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A Comparison between READ 180 Students and Non-READ 180 Students Reading and Math Scores by Classroom Structure.

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A Comparison between READ 180 Students and Non-READ 180 Student's Reading and Math Scores by Classroom Structure

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by

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ABSTRACT

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The purpose of this study was to compare the achievement of students in reading-language arts and math, who participated in the Scholastic READ 180 program within self-contained classroom organizations with the achievement of READ 180 students within departmentalized classrooms and with students not enrolled in READ 180. Classroom organizational structure at the intermediate grade is a highly debated issue. The READ 180 program is a highly structured model of the reading-language arts block. However, past research has provided few recommendations on how to schedule classes for at-risk students. Teachers and administrators of intermediate school students will benefit from a quantitative study that evaluates the relationship between classroom organizational structures and the success of READ 180 students.

Eight research questions guided the study. One-way and two-way ANOVAS were used to evaluate the relationships between the variables. Tennessee Comprehensive Assessment Program (TCAP Reading-language arts and TCAP Math), Discovery Education (DE Reading-language arts and DE math), and Scholastic Reading Inventory (SRI) test scores were compared with regard to gender. The results of the data analyses indicated no significant difference in DE reading and SRI test scores among the 3 classroom organizations. However, there was a significant difference in DE Math,

TCAP reading, and TCAP math scores with regard to classroom organization. Non READ 180 students tended to have higher means than either READ 180 self-contained or READ 180 departmentalized students. When the analyses included only READ 180 students, no significant interaction was found between classroom organization and gender. Also no significant differences were found between male and female students and no significant difference was found between self-contained and departmentalized classrooms.

DEDICATION

This work is dedicated to God, my family, and my students. God gave me the drive and will power to persevere. My husband and son provided me with continuous encouragement and support and gave up many hours of their time for me to work. My parents instilled in me a desire to be a lifelong learner. My students inspire me every day to be the best teacher I can be and to continue searching for ways to help them learn.

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CHAPTER 1

INTRODUCTION

Reading is a critical skill to the future of all students. Teachers have been attempting to teach children to read for hundreds of years. The ancient Greeks and Romans used the alphabet method to teach citizens to transact business. Even at this early time, there was disagreement about the best method to teach reading; Sadoski (2004) wrote that Socrates believed the use of the alphabet would destroy the use of memory in learning. Socrates used only oral language and wrote nothing. Later, during colonial times in America reading instruction was strictly a religious mission. Over the years the objectives to educate readers have changed as many times as the methods being used.

The McGuffey Readers and Gray's *Dick and Jane* series laid the foundation for the basal readers of 20th century (Sadoski, 2004). Teachers now use a wide variety of practices to foster effective learning. Listening, oral expression, reading, and writing all factor into the fluent reader equation. Modern teachers use methods such as ability grouping, whole language, phonics, and research-based programs (Sadoski, 2004)

Parents, teachers, administrators, and community members all desire students to progress through the local school system with the ability to read. However, Erickson (2008) pointed out that not all children learn at the same rate. Some students fall behind and teachers struggle with how to help them be successful. The good news is that research indicates that 90% to 95% of reading-impaired children can overcome

their difficulties if they receive appropriate intervention at an early age (Drummond, 2005).

At-risk students need to be identified early and intervention applied as soon as possible. Schools must have a plan for how to help those at risk of failing to read on grade level. Not all elementary teachers are properly trained in reading instruction. Teachers need to provide students with skills such as word decoding, prediction making, reviewing text, and finding meaning within context. Adequate training in the instruction of these skills is necessary for effective reading teachers. Schools and school systems need to focus on teacher training for those who will work with at-risk readers.

Many at-risk readers are also at-risk math students. It is hard for students to solve math word problems containing terms and phrases that are unfamiliar to them. The National Council of Mathematics Teachers (1989) recommended that students need the opportunity to read, write, and discuss ideas using the language of mathematics. This means students need to learn to read two distinct yet related languages. According to McIntosh and Draper (1995) the language of mathematics is often deficient in developmental reading students. Struggling readers are confused and distracted by everyday language, math words, or combinations of both; they may know how to do the necessary math operations yet not understand clearly what the question is asking them to do. Jordan, Kaplan, and Hanich's (2002) longitudinal study found reading abilities influence children's growth in mathematics, but mathematics abilities do not influence children's growth in reading.

Over the years reading programs and computer software have been used by school systems to aid struggling readers. Effective intervention programs usually provide prereading activities, model active reading, strategies for word recognition, and reading for meaning strategies (Huitt, 2000). Several popular reading intervention programs have been highly successful, and school systems have budgeted large amounts of money to purchase them. However, lack of training and teacher dedication to the program has led to many of these programs being underused. READ 180, Success for All, Winston-Salem Project, and Boulder Program are current intervention programs.

The READ 180 program according to Scholastic (2010) has had a positive impact on student achievement across multiple grade levels in 37 different studies. Hasselbing's (2000) study of Scholastic's READ 180 revealed significant growth on multiple measures of reading comprehension. The Scholastic program is adapted for students reading below proficiency in grades 4 through 12. The instructional model is a systematic approach for whole and small group instruction. The highly structured environment of the READ 180 program does not address the classroom organization for the rest of the child's academic day. Students are assigned to either a self-contained classroom or a departmentalized one. A self-contained classroom consists of one instructor who acts as a generalist and is responsible for all instruction. Another approach, departmentalization, is a structure in which students move to different teachers for instruction in different subject areas (Rust & McGrath, 2002).

Statement of the Problem

According to the National Center for Education Statistics (NCES) in 2009 25% of all adults were functionally illiterate. Nationally, 36% of fourth graders score below basic in overall reading skills (NCES, 2009). School systems were committed to applying practices supported by research to help these students who fall behind. When children fall behind they need concentrated intervention to bridge the gap. The purpose of this study was to compare the achievement of fourth and fifth grade students in reading-language arts and math who participated in the Scholastic READ 180 program from self-contained classroom organizations with the achievement of READ 180 students from departmentalized classrooms and with fourth and fifth grade students not enrolled in READ 180. Scores from the Tennessee Comprehensive Assessment Program (TCAP), the Student Reading Intervention (SRI), and the Discovery Education (DE) tests for self-contained READ 180 students were compared to those of students in departmentalized READ 180 classrooms and students not enrolled in the READ 180 program. Also, reading-language arts scores from TCAP, SRI, and DE tests were compared with regard to male and female students.

Research Questions

The following questions were used to guide the study:

1. Are there significant differences in the 2009-2010 students' improvement scores (posttest minus pretest) in reading-language arts as measured by the Discovery

Education Assessment (DE) with regard to classroom organization? (READ 180 self-contained, READ 180 departmentalized, Non-READ 180)

2. Are there significant differences in the 2009-2010 students' improvement scores (posttest minus pretest) in reading-language arts as measured by Student Reading Inventory (SRI) with regard to classroom organization? (READ 180 self-contained, READ 180 departmentalized)
3. Are there significant differences in the 2009-2010 students' scores in reading-language arts as measured by the Tennessee Comprehensive Assessment Program (TCAP) with regard to classroom organization? (READ 180 self-contained, READ 180 departmentalized, Non-READ 180)
4. Are there significant differences in the 2009-2010 students' improvement scores (posttest minus pretest) in math as measured by DE with regard to classroom organization? (READ 180 self-contained, READ 180 departmentalized, Non-READ 180)
5. Are there significant differences in the 2009-2010 students' scores in math as measured by TCAP with regard to classroom organization? (READ 180 self-contained, READ 180 departmentalized, Non-READ 180)
6. Are there significant differences regarding only READ 180 students' 2009-2010 improvement scores (posttest minus pretest) in reading-language arts as measured by the DE with regard to classroom organization and between male and female students?
7. Are there significant differences regarding only READ 180 students' 2009-2010 improvement scores (posttest minus pretest) in reading-language arts as

measured by the SRI with regard to classroom organization and between male and female students?

8. Are there significant differences with regard to only READ 180 students' 2009-2010 in reading-language arts as measured by the TCAP with regard to classroom organization and between male and female students?

Significance of Study

Classroom organizational structure at the intermediate grades level is an unresolved issue. The READ 180 program is a highly structured model of the teaching of reading. However, there are no recommendations on how to schedule classes for at-risk students. Teachers and administrators of intermediate school students will benefit from a quantitative study that evaluates the relationship between classroom organizational structures and the success of READ 180 students.

Definition of Terms

1. Discovery Education Assessment (DE) - an assessment developed by Vanderbilt University to improve student achievement and predict performance on TCAP. It is designed to predict student performance in reading and math. (Discovery Education Assessment, 2011).
2. Lexile Framework – a reading measure that matches students to text. It provides information about an individual's reading ability and the difficulty of a text. The

Lexile measure is provided as a number with an "L" after it - 880L is 880 Lexile (Scholastic READ 180, 2010, program overview page).

3. READ 180- an intensive reading intervention program designed to meet the needs of students whose reading achievement is below the proficient level. The program addresses individual needs through software, high interest literature, and direct reading instruction (Davidson & Miller 2002).
4. Student Reading Inventory (SRI)- a reading assessment test for grades 4 -12 that assesses students' reading levels and helps teachers adjust instruction according to the students' needs, track student reading growth over time, and match readers to reading material (Scholastic READ 180, 2010, program overview page).
5. Tennessee Comprehensive Assessment Program (TCAP) – a criterion – referenced assessment system designed to measure concepts, processes, and skills taught throughout the state using a series of interconnected assessments, (TB/McGraw-Hill, 1996).

Limitations and Delimitations

The participants in this study were delimited to 42 self-contained READ 180 students, 140 departmentalized READ 180 students, and 100 non-READ 180 students, focusing on fourth and fifth graders in the subject areas of math and reading-language arts. A limitation is that only two READ 180 classrooms use the self-contained organization model. Another limitation is that READ 180 has a maximum class size of 21, whereas other fourth and fifth grade classrooms have a maximum of 25 students.

Only scores of these students were analyzed: therefore, generalizations may not be possible to other systems. The assumption was made that all READ 180 teachers were properly trained and follow the model set by Scholastic.

Overview of Study

This study is organized and presented in five chapters. Chapter 1 includes an introduction, the statement of the problem, research questions, and the significance of the study, limitations, delimitations, and definitions of key terms. Chapter 2 contains a review of literature pertaining to READ 180, classroom organization models, and the types of tests to be used. Chapter 3 includes the population, research design, instrumentation, method of data analysis used, and the method of data collection. Chapter 4 presents the analysis of data and the results. Chapter 5 contains a summary of the findings, the conclusions, and recommendations for further study.

CHAPTER 2

REVIEW OF LITERATURE

The need to communicate by written expression has been around as long as people have been transacting business. Ancient Greek and Roman teachers used the alphabet method to educate business citizens to read. They used drill and practice with songs and alphabet blocks to aide in memorization (Sadoski, 2004). Modern teachers continue to use aspects of the alphabet method .

In early America the alphabet method was still a popular way to teach reading. However, the reasons for reading instruction had changed. Lessons were religious in nature. Primers, our earliest reading books, were full of religious content. Lessons were performed orally with an emphasis on accuracy (Sadoski, 2004). Monaghom (2005) maintained reading was more valuable than writing because it provided access to the scriptures. The colonists endured the dangers of the ocean crossing in search of economic betterment and religious freedom. The alphabet method provided children access to that better life (Monaghom, 2005).

In the 1800s the word method and the phonic method began to gain popularity. William H. McGuffey, a Midwestern professor, authored the McGuffey readers. These readers were the first carefully graded series of books containing one book for each elementary grade (Sadoski, 2004). After this time greater emphasis was placed on meaning and comprehension than on just word decoding.

The first standardized tests of the early 20th century prompted investigations into how best to teach children to read. In 1915 researchers found silent reading was superior to oral reading in all testable areas (Sadoski, 2004).

The mid-20th century brought the era of basal readers. The *Dick and Jane* series by Gray was an effective system for introduction and reinforcement of words (Sadoski, 2004). Sadoski found that in the 1960s 90% of all elementary school students learned to read from a basal reader. These readers have made cultural progress especially in the areas of ethnic and racial diversity and more use of literature but are still the foundation of reading instruction in America. Modern basals are complete reading curriculums including phonics, systematic approaches to skills, and supplementary material. Smith (1997) claimed effective reading systems must follow the natural sequence for teaching language arts: listening, oral expression, reading, and handwriting.

According to Sadoski (2004) the Greek philosopher Socrates believed that the use of the alphabet would destroy the use of memory in learning. He used only oral language and wrote nothing. The debate over how to best teach reading is still relevant. The Socratic Method was used by educators to question students in a manner requiring them to consider how they rationalized and responded to topics. Copeland (2005) explained that the goal of the Socratic Method was to help students process information and engage in deeper understanding of what is being read. It engaged teachers and students in dialogue that was collaborative and open minded as opposed to debate. Copeland suggested by using this method to process reading passages students develop critical and creative thinking skills.

Modern educators, experts, and parents cannot agree on the best approach. There are many modern methods, all of which have proponents who maintain their particular approach is the key to engaging children in reading. Cromwell (1997)

contended that as arguments over methods intensify the ability to read well has become more critical than ever.

Modern teachers employ strategies when instructing students in reading. Methods such as whole language, ability grouping, and phonics are being used in classrooms across the U.S. Although there are many strategies in use to teach students to read, some students still fall behind grade level. According to the National Center for Educational Statistics (2009), 36% of fourth graders read below the basic level. Failing to read at a basic level can be life changing for those students. This group of students is substantially more likely to drop out of school than their reading peers. Many school systems are implementing reading intervention programs to confront this problem.

Teacher certification programs are charged with preparing teachers to meet the needs of a diverse student population (Barnyak & Paquette, 1995). New teachers enter classrooms with a variety of instructional practices at their disposal. However, Barnyak and Paquette (1995) found preservice teachers often use the strategies they were taught when in elementary classrooms. This practice often overlooked research-based strategies that work in classrooms. This provides a challenge for college instructors and professors to overcome misconceptions about the teaching of reading.

Moore (2008) suggested that the passage of NCLB in 2003 and the implementation of Annual Yearly Progress (AYP) put teachers under pressure more than ever to improve student achievement and close learning gaps. This is more important in the content area of Reading and Language Arts because those who are proficient in reading are more likely to be proficient in other areas (Moore, 2008).

Hasirci (1999) stated that the education a child received in elementary school is an important stage in interacting and developing relationships with others, adopting new reference groups, and developing new standards by which to judge themselves. He proposed that the school environment as well as the design and organization of classrooms affects learning and contributes to the overall impact of the development of the student. This understanding of how children learn and how the environment impacts that learning may be a factor in obtaining AYP (Hasirci, 1999).

Whole Language Instruction

Over the past 40 years one of the most widely recognized reading instruction methods has been the whole language approach. Sherman and Ramsey (2006) defined whole language as a transaction, not an extraction of the meaning of print. In transactional models words do not have specific meanings that are reader created. Goodman (1992) claimed it is a concept encompassing both a philosophy of language development and instructional approaches within that philosophy.

Although not a pure example of whole language, the *Dick and Jane* series of the 1930s taught students to learn words as meaningful *wholes* rather than breaking them down into letter or sound parts. In the whole language approach students find meaning within presented texts. Phonics was not a part of the curriculum. Since the 1980s, this method has been the correct way to teach reading instruction in colleges across the U.S. (Sherman & Ramsey, 2006).

Riley (2006) wrote that whole language classes provide many opportunities for students to interact with story books. He observed daily shared reading, read alouds,

silent reading, and high interest discussions. Critical skills such as phonemic awareness, phonics, vocabulary, reading fluency, and comprehension were learned through exposure to reading and writing activities, not through skill practice.

Ponce (1998) pointed out that the whole language method requires teachers to read to students, have students read out loud, predict what will happen next, and even make up spellings as they write their own stories. He proclaimed the whole language approach a developmental process that surrounded children with books and adult readers allowing them to discover the relationship between words and sounds. Ponce went on to explain reading instruction should not be a debate about whole language versus phonics; it should be a consensus of the basic principles of both.

Jeynes and Littell (2000) defined pure whole language as instruction with no adapted texts, no whole class teacher sponsored assignments, and integrated language experiences as opposed to direct instruction in isolated skill sequences. They found classrooms with these strict guidelines indicated the strongest advantages in test scores, with less pure versions having weaker or negative results.

Because of the vital nature of the ability to read, teachers and administrators are under increasing pressure to raise test scores. According to the International Reading Association (IRA) in 1996 the teaching of phonics is an important aspect of beginning reading instruction. They found classroom teachers in the primary grades do value and teach phonics as part of their reading programs. Phonics instruction, to be effective in prompting independence in reading, must be imbedded in the context of a total reading-language arts program. The IRA promoted the position that no one approach to teaching reading and writing is best for every child.

Church and Newman (1985) asserted visual, tactile, and global learners do well in whole language classrooms and analytic learners struggle. Goodman (1993) maintained a successful whole language program teaches strategies rather than skills. He asserted students are offered a strategy teaching a skill in a broader context as students need that specific skill. This eliminates a predetermined sequence of skills.

Stahl and Miller (1989) found whole language was not particularly effective with children labeled as disadvantaged. They asserted disadvantaged children need more than a whole language classroom can provide. Children who grow up in homes with higher socioeconomic status have access to print materials and environments where spoken and written language is important. These children already know how to negotiate literacy rich environments such as a whole language classroom (Goodman, 1992). Whereas students who grow up in a low literacy based home have fewer opportunities to interact with books, they are not read to, and have few educational based games. These students are not as comfortable with the abundant print materials in a whole language class.

Delpit (1988) argued children raised in nonmainstream cultures are not exposed to the power code or the language used by people in power. When whole language teachers accept nonmainstream dialect as correct, they deny students knowledge they need to be successful in a middle class dominated world. This was emphasized in Teale's (1984) study of children who had virtually no experience with storybooks prior to first grade. When comparing those children to students who were read to for 30 to 45 minutes per day, they were 3,000 hours behind their peers before entering the first grade.

Stahl (1999) found by not grouping students in reading groups, whole language classes provided a more positive atmosphere for struggling readers. However, he also found drawbacks of the unwillingness of teachers to push children. In the whole language classroom children are often allowed to choose which material they are comfortable with and self-esteem is emphasized. According to Stahl this leads to children learning to read relatively easily but not advancing in vocabulary or comprehension. In a traditional setting achievement is stressed by pushing students to read more and more difficult material.

Ability Grouping

According to Hallahan and Kauffman (1991) ability grouping of students is one of the oldest issues in public schools. There are two common types of groups: between class and within class grouping. Between class grouping is the practice of a school forming classes that have students with similar abilities. Within class grouping is when the classroom teacher creates groups of students with similar abilities within the class (Hallahan & Kauffman, 1991).

The Joplin Plan is a grouping plan assigning students to heterogeneous classes for most of the day but regroups them across the grade level for reading instruction. Slavin (1989) maintained the Joplin Plan provided strong evidence of increasing reading achievement. Slavin also reviewed classrooms that are self-contained on the basis of ability. His evidence suggested this type of grouping does not enhance achievement in elementary schools.

With increasing pressure to produce higher test scores, teachers make every attempt to provide appropriate levels of reading instruction to all levels of students. The most common strategy is ability grouping. Students are assigned to a classroom according to a general performance level. Goldberg, Passow, and Justman (1966) defined homogeneous grouping as the classification of pupils for the purpose of forming instructional groups having a relatively high degree of similarity in regard to certain factors affecting learning.

The theory is if the number of ability levels is reduced, the teacher will be able to more accurately accommodate instruction to students' needs. With ability grouping teachers have fewer planning needs. Kelm (2002) pointed out there are more opportunities available to meet the needs of all children when they are grouped according to reading ability.

However, homogenous grouping has its opponents. Bailey and Bridges (1983) argued that grouping merely disguises differences in abilities and is unable to stretch the brightest students as well as allowing learning disabilities to go overlooked. They contended teachers rely too heavily on the process of grouping instead of respecting each individual's ability. Goldberg et al. (1966) suggested it is not the grouping itself, rather the change in other factors made by the teacher, such as: curriculum adaptation, teaching methods, materials, ability of the teacher to relate to children, and other subtle variables.

Phonics

Decoding words is a fundamental skill when learning to read. The systematic approach to decoding words is called phonics. Phonics instruction is a way of teaching reading stressing letter-sound correlations and their use in reading and spelling. The focus is to help beginning readers link sounds to letters. New enthusiasm was brought to phonics instruction with the introduction of Sesame Street. The program directly delivered sound and letter instruction in a fun format (Sherman & Ramsey, 2006). Phonic skills are important, some have argued for children to become independent and fluent readers. However, Clay (1985) maintained this skill has little value unless children also learn how to make use of it in context.

There are three components to teaching phonics: phonemic awareness, letter-sound relationships, and exposure to the meanings of the written word. According to Manning, Manning, and Long (1989), phonics instruction is necessary to produce higher test scores. Often, these test score are from standardized or criterion referenced tests, that cannot adequately assess students' ability to read. The teaching of phonics has been a controversy since Reudolf Flesch's 1953 book *Why Johnny Can't Read* (Manning et al., 1989).

Opponents of phonics based reading instruction point to the complexity of phonics rules. Cromwell (1997) concluded that many rules for decoding words simply do not work very well. For example, the final-e rule works in only 63% of the cases and the *when two vowels go walking the first one does the talking* rule works only 45% of the time. Kelm (2002) also claimed the rules of phonics are complex and have

numerous exceptions. Whereas, Sherman and Ramsey's (2006) research found more than 90% of English words are phonically regular.

Newman and Church (1990) reported analytic learners feel disorganized in whole language instruction and need a more skills based approach like phonics. They also point out many combinations are necessary to provide an optimal learning environment for the majority of readers. Goodman (1993) suggested phonics opportunities are available in whole language instruction during shared reading, shared writing, writing aloud, self-selected writing, and guided reading.

Classroom Organization

The way teachers organize their classrooms may go a long way toward producing an effective learning environment. Classroom management, climate, and environment are all important elements of the organization. The structure of the class is also important in student achievement. Self-contained, departmentalized, open-space, and team teaching structures are all methods used in modern classrooms (Froyen & Iverson, 1999).

Classroom Management

According to Marzono, Marzono, and Pickering (2003) one of the most important roles of a teacher is that of classroom manager. They claimed effective teaching and learning cannot take place in a poorly managed classroom. Wong and Wong (2005) noted effective teachers manage with procedures and routines, while ineffective teachers use threats and punishments. They explained how learning to manage a

classroom requires careful planning and consistency. The Wongs described a procedure as something the teacher wants done, and a routine as something the students do automatically.

Students feel safe with established routines. Froyen and Iverson (1999) stated by integrating knowledge about human diversity and individuality into their instructional philosophy, teachers could manage their classrooms in a more effective way. They pointed to research that indicated the importance of assisting students with positive behaviors.

Froyen and Iverson's (1999) research found by integrating knowledge of human diversity through conduct management teachers could manage their classrooms in a better, more effective way. Teachers should consider an assertive communication style when planning classroom management. They should consider what they want their students to do and engage them in learning activities under general conditions of clearly and explicitly stated classroom rules. Positive behaviors of conduct management are created as a foundation for an orderly and task oriented approach to teaching and learning. This foundation allows students greater interdependence and autonomy through socialization (Froyen & Iverson, 1999).

Froyen and Iverson (1999) also stressed the following components of an effective conduct management plan: acknowledging responsible behavior, correcting irresponsible or inappropriate behaviors, ignoring, proximity control, gentle verbal reprimands, delaying, preferential seating, time owed, time out, parental notification, behavior contracts, setting limits outside the classroom, and reinforcement systems. All

of these positive behaviors are components identified as examples of best teaching practices.

Mutual trust between teachers and students is key to allowing students to becoming coparticipants in the teaching and learning process. They claimed this process to be a key component in building quality schools through teacher effectiveness and student achievement. In effect these teacher and student relationships are essential to positive school and classroom environments (Froyen & Iverson, 1999).

A key to a productive classroom is effective classroom management. Managing behavior issues and time allotted for learning provides and environment conducive to learning. There are many management techniques available to teachers. Good and Brophy (1987) listed problem prevention, problem solving, assertive discipline, the Least Approach, and behavior modification strategies as proven behavior plans. Problem prevention is a proactive approach involving planning and setting up the classroom for good behavior. Moore (2008) reported teachers who used assertive discipline make clear expectations and plan consequences. This behavior modification technique is based on the theories of B.F. Skinner, who promotes rewarding good behavior. The Least Approach by Carkuff (1981) provided an acronym for teachers to be able to quickly assess a behavior and make a decision about how to handle it. The steps were:

L-leave things alone when no problems are likely to occur
E-end the action indirectly when behavior is disrupting
A-attend more fully when you need to obtain more information
S-spell out directions when disruptions occur
T-track student progress when following through to evaluate (preface)

According to Bull and Solity (1987) there was a strong need for consistency in a teacher's management over time with different students. This consistency can be

provided when teachers plan positive management of events and consequences through a framework.

Time on Task

According to Marston (1989) in 2006-2007 the average U.S. student spent 101 minutes per day in language arts, 65 minutes in mathematics, 36 minutes in social studies, 36 minutes in science, 22 minutes in art and music, 21 minutes in physical education, 28 minutes at lunch, and 27 minutes at recess. Research by Clariana (1992) demonstrated that increased time on task increases learning. Because of this relationship between time and learning, time is a significant limiting factor in schools (Clariana, 1992). According to Levin and Nolan (1996) two components of time on task affect classroom management; time allocated to teaching a subject and time students spend actively engaged in learning. This time is often compromised by administrative needs, announcements, and other interruptions.

Providing effective classroom management allows for more productive time on task. Slavin (1989) addressed the need for teachers to be concerned with the time needed and the time spent on each instructional objective. Optimum classroom management during class time as well as during transition preserves time on task.

Classroom Climate

Marshall stated: “adding wings to caterpillars does not create butterflies-it creates awkward and dysfunctional caterpillars. Butterflies are created through transformation” (as cited in Ollerton, 2004, introduction page). Johnson and Johnson

(1991) defined climate as the way in which people within the classroom interact with each other. A student who is comfortable in the classroom is at ease to learn. Wheeler (2010) asserted peace and caring in the classroom provides stability for students who may not have stability in the rest of their life. Classroom environments have many examples of relationships. Relationships between students, and between students and teachers are all at play in all learning environments. According to Brown, Jones, Larusso, and Aber (2010), these relationships consist of cultural norms, values, and practices of all involved. The climate of the class is based on these interactions. A teacher's style of communication, the way students are treated, and how instruction is presented all affect the climate of the room.

Aleman and Taylor (1997) argued both the classroom and the school climate reflect the influence of a school's culture, which is shaped by the school's surrounding context for example home, neighborhood, city, and state. Higgins's (1991) research suggested relationships between climate and elements such as student engagement, behavior, self-efficacy, achievement, social and emotional development, principal leadership style, stages of educational reform, teacher burnout, and overall quality of school life. The study reported strong associations with achievement levels and classrooms that have greater cohesion and goal-direction with less conflict and disorganization.

Mahoney and Ilextall (2000) described a proactive approach to developing a positive classroom climate. They advocated:

- A welcoming, caring and hopeful atmosphere
- Social support mechanisms for students and staff

- An array of options for pursuing goals
- Meaningful participation by students and staff in decision making
- Transforming a big classroom into a set of smaller units that motivate intrinsic motivation for learning and are not based on ability or problem-oriented groups
- Providing instruction and responding to problems in a personalized way
- Use of a variety of strategies for preventing and addressing problems as soon as they arise
- A healthy and attractive physical environment that is conducive to learning and teaching, (pg. 84).

Classroom Environment

Young (n.d.) described a classroom as a *home away from home* for the teacher and the student. She encouraged teachers to be aware of the grade and age level appropriateness, the type of classroom activities, and the teacher's particular style when setting up a classroom for learning. The physical aspect of a classroom can enhance or hinder the learning environment. Parkay and Stanford (2007) stated that the environment of a classroom can affect the quality of the student and teacher relationships. Items such as lighting, temperature, spacing, accessibility, acoustics, and availability of materials are environmental issues making a classroom a comfortable place that is conducive to learning. Draves (1995) noted four key elements of the physical learning environment: the room (space, desks, furniture, paint, cleanliness, and noise), the tools (books, a board, maps, hands-on materials), the natural

environment (temperature, time of day, lighting), and learning mediums (having enough supplies on hand). Teachers who take these elements into account when planning lessons are more successful (Parkay & Stanford, 2007). Bull and Solity (1987) asserted organizing a classroom so the spacing of individuals avoids crowding and jostling helping to prevent conflict and ensures higher levels of attention. Much research has yielded that the physical aspect of a classroom is important to the learning that takes place within.

Classroom Structure

The way in which classrooms are organized has an immediate impact on students' educational experiences (Montgomery & Rossi, 1994). Self-contained, departmentalized, individualized instruction, and team teaching are common structures used in many modern classrooms.

Self-Contained Classroom

Snyder (1960) described the self-contained classroom as a curricular plan in which one group of students and one teacher are together for a major portion of the day. These classrooms have their roots in the classrooms of village schools of the past (Smith, 1997). In such classrooms one teacher is responsible for most all of the academic material and instruction of core subjects. The teacher manages the day to maximize time on task and classroom management issues. In this organization the teacher has to be a subject generalist but is able to develop personal relationships with students (Snyder, 1960). Snyder also maintained this type of organization provides

flexibility in programming and encourages creativity. Research comparing self-contained classes with open space classes reveals open space students averaged 10 percentage points behind self-contained students in reading (Kilday, 1980). However, Lambert, Wiersma, Goodwin, and Robert (1964) found there was no significant difference in student achievement, teacher awareness, absenteeism, frequency of discipline infractions, or changes in social structure in self-contained classes versus team teaching situations.

A study by McGrath and Rust (2002) of fifth and sixth graders found students in self-contained classrooms made significant gains on the TCAP in total battery and language and science subtests. However, there were no significant differences in math, reading, or social studies subtests. Chan (2004) found students who have been identified as gifted and are in self-contained settings score higher in this environment. Students report the ability to be themselves without fear of social implications. Alternatively, Bull and Solity (1987) reported in four out of five groups of students who transitioned from self-contained to a departmentalized structure, experienced a significant decline in their reading and math scores.

Proponents of self-contained classroom organizations claim it provides for greater teacher acquaintance with each child, more flexibility in time allotments, and better correlation and integration of subject matter. This type of organization avoids the necessity of the child adjusting to more than one teacher. However, opponents argue that expecting all teachers to teach all subjects is unrealistic (Bull & Solity, 1987).

Departmentalized Classrooms

Parkay and Stanford (2007) defined departmentalized classroom organization as a plan where students study four or five subjects taught by teachers who specialize in those subjects, students move from teacher to teacher. According to Montgomery and Rossi (1994) this organization is usually found in middle and high schools. Their research showed by departmentalizing the number of class preparations required by the teacher was lessoned significantly, as well as departmentalized classes promoted subject interest by students. McPartland (1992) suggested this type organization allows teachers to become specialists in the subject they teach, allowing them to design higher quality lessons. A concern of parents is children will not receive the nurturing provided in a self-contained classroom. McPartland (1992) found some instructional benefits of departmentalizing, however, the younger the student, the less the benefit.

Calhoon (2010) reported the departmentalized structure as the standard for secondary schools since they were established. He suggested it is now being used in elementary and middle schools to contribute to a more successful transition to high school. Moore's (2008) research revealed no significant differences in fourth and fifth grade scores in language arts, science, and social studies between students in self-contained and departmentalized classrooms. He found fourth grade scores in math to have no differences. However, fifth grade math achievement scores in departmentalized classrooms were significantly higher.

Open Space Classroom

According to Parkey and Stanford (2007) an open space classroom is one in which students work independently with a number of teachers providing individual assistance. This structure usually takes place in large spaces without walls. The open space classroom began in English infant schools in the 1960s (Barth, 1972). These classrooms promoted self-determination and open education. Silberman (1973) studied the effects of open space structure on student's feelings of self-confidence, work habits, and desire to work. The results found the claims of higher levels of each to be unsupported.

Reading Mathematics

According to Nichols (2003) math is a gatekeeper course. He found failing a year of math is highly related to failures in future years of school and difficulty in finding gainful employment. Heck and Van Gastel (2006) maintained failure in math is a common cause of college dropouts, with colleges spending significant resources on math remediation. Data from ACT (2004) established that 1.2 million tested (of students who thought they were ready for college) only 40% were ready for their first course in college Algebra. Haycock (2003) suggested: "We as educators have learned that courses like Algebra II are the pathways to higher education, we must now come to understand that they are also the pathways to well-paying jobs as well" (forward).

Adams (2003) found many reading teachers have complained their students cannot perform on grade level because they cannot read; however, math teachers do not have this complaint. She defined mathematics as the language people use to

communicate, solve problems, engage in recreation, and to create works of art and mechanical tools. She described it as a language of words, numerals, and symbols that are at times interrelated and other times autonomous. Fuentes (1998) noted mathematics is difficult because problems are not always read left to right, letters are no longer part of words, punctuation serves different purposes, numerous symbols are used, and words students already have in their vocabularies take on different meanings when applied to math concepts.

In 1944 Treacy reported significant relationships between several aspects of reading and mathematics performance. According to the National Council for Teachers of Mathematics one of the main principles of the Twenty-First Century mathematical educational vision is equity. Equity means all students should have opportunities to read, write, and discuss ideas where the use of the language of mathematics becomes natural.

Relationship Between Reading and Math

Gunning (2003) suggested one third of errors by low achieving math students were actually reading issues. Students misinterpreted words or had difficulty with the relationships of symbols and words. However, the National Center for Research on Teacher Learning (1992) revealed teachers tend to believe that mathematics is not connected to other disciplines or daily life, including reading and language arts. According to Benbow (1993) elementary school teachers believe mathematics to be a static set of rules and algorithms to be memorized and for most problems one correct method exists to find the one right answer.

Brennan (1985) argued reading mathematics is a meaningful interpretation of printed symbols, picture, graphs, charts, and tables. He maintained to read mathematics students must learn to integrate basic reading skills and other skills like computational and thinking skills. This integration can be quite complicated. Brennan identified three reasons why students sometimes have difficulty with this process. First, mathematics materials for a particular grade may require higher reading skills than the average student. Second instruction in reading mathematics is not sufficient in most cases. Finally, reading skills are not taught in a way that allows transfer of these skills to mathematical concepts.

Edward, Maloy, and Verock-O'Loughlin's (2002) claimed students in elementary school must learn two distinct, yet related languages, one of numbers, the other of words. Word problems combine both of these languages. Fuchs and Fuchs (2002) reported young readers are confused and distracted by combinations of everyday language and math words. Math problems, which are a key component of math achievement tests for all students, contain combinations of text and numbers with considerable amounts of information to decode and organize. Nelson (1999) provided an example of this possible confusion, the word problem: A teacher puts 28 sheets of paper in four notebooks. How many pages are in each notebook? A majority of students will multiply because it looks a lot like an *in all* question and the students do not understand the concept of equal groups. Edwards, Maloy, and Verock-O'Loughlin's also researched how literacy coaches often focus on literary texts with less attention being given to reading of math.

Innabi (2005) discussed reading comprehension as an issue related to mathematics performance leading to two meanings of reading. The first is the ability to read to understand any given text. The second meaning is specifically related to reading and understanding mathematical texts. Elliott (1997) concluded reading math is different from reading other texts. He suggested some factors to help mathematical reading strategies as: terminology or technical terms, eye patterns or reading from inside and moving outward, graph and text interactions, and reading direction or reading from bottom to top. He promoted that language arts teachers as well as math teachers provide strategies for incorporating these factors into all content areas.

Ganske and Fisher (2010) asserted the problem is that students often do not know what words mean in a math context. They maintain students have to engage with words multiple times to get a sense of meaning and usage. Word walls, vocabulary cards, word sorts, and word games are suggested strategies for providing multiple usage times. Fisher and Frey (2008) maintained because each word is essential, students must be able to read the directions with 100% accuracy and must know the meaning of all the words. For example, the word prime means excellent quality in *prime beef*, whereas, it means a number with only two multiples in *prime number*. This could be a stumbling block in the math question: Name a prime number.

Fuentes (1998) argued it is important for teachers of mathematics to realize that young children develop reading and mathematics skills at different rates. He maintained some children develop algorithm skills or the ability to compute well, until they are faced with word problems. These children work well when information is presented as numbers with operations signs. However, when asked to decide whether

to calculate sums or products, they must comprehend the language of the text before they can use an appropriate algorithm. Such children need to be able to read mathematically. To improve mathematics, we must improve children's reading ability (Fuentes, 1998).

Aunola and Nurmi (2008) investigated the relationship between mathematical word problem skills and reading comprehension. Their research provided that performance on word problems was strongly related to performance in reading comprehension. They reported fluent reading ability increased problem solving performance. However, according to Adams (2003) many math teachers limit reading activities in math classes to activities such as: reading biographies of mathematicians, reading the history of mathematical concepts, and reading word problems. She suggested teachers should give more attention to math as a language where the reader is challenged to acquire comprehension and mathematical understanding with fluency and proficiency through the reading of numerals and symbols in addition to math words.

Geary and Hoard (2001) asserted that a student with language problems in math may:

- have difficulty with the vocabulary of math
- be confused by language in word problems
- not know when irrelevant information is included or when information is given out of sequence
- have trouble learning or recalling abstract terms
- have difficulty understanding directions

- have difficulty explaining and communicating about math, including asking, and answering questions
- have difficulty reading texts to direct their own learning
- have difficulty remembering assigned values or definitions in specific problems (pg. 638).

To help these students Mayer (1987) developed a framework for analysis of mathematical problem solving by identifying the four components involved: translating, integrating, solution planning, and execution, with the first two components being heavily dependent on reading. Artz and Armour-Thomas (1992) provided another protocol for problem solving in which reading was one of the six categories; read, analyze, explore, plan, implement, and verify.

According to Innabi (2005), the educational standards movement in mathematics contains standards related to both content and process. The process standards are: problem solving, communication, connections, mathematical thinking, and representation. The National Council of Teachers of Mathematics (2000) emphasized the important role the communication standard plays in helping students construct mathematical knowledge and form links between informal notions and abstract symbolism of mathematical ideas. This interaction of written and oral language provides students with opportunities to build reading and mathematical abilities in concrete ways.

Gender Differences in Reading Proficiency

Females have been posting higher reading scores than males for decades. Females have higher high school grade point averages, are more widely represented as school valedictorians, and attend and graduate from college more often than males (Sadowski, 2010). Research by Sadowski concluded males in the fourth and eighth grades reached reading achievement levels of basic, proficient, and advanced at lower rates than females. This was consistent in all 50 states and the District of Columbia. Whitmire (2010) argued literacy deficits in males put them at a disadvantage across the curriculum. He reported many state math assessments as well as college admissions tests contain only word problems.

Sadowski's (2010) research showed the gender gaps in reading hold true across differences in race, ethnicity, and family income. However, the size of the gap may differ dramatically by geographical area. Wealthier areas have a smaller gap in scores between males and females than middle class or lower income families. Sadowski attributed this to affluent males growing up with dads who are readers.

Pickle (1998) reported that as early as 1910, up to 85% of children struggling with reading were males. This research identified neurobiological, genetic, environmental, and motivational factors as potential explanations for more males being poor readers. However, Prior (2009) reported no significant or very small differences in the number of poor readers who are males compared to the number of females. Hawke, Olson, Willcut, Wadsworth, and Defries (2009) claimed males have a greater variability in reading scores than females, resulting in more males scoring in the tail of the distribution. Machin and Pekkarinen (2008) also reported males have a greater

variance in scores, resulting in a greater number of males in the bottom 5%. They also found a greater variance in males' scores in mathematics leading to more males in the top 5% in math scores.

Below, Skinner, Fearrington, and Sorrell (2010) researched gender differences in reading skills for kindergarten through fifth grade students. They found no significant differences across males and females scores in first grade on three of the four measures. A significant female advantage in oral reading fluency did not emerge until the fourth grade.

Bank, Biddle, and Good (1980) theorized teacher behavior toward students is influenced by the behavior of a particular student as well as teachers' assumptions of what the student will do. This theory suggested teachers may hold higher expectations for females. Leinhardt, Seewald, and Engel (1979) found teachers made more academic contact with females during reading instruction. The contact with males was often behavioral in nature.

Brozo (2002) contributed reading deficits in males to interest and motivational factors. Males prefer reading nonfiction or informational material (Dreikurs, 1983), whereas fictional reading is most typically used in elementary reading instruction (Brozo, 2002). Clary (2001) noted this lack of motivation for reading could explain why males are less likely to read for pleasure. This may explain the differences in achievement scores between males and females because reading achievement has been found to be a function of the amount of time and energy students invest in reading both for pleasure and for school (Cipielewski & Stanovich, 1992).

Historically research has provided that males score lower on reading achievement tests than females. Several factors contribute to this statistic including males generally develop the skills associated with reading and writing 12 to 24 months later than females (Sadowski, 2010). However, schools should think locally and investigate their selves first because there are numerous discrepancies in the research on gender differences in achievement scores (Whitmore, 2010).

Technology Assisted Instruction

High school students across the country are receiving digital information personalized to them through web searches for specific information. These students are using new technologies to instruct themselves (Hasselbring & Bausch, 2005). The same advantage can be given to elementary students with a little planning. Ash and Davis (2010) suggested high school students were frustrated because they had to power down when they entered school buildings. Most students e-mail, instant message, text, and use social networking daily. IPods, smartphones, cell phones, and laptops are a few of the learning devices students have at home (Ash & Davis, 2010). According to Staff (2010) 95% of high school students expect to use technology in their college classes. These students want to use these technologies while in high school so they will be prepared for college expectations.

In an attempt to help struggling students school systems are turning to technology assisted programs. Mason and Blanchard (1979) defined computer assisted instruction as any instruction in which the material to be learned is presented by equipment under digital computer control and in which the students' responses are

given to a computer for processing. O'Neil and Perez (2003) reported some benefits of technology based instruction as the ability to tailor sequence, pace, difficulty, content, and style of presentation to each student's' unique needs. This ensures some progress is made by everyone. They found this method of instruction reduced the time it takes students to reach a variety of objectives by 30%. They also stated the most important aspect of adding technology to instruction is the capability to provide personally tailored, highly interactive environments. One study suggested the average number of questions asked to each student in a computer program was multiple times more than the average three asked to an individual student in a classroom setting (O'Neil & Perez, 2003). Using computer assisted instruction in classrooms has many appealing advantages over strictly teacher centered presentation. Immediate reinforcement of student responses, culture free environments, infinite patience, and sensory immersion are all capabilities of technology based lessons having been verified in O'Neil and Perez's research.

Carbonara (2005) stressed the importance of learning effectiveness when evaluating new technologies. The goal of information technology should be to enhance teaching and learning and to increase the efficiency and overall effectiveness of the educational program. According to Carbonara school systems need to do extensive research before purchasing programs. Butzin (2001) pointed out billions of dollars have been spent on putting technology in public schools while American students still rank near the bottom internationally. He found teachers were not receiving adequate instruction in the usage of the programs and that many seasoned teachers find computers intimidating and do not use them in their classrooms.

According to Newman (1990) the kinds of complex meaningful projects within which authentic technology use occurs require skills and knowledge from different disciplines. They require extended periods of time and are conducive to group work. These projects change the teacher's role to coach as opposed to instructor. Technology projects add pressure to break down traditional schedules of short blocks of instructional time. Means and Olsen (1994) found authentic uses of technology had advantages over more didactic uses because they are flexible. They asserted using technology as a tool or a means of communication can be supported in any curriculum, whereas tutorial or exploratory technology was often not only used for enrichment or not at all (Means & Olsen, 1994).

Butzin (2001) analyzed 500 computer based instruction studies. He concluded students usually learn more in less time when receiving computer based instruction. Programs such as *Writing to Read, Apple Classroom's of Tomorrow*, and *Higher Order Thinking Skills* all have positive achievement. During his research Butzin found the limited number of computers and lack of teacher training to be a barrier to computer enhanced learning. He discovered becoming knowledgeable and keeping current with instructional software is a daunting task for elementary teachers who have a limited amount of time to present information.

Computer assisted instruction tools such as audio books and optical character recognition are helping students with learning disabilities where teachers have trouble communicating with students (Stansberry, 2010). According to the National Center for Educational Statistics (2009), approximately 44% of students with learning disabilities spend 80% or more of their day in inclusive classrooms. Lerner's (2003) research

suggested as many as 8 out of 10 students with learning disabilities have reading problems so inhibiting they cannot read or understand grade level material. This research examined how assistive technologies break down barriers to literacy in two ways: as reading support and as reading intervention. Reading support means computer based applications helped students access grade level text as they read. Reading intervention was technology that helped students strengthen and improve overall reading skills (Lerner, 2003).

The employment world of the 21st century is technology based. However, teachers cannot rely solely on technology or even solely on information literacy skills (Carbonara, 2005). Productive citizens use both to provide a complete inventory of skills and knowledge. Therefore, schools need to be providing learning opportunities from both areas.

Technology in Reading Instruction

Computer based reading instruction for remedial readers appears to have caught on more than in traditional instruction. Smith (1977) pointed out not all children learn skills at the same rate. Adding to this problem is the fact text books are often written one to three reading levels above the age for which they are intended (Ash & Davis, 2010). These two factors often cause a discrepancy of reading abilities in one classroom. Students who begin to fall behind find it difficult to catch up in a classroom where the instruction is happening faster than they can keep up and the textbook is above their background knowledge.

According to Mason and Blanchard (1979) computers have long been used to diagnose reading problems and suggest remedial materials. Several teachers have used a computer to generate a word list, record dictation, and model the reading process. Computer based reading intervention programs provide instruction at students' individual reading levels and uses authentic materials interesting to the reader. Such programs have the capabilities to personalize instruction, making it more interesting and ability appropriate. Beetham and Sharpe (2001) discovered when students were able to receive help from the computer; they scored higher on comprehension questions than students who read from a printed book. In their research students replied they were more likely to get help from the computer than to ask a teacher. By helping students decode words electronic books are more interactive, therefore, providing a greater exchange of information than traditional reading class (Beetham & Sharpe).

Struggling students benefit from technology's ability to read text aloud, organize their thoughts, and repeat directions. Foorman, Fletcher, and Francis (1997) asserted students enjoy the independence gained from instruction applications. The claim is support is ready when needed, while targeted individual problems can be addressed.

According to Palmer (2003) computerized reading training programs such as *Read, Write, & Type!* and *Read Naturally* proved effective at helping students face reading challenges. A study of Scholastic's READ 180 program yielded significant gains in fluency and comprehension in the Des Moines Independent Community School District with 80% of student in the study no longer needing services for reading after 1 year of instruction.

Butzin's (2001) meta-analysis research of several studies reported instructional technology having an overall positive effect on learning. Remedial readers need all the positive effects they can get to motivate them to keep trying. Erickson (2008) concluded that if the educational goal is to become life-long readers, students must be taught active learning strategies with interesting, authentic materials. These can be aided through computer assisted instructional programs

Reading Intervention

Smith (1997) pointed out children should not be labeled as failures in reading because not everyone learns at the same rate. He found many textbooks are written one to three reading levels above the age they are intended for. This causes some students to fall further and further behind. Erickson (2008) promoted students should be instructed at their individual reading levels. Therefore, intervention from the regular program was sometimes necessary. According to Calhoon (2010) time was a critical factor. The older children get, the less instructional time during the day they have to learn reading, and the less time they have left in school. Dunn (2010) contended an early reading intervention program identifies through assessment students at risk of reading failure. These students should receive intensive instruction designed to accelerate growth in reading. According to McPartland (1992) instruction should include strategies of decoding, rereading, and seeking assistance. Teaching strategies such as predicting, thinking aloud, and using picture clues help readers be able to manage text. Retelling, visualizing, previewing questions, generating questions, and paraphrasing are also strategies needed by readers (Klingner, Urbach, Golos, Brownwell, & Menon,

2010). This group emphasized teachers need guidance in how to combine these approaches in the classroom. They suggested there are gaps between research and what teachers are doing in practice. Barnyak and Paquette (1995) concluded a daily intervention program is an effective intervention for children who exhibit reading delays. Children receiving this type of intervention gained significantly more progress than their peers without intervention. Reading Recovery, READ 180, and RTI are popular intervention programs.

Reading Recovery

According to the Reading Recovery Council of North America (2010) the goal of Reading Recovery was to reduce the number of first grade students who have extreme difficulty learning to read and write. The program involves a year-long professional development, where teachers learn to explore research-based procedures. There is intensive one-on-one instruction daily. A long-range plan is developed and their research and evaluation is used to monitor results. The What Works Clearinghouse (READ 180, 2009) gave Reading Recovery the highest possible rating on students' alphabetic skills and general reading achievement. They gave the next highest rating on fluency and comprehension outcomes. The National Data Evaluation Center (Reading Recovery in the United States, 2007-2008) reported Reading Recovery students had results indicating a lasting program effect at least by the end of the second grade on broad skills. However, Carlson (n.d.) reported Reading Recovery failed to significantly improve literacy development of children.

READ 180

Scholastic's READ 180 is a reading intervention program for students in grades 4-12, that includes technology, print, and professional development. Intensive professional development for teachers provides a planned instructional path. According to Hasselbring and Goin (2004) one of the greatest problems poor readers face is a deficit in background knowledge in many subject areas. Poor readers do not have the background needed to comprehend the text even though they can read the words. The READ 180 program remedies this problem by giving the reader a short anchor video, providing background knowledge needed to make sense of the text. These videos have three themes: people and culture, science and math, and history and geography. Students use this new knowledge when given a text on their own pretested reading level.

History. Davidson and Miller (2002) studied how technology could be used to help struggling readers. They investigated how educational technologies were helpful to students with learning disabilities and those who were lacking basic skills mastery. They identified four deficits exhibited by struggling readers. The deficits identified by Davidson and Miller were:

1. A lack of decoding skills and reading fluency
2. Poor comprehension due to the inability to form mental models and lack of vocabulary
3. Inability to process and understand grade-level content area text with a concentration of academic language

4. Low motivation and lack of connection to materials and school.

Program Logistics. READ 180 classes are 90 minutes in length. There is a 20-minute whole group instruction followed by three 20-minute small groups: teacher directed skills instruction, computer aided READ 180 software, and modeled-independent reading. The class is wrapped up with a 10-minute whole group meeting. The teacher directed skills instruction time is dedicated to basic skills practice in reading, language arts, and writing. The small group make up is flexible and can be created from program reports on which students are lacking in specific skills. The small group time provides direct instruction and guided practice. While at this group teachers can provide immediate feedback as well as discussion, as they observe seven students at a time while they work (READ 180, 2010).

The modeled and independent reading group allows students to build reading comprehension skills through modeled and independent reading. Instructional quality books present students with age appropriate, relevant texts. Students read books on their appropriate Lexile level, allowing for successful independent reading. Students also listen to audio books to strengthen reading fluency and habits with grade level material (READ 180, 2010).

During the individual computer based instruction time students begin with a video and a passage summarizing the video. The passages contain many examples of high-frequency words and grade appropriate content area vocabulary. Students are assigned to their appropriate reading level through diagnostic assessment (Davidson & Miller, 2002). Therefore, they are practicing at their own level, avoiding frustration.

Students are able to reread a passage as often as necessary as well as ask the computer for help with words. The National Reading Panel (2001) proclaimed the opportunity to read and reread produced a high degree of success building fluency.

After the video and summary passage, students participate in vocabulary and fluency building activities repeatedly working on the words from the passage. The text-reader software enables the student to decode, pronounce, spell, and define words as well as break them into parts and translate them into one of five different languages. These activities are designed to allow better comprehension through rapid word recognition, orthographic knowledge, and phonological processing skills. Adams (1998) found this modeling of oral blending and sequencing important to developing phonic awareness. Audio and visual support highlights sound-letter correspondences. Phonic elements and significant word parts are modeled during these passages (Davidson & Miller, 2002). The software also allows teachers to listen to passages read by the student and provide immediate corrective feedback on student errors. Following the vocabulary work, the computer presents the student with comprehension questions about the passage. Finally, a recap yielded how many words he or she has read correctly. This process is repeated until the student can do it with speed and accuracy. Next, a new video segment is introduced (Scholastic, 2010) .

According to Scholastic (2010) students in Seminole County Florida averaged at least 1 year of reading growth in 1 year of READ 180. The What Works Clearinghouse (READ 180, 2010) reported that READ 180 was found to have potentially positive effects on comprehension and general literacy achievement. However, data on READ 180 from Scholastic should be interpreted with caution.

Response to Intervention

The Response to Intervention (RTI) is a new method for providing reading instruction and accurately placing eligible children in special education programs. According to Mokhtari, Porter, and Edwards (2010) RTI's core goal is to identify struggling readers early. Through early intervention of well-timed, intensive instruction students will be able to catch up with their peers. RTI is a tiered framework for instructional delivery matched to students' needs. Cassidy and Cassidy (2008) stated RTI was rated by a select group of prominent reading professionals as one of the top five *very hot topics* in a survey of what's hot in literacy. Proponents have claimed it to offer great promise for creating more powerful, multitiered, and responsive reading instruction. Mokhtari et al.(2010) exhibited concern with the little evidence of reading teachers having sufficient knowledge of RTI. They questioned if they were adequately prepared and if they had the expertise and resources needed.

Summary

This chapter has presented a review of literature focused on research findings and writings relevant to the history of reading instruction, classroom organization and structure, technology assisted instruction in reading, the relationship between reading and math, gender differences in reading proficiency, and reading intervention programs. The focus of the review of reading interventions programs was on the Scholastic READ 180 program.

CHAPTER 3

RESEARCH METHODOLOGY

The purpose of this study was to compare the academic achievement in reading-language arts and math of students who participated in READ 180 under a self-contained organization, with students who participated in READ 180 with a departmentalized organization, and with students who did not participate in the READ 180 program. This chapter focused on research design, population, instrumentation, procedures, data analysis, and a summary.

Research Design

This research was a quantitative, comparative study of data exploring relationships. The study was conducted to determine if there were significant differences in academic achievement of READ 180 students in self-contained classrooms compared to READ 180 students in departmentalized classroom and non-Read180 students. Test scores were compared in this ex post facto research. Discovery Education (DE) and Scholastic Reading Inventory (SRI) scores were collected from students' records both before and after the implementation of the reading intervention program. Tennessee Comprehensive Assessment Program (TCAP) scores were collected after the program.

Population

The population for this study included 42 READ 180 fourth and fifth grade students from self-contained classrooms, 140 READ 180 fourth and fifth grade students

from departmentalized classrooms, and 100 fourth and fifth grader students who were not enrolled in the READ 180 program. All of the participating students attended rural schools from a Southeast Tennessee school system. The study included scores from both males and females.

Data Collection Procedures

Approval for this study was requested from the Institutional review Board (IRB) (Appendix B) at East Tennessee State University as well as the Director of participating school system (Appendix A). After approval was granted, scores from the DE, SRI, and TCAP tests were collected. Students were selected based on their participation in the READ 180 program. The non-READ 180 students were randomly selected using a random numbers table. Data were supplied by the principal at each READ 180 school; therefore, all scores remained anonymous.

Academic achievement in reading-language arts and math were compared using TCAP scores as reported for the end of the 2009-2010 school year (CTB McGraw-Hill). Student improvement scores (posttest minus pretest) on the SRI as reported in August 2009 and in May 2010 were compared to assess students' reading level. Improvement scores (posttest minus pretest) from DE tests in reading-language arts and math as reported in September 2009 and May 2010 were compared.

The TCAP exam is a timed multiple choice assessment measuring performance in reading-language arts, math, science, and social studies. The TCAP tests are state mandated exams administered to students in grades 3-8 each spring. The tests were given over 4 days with all administrators following the same strict rules of conduct. The

TCAP test provided criterion-referenced information that is measured against specific standards. Each item on the test was linked to a performance indicator that corresponds with objectives from the state of Tennessee's curriculum standards. Answers are machine scored and listed as a scale score as well as overall proficiency in each content area.

The SRI test uses the Lexile framework to match readers to appropriate texts. The SRI was given three times during the school year within the READ 180 classroom. READ 180 students use a technology enhanced curriculum. The SRI test was given in the same setting the students are accustomed to for daily instruction. SRI tests were given at the beginning, middle, and end of the school year. However, only the beginning and the end of the year tests were used to determine improvement scores.

Discovery Education tests were administered by classroom teachers in September and May. The numbers of items answered correctly were compared in reading-language arts and math. Statistics describing the TCAP test (TB/McGraw-Hill, 1996), the SRI test, (Scholastic READ 180, 2010, program overview page) and the DE tests (Discovery Education Assessment, 2011) have determined them to be reliable and valid. Testing took place in the fall and the spring of the 2009-2010 school year.

Research Questions and Hypothesis

The following research questions and null hypotheses were used to guide the study:

1. Are there significant differences in the 2009-2010 students' improvement scores (posttest minus pretest) in reading-language arts as measured by the Discovery

Education Assessment (DE) with regard to classroom organization? (READ 180 self-contained, READ 180 departmentalized, Non-READ 180)

$H_0$1 There is no significant difference between DE improvement scores of students in READ 180 self-contained, READ 180 departmentalized, and Non-READ 180 on reading-language arts test in the 2009-2010 school year.

2. Are there significant differences in the 2009-2010 students' improvement scores (posttest minus pretest) in reading-language arts as measured by Student Reading Inventory (SRI) with regard to classroom organization? (READ 180 self-contained, READ 180 departmentalized)

   $H_0$2 There is no significant difference between SRI improvement scores of students in READ 180 self-contained and READ 180 departmentalized on SRI test in the 2009-2010 school year.

3. Are there significant differences in the 2009-2010 students' scores in reading-language arts as measured by the Tennessee Comprehensive Assessment Program (TCAP) with regard to classroom organization? (READ 180 self-contained, READ 180 departmentalized, Non-READ 180)

   $H_0$3 There is no significant difference between TCAP scores of students in READ 180 self-contained, READ 180 departmentalized, and Non-READ 180 on reading-language arts test in the 2009-2010 school year.

4. Are there significant differences in the 2009-2010 students' improvement scores (posttest minus pretest) in math as measured by DE with regard to classroom organization? (READ 180 self-contained, READ 180 departmentalized, Non-READ 180)

$H_0$4 There is no significant difference between DE improvement scores of students in READ 180 self-contained, READ 180 departmentalized, and Non READ 180 on the math test in the 2009-2010 school year.

5. Are there significant differences in the 2009-2010 students' scores in math as measured by TCAP with regard to classroom organization? (READ 180 self-contained, READ 180 departmentalized, Non-READ 180)

   $H_0$5 There is no significant difference between TCAP scores of students in READ 180 self-contained, READ 180 departmentalized, and Non-READ 180 on the math test in the 2009-2010 school year.

6. Are there significant differences regarding only READ 180 students' 2009-2010 improvement scores (posttest minus pretest) in reading-language arts as measured by the DE with regard to classroom organization and between male and female students?

   $H_0 6_1$ There is no significant difference between DE improvement scores in reading-language arts in students in READ 180 departmental and READ 180 self-contained classes.

   $H_0 6_2$ There is no significant difference in DE improvement scores in reading-language arts between males and female students.

   $H_0 6_3$ The DE Reading-Language Arts test scores for READ 180 students do not significantly vary by classroom organization as a function of gender.

7. Are there significant differences regarding only READ 180 students' 2009-2010 improvement scores (posttest minus pretest) in reading-language arts as

measured by the SRI with regard to classroom organization and between male and female students?

H_07_1 There is no significant difference between SRI improvement scores in reading-language arts in students in READ 180 departmental and READ 180 self-contained classes.

H_07_2 There is no significant difference in SRI improvement scores in reading-language arts between males and female students.

H_07_3 The SRI Reading-Language Arts test scores for READ 180 students do not significantly vary by classroom organization as a function of gender.

8. Are there significant differences with regard to only READ 180 students' 2009-2010 scores (posttest minus pretest) in reading-language arts as measured by the TCAP with regard to classroom organization and between male and female students?

   H_08_1 There is no significant difference between TCAP improvement scores in reading-language arts in students in READ 180 departmental and READ 180 self-contained classes.

   H_08_2 There is no significant difference in TCAP improvement scores in reading-language arts between males and female students.

   H_08_3 The TCAP Reading-Language Arts test scores for READ 180 students do not significantly vary by classroom organization as a function of gender.

Data Analysis of Research Questions

An one-way analysis of variance (ANOVA) was used to address research questions 1 through 5 that seek to determine if there are significant differences in reading-language-arts and math TCAP scores, reading-language arts and math DE scores, and SRI scores with regard to classroom organization. The independent variables were the type of classroom organizations. The dependent variables were the TCAP score, SRI score, and DE score. Two-way analyses of variances (2 x 2 ANOVAs) were used to address research questions 6 through 8 that seek to determine if there are significant differences in reading-language arts TCAP scores, SRI scores, and DE scores with regard to classroom organization and gender. The dependent variables were the TCAP scores and the SRI and DE difference scores. The independent variables were gender and classroom organization.

The Statistical Program for the Social Sciences was used to analyze the data and all data were analyzed at the .05 level of significance.

Summary

The methodology and procedures used in this study were presented in Chapter 3. The research design and population were described. Data from the state report of TCAP tests, class reports of the SRI test and DE were evaluated for comparison.

CHAPTER 4

ANALYSIS OF DATA

This chapter contains the results of the data analysis as it relates to the eight research questions proposed in Chapters 1 and 3. The purpose of this study was to compare the achievement of fourth and fifth grade students in reading-language arts and math who participated in the Scholastic READ 180 program from self-contained classroom organizations with the achievement of READ 180 students from departmentalized classrooms and with fourth and fifth grade students not enrolled in READ 180. The population demographics are reported in Figure 1. The data were gathered from standardized test scores in reading-language arts and math for fourth and fifth grade students in seven Southeastern Tennessee schools. The Tennessee Comprehensive Assessment Program, Discovery Education Assessment, and the Scholastic Reading Inventory scores were collected for the 2009-2010 school year. Chapter 4 was guided by eight research questions and associated null hypotheses.

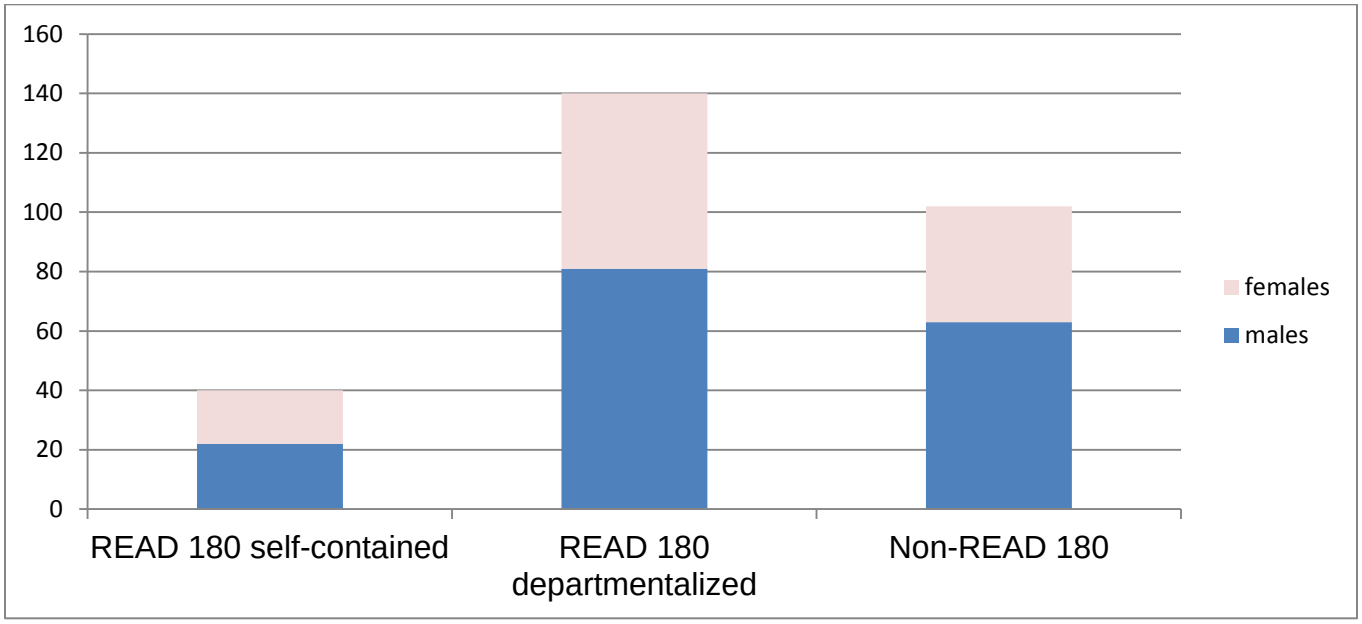

Figure 1: Demographics of Population with Regard to Classroom Organization

Analysis of Research Questions

Research Question 1

Are there significant differences in the 2009-2010 students' improvement scores (posttest minus pretest) in reading-language arts as measured by the Discovery Education Assessment (DE) with regard to classroom organization? (READ 180 self-contained, READ 180 departmentalized, Non-READ 180)

The null hypothesis associated with this question was:

$H_0$1: There is no difference between DE improvement scores of students in READ 180 self-contained, READ 180 departmentalized, and Non-READ 180 in reading-language arts test in the 2009-2010 school year.

To answer this question a one-way analysis of variance was conducted to evaluate the relationship between the difference in student improvement scores in reading-language arts on the DE test and the classroom organization (READ 180 self-contained, READ 180 departmentalized, Non-READ 180). The independent variable was the type of classroom organization and the dependent variable was the DE improvement score (posttest minus pretest). The ANOVA was significant, $F(2, 277) = 4.83$, $p = .010$. Therefore, $H_0$1 was rejected. The strength of the relationship between classroom organization and DE reading-language arts improvement scores as assessed by η^2 was (.03) was small.

Because the overall *F* test was significant, post hoc multiple comparisons were conducted to evaluate pairwise differences among the means of the three groups. A Tukey procedure was selected for the multiple comparisons because equal variances were assumed. There was a significant difference between the means of the READ

180 self-contained classes and the Non-READ 180 classes (p = .001) and between the READ 180 self-contained classes and the READ 180 departmental classes (p = .007). However, there was not a significant difference between the Non READ 180 classes and the READ 180 departmental classes (p = .680). The 95% confidence intervals for the pairwise differences as well as the means and standard deviations for the three classroom organizations are reported in Table 1. The distributions of DE scores by classroom organization are represented in Figure 2.

Table 1

Means and Standard Deviations with Confidence Intervals of Pairwise Differences for DE Reading-language Arts Improvement Scores

Classroom organization	*M*	*SD*	*Non-READ 180*	*READ 180 Departmental*
Non-READ 180	1.92	5.27		
READ 180 departmental	-1.28	5.25	1.05 to 1.03	
READ 180 self-contained	1.61	6.15	1.68 to 1.05	1.68 to 1.03

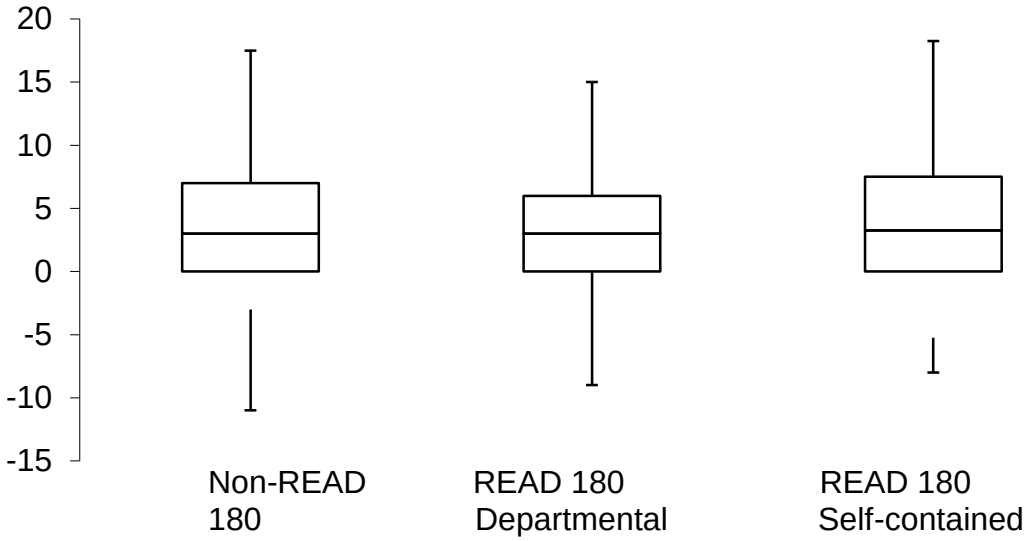

Figure 2. Distribution of DE Reading-language arts Scores for READ 180 and Non-READ 180 Classrooms

Research Question 2

Are there significant differences in the 2009-2010 students' improvement scores (posttest minus pretest) in reading-language arts as measured by Student Reading Inventory (SRI) with regard to classroom organization? (READ 180 self-contained, READ 180 departmentalized)

The null hypothesis associated with this question was:

$H_0$2: There is no difference between SRI improvement scores of students in READ 180 self-contained and READ 180 departmental classes on the SRI test during 2009-2010 school year.

To answer this question a one-way analysis of variance was conducted to evaluate the relationship between the difference in student improvement scores in reading-language arts on the SRI test and the students' classroom organization (READ 180 self-contained, READ 180 departmentalized).

The independent variable was the type of classroom organization and the dependent variable was the SRI improvement score (posttest minus pretest). The ANOVA was not significant, $F(1, 178) = 1.98$, $p = .160$. Therefore, $H_0 2$ was retained. The strength of the relationship between classroom organization and SRI reading-language arts improvement scores as assessed by η^2 was (.01) was small. The results indicate that classroom organization does not significantly affect SRI reading-language arts improvement scores. The means and standard deviations for the classroom organizations are reported in Table 2. Figure 3 reports the distribution of SRI scores by classroom organization.

Table 2

Means and Standard Deviations for SRI Reading-Language Arts Improvement Scores

Classroom organization	*N*	*M*	*SD*
READ 180 departmental	140	171.39	131.62
READ 180 self-contained	40	205.57	147.83

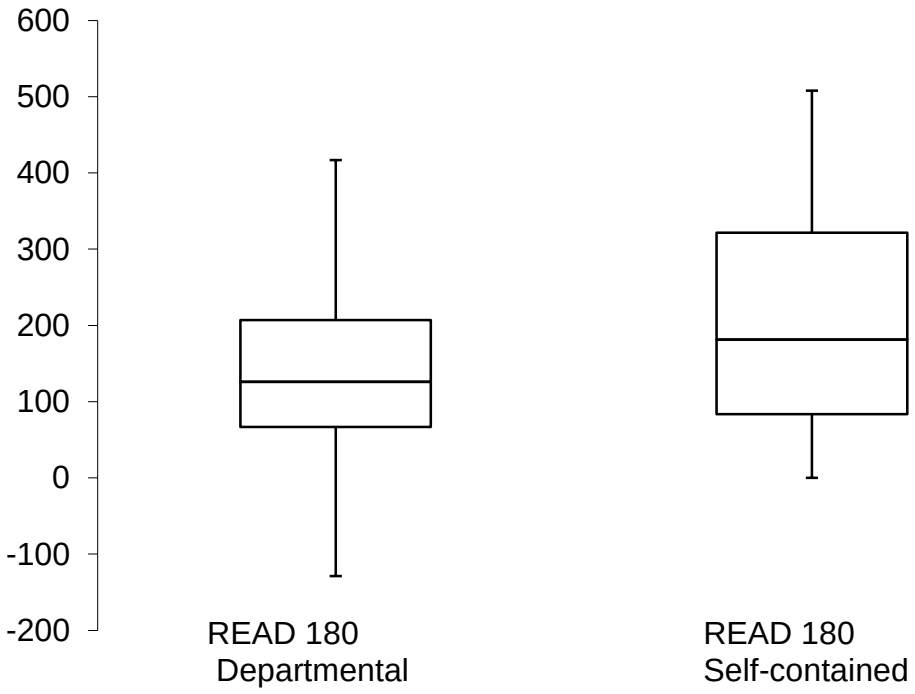

Figure 3. Distribution of SRI Reading-language arts Improvement Scores for READ 180 Classrooms

Research Question 3

Are there significant differences in the 2009-2010 students' scores in reading-language arts as measured by the Tennessee Comprehensive Assessment Program (TCAP) with regard to classroom organization? (READ 180 self-contained, READ 180 departmentalized, Non-READ 180)

The null hypothesis associated with this question was:

$H_0$3: There is no significant difference between TCAP scores of students in READ 180 self-contained, READ 180 departmentalized, and Non-READ 180 on reading-language arts test in the 2009-2010 school year.

To answer this question a one-way analysis of variance was conducted to evaluate the relationship between the student scores in reading-language arts on the

TCAP test and the students' classroom organization (READ 180 self-contained, READ 180 departmentalized, Non-READ 180). The independent variable was the type of classroom organization and the dependent variable was the TCAP score. The ANOVA was significant, $F(2, 277) = 35.17$, $p = .001$. Therefore, $H_0 3$ was rejected. The strength of the relationship between classroom organization and TCAP reading-language arts improvement scores as assessed by η^2 was (.20) was large.

Because the overall *F* test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the three groups. A Tukey procedure was selected for the multiple comparisons because equal variances were assumed. There was a significant difference between the means of the READ 180 self-contained classes and the Non-READ 180 classes ($p < .001$) and between the Non-READ 180 classes and the READ 180 departmental classes ($p < .001$). However, there was not a significant difference between the READ 180 self-contained classes and the READ 180 departmental classes ($p = .926$). The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the three classroom organizations are reported in Table 3. The distributions of TCAP scores by classroom organizations are reported in Figure 4.

Table 3

Means and Standard Deviations with Confidence Intervals of Pairwise Differences for TCAP Reading-language Arts Scores

Classroom organization	*M*	*SD*	*Non-READ 180*	*READ 180 Departmental*
Non-READ 180	747.64	25.31		
READ 180 departmental	715.41	37.07	4.49 to 7.36	
READ 180 Self-contained	715.85	26.88	8.10 to 7.35	8.96 to 4.49

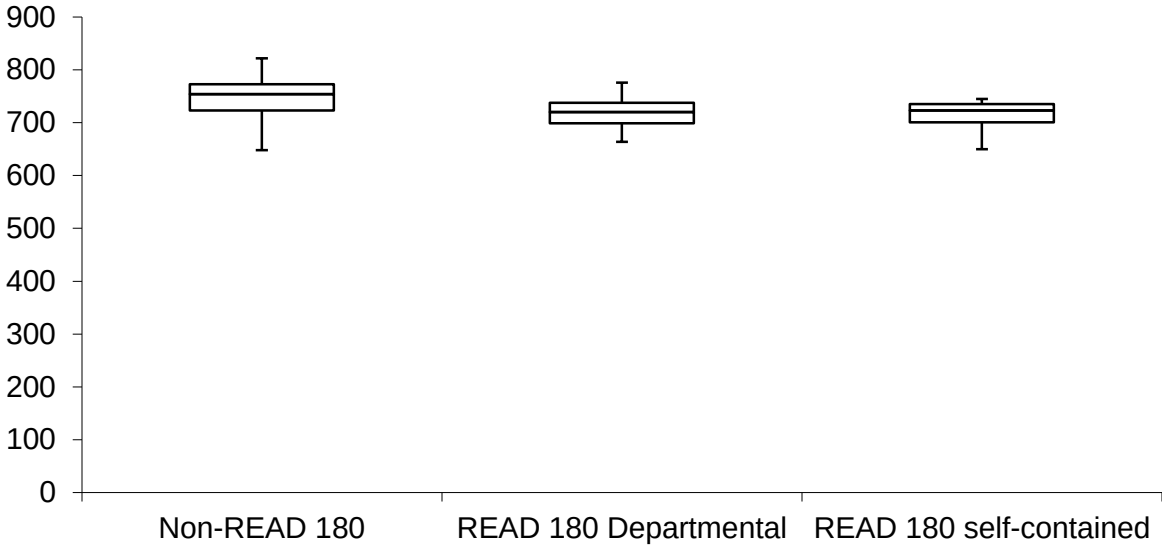

Figure 4. Distribution of TCAP Reading-language arts Scores for READ 180 and Non-READ 180 Classrooms

Research Question 4

Are there significant differences in the 2009-2010 students' improvement scores (posttest minus pretest) in math as measured by DE with regard to classroom organization? (READ 180 self-contained, READ 180 departmentalized, Non-READ 180)

The null hypothesis associated with this question was:

$H_0$4: There is no significant difference between DE improvement scores of students in READ 180 self-contained, READ 180 departmentalized, and Non-READ 180 on the math test in the 2009-2010 school year.

To answer this question a one-way analysis of variance was conducted to evaluate the relationship between the student scores in math improvement scores on the DE test and the students' classroom organization (READ 180 self-contained, READ 180 departmentalized, Non-READ 180). The independent variable was the type of classroom organization and the dependent variable was the DE math improvement score. The ANOVA was significant, $F(2, 277) = 3.51$, $p = .030$. Therefore, $H_0$4 was rejected. The strength of the relationship between classroom organization and DE math improvement scores as assessed by η^2 was (.02) was small.

Because the overall *F* test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the three groups. A Tukey procedure was selected for the multiple comparisons because equal variances were assumed. There was a significant difference between the means of the READ 180 self-contained classes and the Non-READ 180 classes ($p = .201$) and between the Non-READ 180 classes and the READ 180 departmental classes ($p = .010$). However, there was not a significant difference between the READ 180 self-contained classes and the READ 180 departmental classes ($p = .526$). The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the three classroom organizations are reported in Table 4. The distributions of scores by classroom organization are represented in Figure 5.

Table 4

Means and Standard Deviations with Confidence Intervals of Pairwise Differences for DE Math Improvement Scores

Classroom organization	*M*	*SD*	*Non-READ 180*	*READ 180 Departmental*
Non-READ 180	2.87	4.82		
READ 180 Departmental	1.25	4.30	0.95 to 0.80	
READ 180 self-contained	1.78	3.87	1.24 to 0.95	1.24 to 0.80

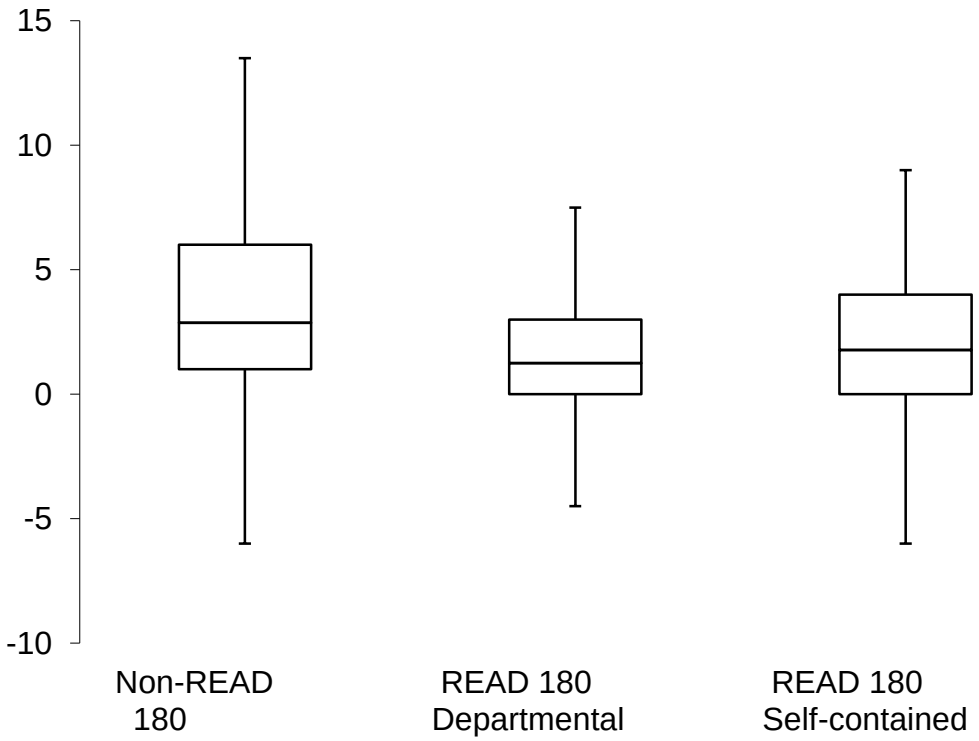

Figure 5. Distribution of DE Math Improvement Scores for READ 180 and Non-READ 180 Classrooms

Research Question 5

Are there differences in the 2009-2010 students' scores in math as measured by TCAP with regard to classroom organization? (READ 180 self-contained, READ 180 departmentalized, Non-READ 180)

The null hypothesis associated with this question was:

$H_0$5: There is no significant difference between TCAP scores of students in READ 180 self-contained, READ 180 departmentalized, and Non-READ 180 on the math test in the 2009-2010 school year.

To answer this question a one-way analysis of variance was conducted to evaluate the relationship between the difference in student scores on the math TCAP test and the students' classroom organization (READ 180 self-contained, READ 180 departmentalized, Non-READ 180). The independent variable was the type of classroom organization and the dependent variable was the math TCAP scores. The ANOVA was significant, $F(2, 277) = 29.07$, $p < .001$. Therefore, $H_0$5 was rejected. The strength of the relationship between classroom organization and math TCAP scores as assessed by η^2 was (.17) was large.

Because the overall *F* test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the three groups. A Tukey procedure was selected for the multiple comparisons because equal variances were assumed. There was a significant difference between the means of the READ 180 self-contained classes and the Non-READ 180 classes ($p < .001$) and between the Non-READ 180 classes and the READ 180 departmental classes ($p < .001$). However, there was not a significant difference between the READ 180 self-contained classes

and the READ 180 departmental classes (p = .225). The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the three classroom organizations are reported in Table 5. The distributions of scores by classroom organization are represented in Figure 6.

Table 5

Means and Standard Deviations for TCAP Math Improvement Scores

Classroom organization	*n*	*M*	*SD*
READ 180 self-contained	40	726.20	21.29
READ 180 departmental	140	718.29	34.52
Non-READ 180	100	751.88	37.09

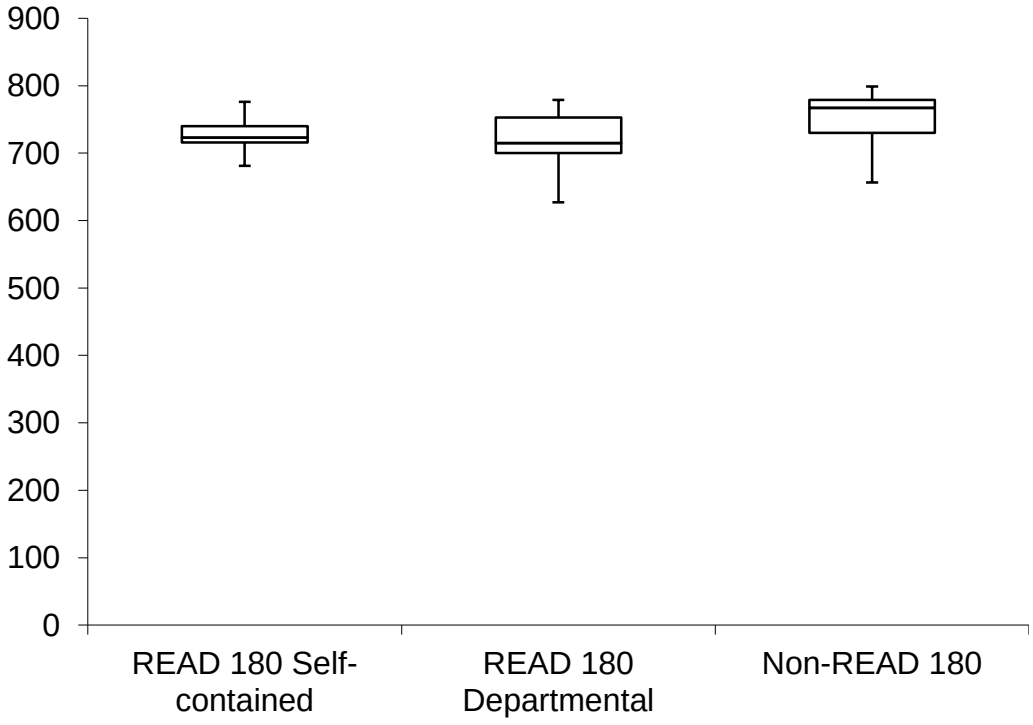

Figure 6. Distribution of TCAP Math Scores for READ 180 and Non READ 180 Classrooms

Research Question 6

Are there significant differences regarding only READ 180 students' 2009-2010 improvement scores (posttest minus pretest) in reading-language arts as measured by the DE with regard to classroom organization (READ 180 self-contained, READ 180 departmentalized) and between genders?

The nulls H_06_1, H_06_2, and H_06_3 address these questions.

H_06_1 There is no significant difference in DE improvement scores in reading-language arts in students in READ 180 departmental and READ 180 Self-contained classes.

H_06_2: There is no significant difference in DE improvement scores in reading-language arts between male and female students.

H_06_3: The DE Reading-language arts test scores for READ 180 students do not significantly vary by classroom organization as a function of gender.

A two-way analysis of variance (2 x 2 ANOVA) was conducted to evaluate the effects of DE Reading-Language Arts test improvement scores by classroom organization and by gender. The means and standard deviations for DE improvement scores as a function of the factors are presented in Table 6. The ANOVA indicated a significant difference in reading-language arts scores between Read 180 departmental and READ 180 self-contained classrooms $F(3, 176) = 6.42$, $p = .012$, $\eta^2 = .01$. The READ 180 departmental student means tended to be higher than the means of READ 180 self-contained students. However, no significant difference was indicated between male and female students $F(3, 176) = 2.17$, $p = .142$, $\eta^2 = .01$, or between the student means in the different class organizations with regard to gender $F(3, 176) = 1.19$, $p =$

.278, η^2 = .01. Null hypotheses $H_0 6_1$ was rejected and $H_0 6_2$, and $H_0 6_3$ were retained. The distributions of scores by classroom organization with regard to gender are reported in Figure 7.

Table 6

Means and Standard Deviations of DE Improvement Scores by Classroom Organization with Regard to Gender

Classroom organization	*gender*	*n*	*M*	*SD*
READ 180 departmental	M	81	2.75	6.54
	F	59	0.03	5.24
READ 180 self-contained	M	22	-1.09	5.33
	F	18	-1.50	5.28

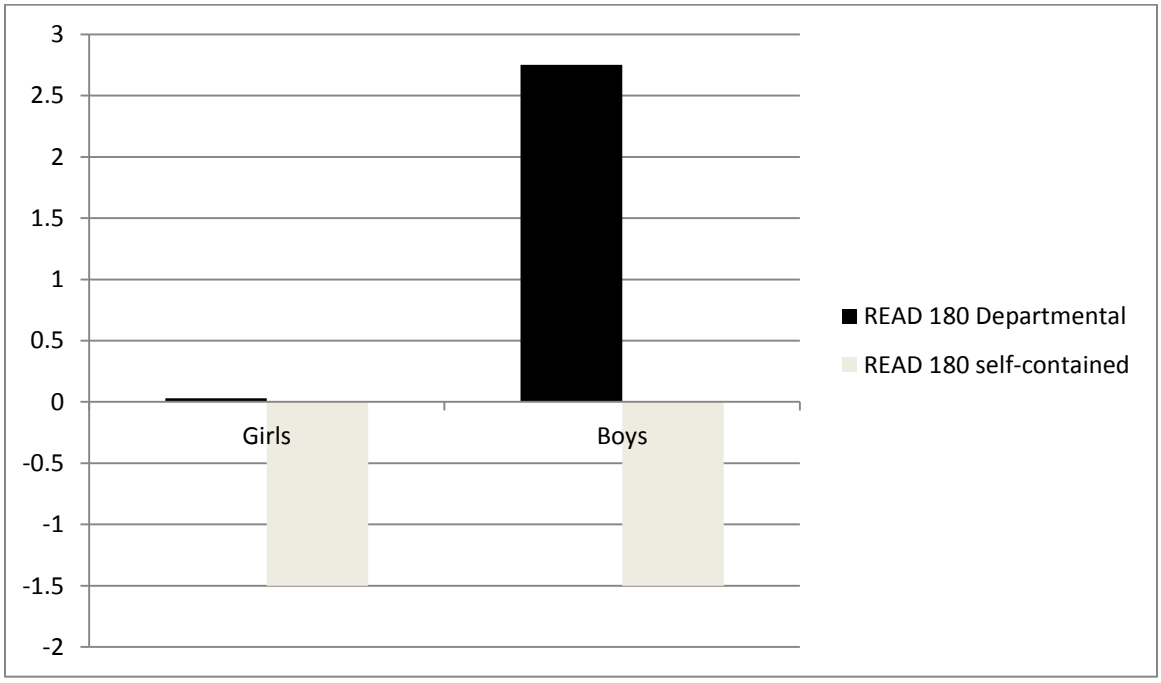

Figure 7 Distribution of READ 180 DE Reading-Language Arts Improvement Scores by Classroom Organization with regard to Gender

Research Question 7

Are there significant differences regarding only READ 180 students' 2009-2010 improvement scores (posttest minus pretest) in reading-language arts as measured by the SRI with regard to classroom organization (READ 180 self-contained, READ 180 departmentalized) and between male and female students?

The nulls H_07_1, H_07_2, and H_07_3 address these questions.

H_07_1: There is no significant difference in SRI improvement scores in reading-language arts in students in READ 180 departmental and READ 180 self-contained classes.

H_07_2: There is no significant difference in SRI improvement scores in reading-language arts between male and female students.

H_07_3: The SRI Reading-Language Arts test scores for READ 180 students do not significantly vary by classroom organization as a function of gender.

A two-way analysis of variance (2 x 2 ANOVA) was conducted to evaluate the effects of SRI Reading-Language Arts test improvement scores by classroom organization and by gender. The means and standard deviations for SRI improvement scores as a function of the factors are presented in Table 7. The ANOVA indicated no significant difference in SRI reading-language arts improvement scores between Read 180 departmental and READ 180 self-contained classrooms $F(3, 176) = 2.07$, $p = .152$, $\eta^2 = .01$, between male and female students $F(3, 176) = .38$, $p = .537$, $\eta^2 = .01$, or between the student means in the different class organizations with regard to gender $F(3, 176) = .04$, $p = .835$, $\eta^2 < .001$. Null hypotheses H_07_1, H_07_2, and H_07_3 were

retained. The distributions of scores by classroom organization with regard to gender are reported in Figure 8.

Table 7

Means and Standard Deviations of SRI Improvement Scores by READ 180 Classrooms with Regard to Gender

Classroom organization	*gender*	*n*	*M*	*SD*
READ 180 departmental	M	81	179.94	131.25
	F	59	159.66	132.35
READ 180 self-contained	M	22	210.09	130.62
	F	18	200.06	170.27

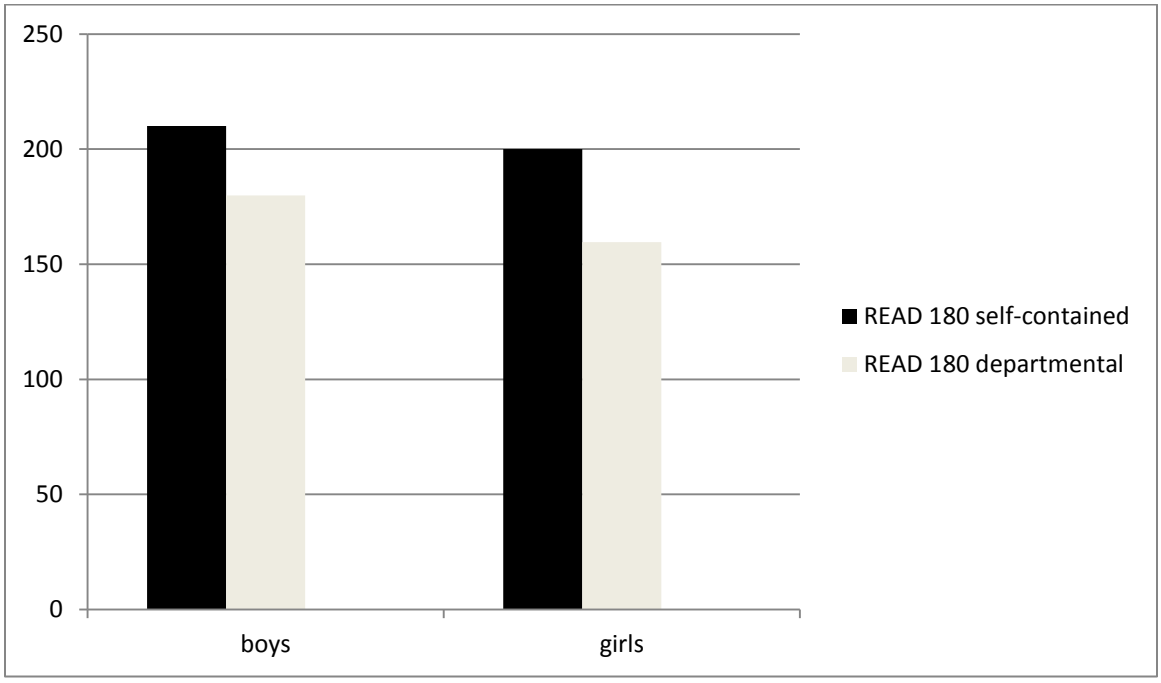

Figure 8: Distribution of READ 180 SRI Reading-Language Arts Improvement Scores by Classroom Organization with regard to Gender

Research Question 8

Are there significant differences with regard to only READ 180 students' 2009-2010 scores in reading-language arts as measured by the TCAP with regard to classroom organization and between male and female students?

The nulls $H_0 8_1$, $H_0 8_2$, and $H_0 8_3$ address these questions.

$H_0 8_1$: There is no significant difference in TCAP scores in reading-language arts in students in READ 180 departmental and READ 180 self-contained classes.

$H_0 8_2$: There is no significant difference in TCAP scores in reading-language arts between male and female students.

$H_0 8_3$: The TCAP Reading-Language Arts test scores for READ 180 students do not significantly vary by classroom organization as a function of gender.

A two-way analysis of variance (2 x 2 ANOVA) was conducted to evaluate the effects of TCAP Reading-Language Arts test scores by classroom organization and by gender. The means and standard deviations for TCAP scores as a function of the factors are presented in Table 8. The ANOVA indicated no significant difference in TCAP Reading-language arts scores between Read 180 departmental and READ 180 self-contained classrooms $F(3, 176) = .03$, $p = .854$, $\eta^2 < .01$, between male and female students $F(3, 176) = 1.81$, $p = .180$, $\eta^2 = .01$, or between the student means in the different class organizations with regard gender $F(3, 176) = 1.02$, $p = .314$, $\eta^2 = .01$. Null hypotheses $H_0 8_1$, $H_0 8_{2,}$ and $H_0 8_3$ were retained. The distributions of scores by classroom organization with regard to gender are reported in Figure 9.

Table 8

Means and Standard Deviations of TCAP Scores for READ 180 with Regard to Gender

Classroom organization	*gender*	*n*	*M*	*SD*

READ 180 departmental	M	81	714.73	27.48
	F	59	716.34	26.25
READ 180 self-contained	M	22	710.77	26.11
	F	18	722.06	23.53

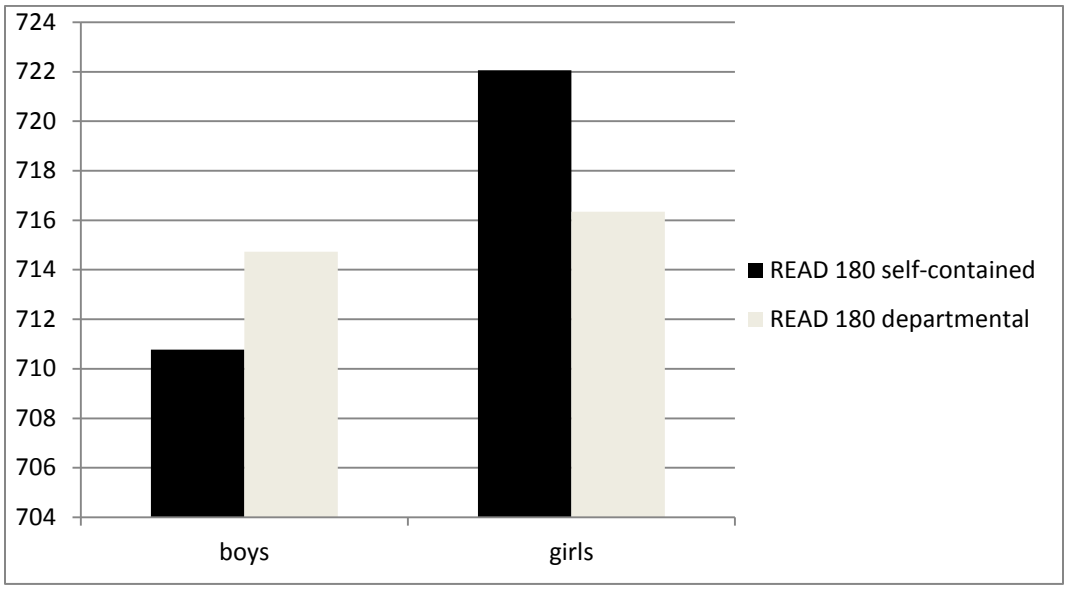

Figure 9 Distribution of TCAP Reading-Language Arts Scores by Classroom Organization with Regard to Gender

CHAPTER 5

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was twofold. The primary goal was to determine whether academic achievement as indicated by the Tennessee Comprehensive Assessment Program test (TCAP), the Discovery Education Assessment test (DE), and the Scholastic Reading Inventory test (SRI) scores were different for READ 180 students in self-contained classrooms, READ 180 students in departmental classrooms, and Non-READ 180 students. Classroom organizational structure at the intermediate grades level is a highly debated issue. The READ 180 program is a highly structured model of the reading-language arts block. However, there are few documented studies on how to schedule classes for at-risk students. Teachers and administrators of intermediate school students will benefit from a quantitative study that evaluates the relationship between classroom organizational structures and the success of READ 180 students. The population consisted of 280 students. The target population attended classes in either a READ 180 self-contained classroom, a READ 180 departmental classroom, or a Non-READ 180 classroom; a comparison of male and female students within each READ 180 organization was also included in the analyses. Another goal of the study was to determine if there was a relationship between gender and test scores for students participating in either READ 180 self-contained or READ 180 departmental classes.

Summary of Findings

The statistical analyses were governed by the research questions introduced in Chapter 1 and clarified in Chapter 3. The dependent variables were the scores on the various tests. The test scores were collected by principals at the schools with the READ 180 program. The independent variables were the types of classroom organization and gender.

Research question 1 addressed the differences in students' improvement scores in reading-language arts as measured by the DE test with regard to classroom organization. An analysis of variance (ANOVA) provided evidence of significant differences in the means of improvement scores among the three classroom organizations. The Non-READ 180 students' mean (M = 1.92, SD = 5.27) improvement scores were .32 points higher than the READ 180 self-contained means (M = 1.61, SD = 6.15), and 3.19 points higher than departmental students' mean (M = -1.28, SD = 5.25) improvement scores. A post hoc comparison concluded a significant relationship between READ 180 self-contained and Non-READ 180 test scores with a p = .001, as well as between the READ 180 self-contained and the READ 180 departmental test scores with p = .007.

Research question 2 pertained to the differences in students' improvement scores in reading-language arts as measured by SRI with regard to READ 180 classroom organization. The improvement score means for READ 180 self-contained (M 205.57, SD 147.83) and READ 180 departmentalized (M = 171.39, SD = 131.62) , with p = .160, were about the same indicating no significant differences between classroom organizations in SRI improvement scores.

The analysis of research question 3 involved students' scores in reading-language arts as measured by the TCAP with regard to classroom organization. A significant difference in the means of TCAP scores was discovered between the three classroom organizations. Non-READ 180 students' means ($M = 747.64$, $SD = 25.31$) were 32.26 points higher than READ 180 departmental class means ($M = 715.41$, $SD = 37.07$), and 31.79 points higher than READ 180 self-contained class means ($M = 715.85$, $SD = 26.88$). A post hoc comparison concluded a significant relationship between READ 180 self-contained and Non-READ 180 test scores with $p < .001$, as well as between the Non-READ 180 and the READ 180 departmental test scores with $p < .001$.

Research question 4 concentrated on differences in students' improvement scores in math as measured by DE with regard to classroom organization. The ANOVA provided the results a significant difference in the improvement score means between the three classroom organizations. Non-READ 180 improvement score means ($M = 2.87$, $SD = 4.82$) were 1.10 points higher than READ 180 self-contained ($M = 1.78$, $SD = 3.87$) with $p = .201$, and 1.62 points higher than READ 180 departmental class means ($M = .125$, $SD = 4.30$) with $p = .010$.

The analysis of research question 5 was devoted to finding differences in students' scores in math as measured by TCAP with regard to classroom organization. The improvement score means for Non-READ 180 ($M = 751.88$, $SD = 37.09$) were 25.68 points higher than READ 180 self-contained ($M = 726.20$, $SD = 21.29$) with $p < .001$, and 33.59 points higher than READ 180 departmental ($M = 718.29$, $SD = 34.52$) with $p < .001$.

Research question 6 addressed the differences regarding only READ 180 students' improvement score in reading-language arts as measured by DE with regard to classroom organization and between male and female students. A two way ANOVA provided evidence of a significant interaction between improvement scores within READ 180 departmentalized (M = 1.61, SD = 6.15) and READ 180 self-contained (M = -1.27, SD = 5.25) with p = .012. However, no evidence of a significant difference was found between the means of improvement scores for males (M = 1.93, SD = 6.47) and for females (M = -.32, SD = 5.25), with p= .142, as well as the relationship of means for self-contained males (M = -1.09, SD = 5.33) and-self-contained females (M = -1.50, SD = 5.28) compared to means of departmentalized males (M = 2.75, SD = 6.54) and departmentalized females (M = 0.03, SD = 5.24) were about the same indicating no significant interaction with p = .278.

Research question 7 pertained to the differences regarding READ 180 students' improvement scores in reading-language arts as measured by the SRI with regard to classroom organization and between male and female students. A two way ANOVA provided evidence of no significant difference between improvement scores within READ 180 departmentalized (M = 169.80, SD = 11.62) and READ 180 self-contained (M = 205.07, SD = 21.58) with p = 152. The means of improvement scores for males (M = 195.02, SD = 16.32) and for females (M = 179.86, SD = 18.28) with p = .537, as well as the relationship of means for self-contained males (M = 210.09, SD = 130.62) and-self-contained females (M = 200.06, SD 170.27) compared to means of departmentalized males (M 179.94, SD = 131.25) and departmentalized females (M =

159.66, SD = 132.35) were about the same indication no significant interaction with p = .835.

The analysis of research question 8 involved the differences in READ 180 students' scores in reading-language arts as measured by the TCAP with regard to classroom organization and between male and female students. A two way ANOVA provided evidence of no significant difference between scores within READ 180 departmentalized (M = 715.41, SD = 26.88) and READ 180 self-contained (M = 715.85, SD = 25.31) with p = .854. The means of scores for males (M = 713.88, SD = 27.12) and for females (M = 717.68, SD = 25.60) with p = .180, as well as the relationship of means for self-contained males (M = 710.77, SD = 26.11) and-self-contained females (M = 722.06, SD = 23.53) compared to means of departmentalized males (M = 714.73, SD = 27.48) and departmentalized females (M = 716.34, SD = 26.25) were about the same indication no significant interaction with p = .314.

Conclusions

The study focused on comparisons in academic achievement between READ 180 students in different classroom organizations and Non-READ 180 students. Focus was placed on relationships between test scores, classroom organizations, and gender. This study provided evidence, although not conclusive, that Non-READ 180 students had higher test scores than READ 180 students on all tests evaluated. Students qualify for READ 180 on the basis of being 2 to 3 grade levels behind in reading. Chan (2004) claimed gifted students in self-contained classrooms had higher achievement scores than peers in traditional classroom organizations, however, according to this study, self-

contained classrooms are not significantly better for struggling students. As found in research questions 1 and 4 self-contained READ 180 students outperformed READ 180 departmental students on DE reading-language arts and math and TCAP reading. No significant difference was found by SRI scores or TCAP scores for either READ 180 self-contained or READ 180 departmental classrooms.

The results of the present study are similar to Marzono et al. (2003) research that concluded classroom organization was not an important factor in achievement. The results of the analyses for research questions 6, 7, and 8 indicated no significant difference existed between the means of DE, TCAP, or SRI scores as a function of gender or classroom organization. This confirms Slavin's (1989) suggestion of self-containing classrooms on the basis of ability not enhancing achievement in elementary schools. Females in READ 180 self-contained tended to have higher scores on SRI and TCAP reading, and females in departmental classes had higher improvement scores on DE reading-language arts. Males in READ 180 departmental tended to have higher improvement scores on TCAP and DE reading-language arts, whereas males in READ 180 self-contained tended to have higher improvement scores on SRI.

Recommendations for Practice

The results of this study suggest that classroom organization does not have a significant positive relationship with test scores of students in the READ 180 program. Intermediate level schools do not have a standard classroom organization. It appears, at least from this study that one is not significantly better at improving test scores than another, so principals should focus more on what goes on inside the classroom than how the class was made up. Schools should evaluate their READ 180 program in an

effort to minimize disruptions of class changes and improve time on task for all classroom organizations. Davidson and Miller (2002) stated that the READ 180 program includes software, practice, and instruction that customize learning according to students' assessed abilities to build success. READ 180 teachers in both self-contained and departmental organizations should focus on this individualization to help their students succeed. Wheeler (2010) asserted that peace and caring in the classroom provides stability and may be more important than school day schedules. Therefore, schools should provide ongoing training and help READ 180 teachers to reach these goals. Technology based innovations often focus on the supply of equipment, but adequate funding is needed for ongoing training, proper staffing, and maintaining and upgrading the program as new technologies are developed. The READ 180 program has a high dependency on computers. When the computers are not working or are running slow, instruction is interrupted. School systems that purchase the program need to be aware of the ongoing costs of upgrading hardware and server space to accommodate the high demand of the program. These down times affect improvement.

The READ 180 program emphasizes small group interactions Regular classroom reading students could benefit from the advantages of small group instruction. The instructional model of READ 180 allows for routine, organization, and individual pacing, as well as a degree of choice and mobility, all of which could benefit readers at all levels of progress. This highly structured environment may provide more support for struggling readers than regular reading class. A transition program would be beneficial

to help students adjust to the freedom of regular reading classes. Schools with READ 180 programs should consider this aspect when promoting students out of the program.

READ 180 students test into the program at two to three grade levels behind. To assess their progress in reading they are given TCAP and DE tests which has a readability level of fourth grade for all fourth graders and fifth grade for all fifth graders no matter what their individual reading level. The technology of the SRI test allows the test to change ability levels as the test taker progresses or regresses. Teachers of reading should be cognizant of how to effectively assess a student's abilities on their own academic level. This way they could pursue to allow the most accurate type of intervention for each child.

Recommendations for Further Research

Educators struggle daily to develop more effective strategies to improve test scores. A more in depth study of the effectiveness of the READ 180 program and its effects on the test scores of struggling readers should be pursued. Additional research is needed to explore the effects of the READ 180 program considering ESL status, ethnicity, and socioeconomic status on academic achievement. Further study of possible transition support for READ 180 students is also an area of need. These students leave a highly structured environment and move into a situation that is very dependent upon the students' self-motivation. A transitional class or program could be beneficial. A longitudinal study could exam the long-term effects of READ 180 on graduation rates, disciplinary actions, ACT/SAT scores, or dropout rates. A study is

needed on READ 180 student progress as compared to at risk peers who are not in the READ 180 program.

A longitudinal, qualitative study to determine the positive aspects of self-contained classrooms would provide administrators the proof they need to justify using that classroom organization with younger students. Logic would indicate that students who are struggling in reading would have difficulty taking standardized tests that are written above their individual reading level. Research should focus on how to best test students on their individual level to obtain a more accurate assessment of growth. Classroom organization does not appear to be related to test scores; however, further research should be conducted to examine class configuration and the effects of attendance and disciplinary actions while considering the variables of gender, ESL status, ethnicity, and socioeconomic status on academic achievement.

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APPENDICES

Appendix A

Permission to Conduct Research

Amanda Cannon
Teacher
Seymour Intermediate School
212 N Pitner Road
Seymour, TN 37865
(865)609-0030

Dr. Debra Cline
Director of Curriculum and Instruction
Central Office
Sevierville, TN 37865
(865)453-4671

December 9, 2010

Dear Dr. Cline,

I am currently working on my dissertation for East Tennessee State University. I would like to gain your permission to request a summary of test scores from principals concerning READ 180 students. This data will be obtained without any identifiable information of individual students. The purpose of this study is to determine if classroom structure is a factor in the success of READ 180 students. The study will analyze TCAP, DE, and SRI test scores for the 2009-2010 school year. Thank you for your time and support in this process.

Sincerely,

Amanda Cannon

I herby give Amanda Cannon permission to request test score summaries for research in the Sevier County School System in pursuit of her doctoral study, as long as no identifiable student information is revealed.

Dr. Debra Cline
Sevier County School System

Appendix B

IRB Approval

East Tennessee State University
Office for the Protection of Human Research Subjects • Box 70565 • Johnson City, Tennessee 37614-1707
Phone: (423) 439-6053 Fax: (423) 439-6060

December 3, 2010

Amanda Cannon
7769 Pennyroyal Drive
Knoxville, TN 37920

Dear Ms. Cannon,

Thank you for recently forwarding information regarding "READ 180: Is Classroom Structure Important?".

I have reviewed the information submitted, which includes the completed Form 129.

The determination is that this proposed activity as presented meets *neither* the FDA nor the DHHS definition of research involving human subjects. Therefore, it does not fall under the purview of the ETSU IRB and does not require ETSU IRB approval.

Thank you for your commitment to excellence.

Sincerely,

Chris Ayres, Chair
ETSU Campus Institutional Review Board

Full AAHRPP Accreditation

Accredited Since December 2005

VITA

AMANDA C. CANNON

Personal Data:	Date of Birth: February 3, 1970
	Place of Birth: Maryville, Tennessee
	Marital Status: Married
Education:	Public Schools, Maryville, Tennessee
	B.S. Elementary Education, East Tennessee State University, Johnson City, Tennessee, 1991
	M.A. Curriculum and Instruction, Lincoln Memorial, Harrogate, Tennessee, 1994
	Ed.S. Holistic Teaching and Learning, University of Tennessee, Knoxville, Tennessee, 1996
	Ed.D. Educational Leadership and Policy Analysis, East Tennessee State University, Johnson City, Tennessee, 2011
Professional Experience:	Teacher, Pigeon Forge Primary School; Pigeon Forge Tennessee, 1993-1997
	Teacher, Seymour Intermediate School; Seymour, Tennessee, 1997- present