the Impact of Inclusion on Students and Staff in the Middle School Setting? (1999). (NMSA Research Summary No. 14). Retrieved June 18, 2008, from http://www.ncmsa.net/ressum14.htm

Zigmond, N., & Magiera, K. (2001). Current practice alerts: A focus on co-teaching: Use with caution. *Alerts, 6*, 1-4.

Appendix

Table 2 Terms

The terms that follow are defined by using the www.ncpublicschools.org website.

Growth is calculated by following individual students' academic performance from the end of one school year to the end of the next school year. It can be Expected (Exp) or High (Hgh) growth.

Performance composite measure indicates the percentage of students who scored proficient on end-of-grade or end-of course tests.

Adequate Yearly Progress (AYP) measures the yearly progress of different groups of students at the school, district, and state levels against yearly targets.

ABCs is North Carolina Accountability Model. The basis is strong accountability; teaching the basics with an emphasis on high educational standards; and maximum local control.

Status represents the ABCs Accountability System's recognitions and designations that are based on growth and performance standards for each elementary, middle, and high school in North Carolina.

Schools of Distinction (Dst) made at least expected growth and had at least 80 percent of students' scores at or above Achievement Level III but did not earn one of the top two designations.

Low-Performing Schools (LP) failed to meet expected growth standards and have less than 50 percent of their students' scores at or above Achievement Level III.

Priority Schools (Pri) have less than 60 percent of their students at or above Achievement Level III, irrespective of making their expected growth standards and are not Low-Performing Schools.

Schools of Progress (Pro) made at least expected growth and had at least 60 percent of their students' scores at or above Achievement Level III, but did not qualify for the top

three designations.

Schools Receiving No Recognition (NR) did not make their expected growth goals and had at least 60 percent of their students' scores at or above Achievement Level III.