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**HARDING**  
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READ 180 PARTICIPATION, ELL SERVICE LENGTH, AND YEAR ON LITERACY  
AND MATHEMATICS ACHIEVEMENT FOR MIDDLE SCHOOL STUDENTS

by

Paul A. Griep

Dissertation

Submitted to the Faculty of

Harding University

Cannon-Clary College of Education

in Partial Fulfillment of the Requirements for

the Degree of

Doctor of Education

in

Educational Leadership P-20

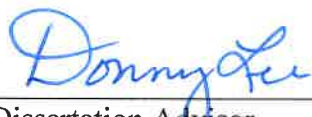
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To the students and faculty members that I have been privileged to serve throughout my career. The success and achievement of our students are why I work diligently each day.

## **DEDICATION**

This dissertation is dedicated to my mother, Carlene Griep. Because of her continuous nurturing and confidence in me, I have been able to reach my dreams in life. God has used my mother to be an example of unconditional love, a positive spirit, and a role model. Her example has meant more than she will ever know.

## **ABSTRACT**

by  
Paul A. Griep  
Harding University  
December 2015

Title: READ 180 Participation, ELL Service Length, and Year on Literacy and Mathematics Achievement for Middle School Students (Under the direction of Dr. Donny Lee)

The purpose of this dissertation was to add to the limited available research. In both hypotheses, the independent variables were whether or not the student used the READ 180 program, the number of years the student received ELL services in the United States (6 years or less or more than 6 years), and the year tested (2011 or 2012). The dependent variables for the first hypothesis were literacy and mathematics achievement measured by scaled scores obtained on the seventh grade Arkansas Augmented Benchmark Literacy and Mathematics examinations. The dependent variables for the second hypothesis were literacy and mathematics achievement measured by scaled scores obtained on the eighth grade Arkansas Augmented Benchmark Literacy and Mathematics examinations.

This causal-comparative design used seventh and eighth grade students in three urban middle schools and three junior high schools in northwest Arkansas. The six schools were chosen based on their similar student demographics of grade configuration, ethnicity, and the implementation of the READ 180 program. The study included 743 seventh grade and 649 eighth-grade students. Of the total sample, 248 of the students in



each school who were participating in the READ 180 program were compared to another 1,144 students who were not participating in the READ 180 program. Within the group of students participating in the READ 180 program, I identified the students who received ELL services of 6 years or less or more than 6 years. Non-ELL students and those at the ELL Level 3 or higher were not eligible to participate in the READ 180 program.

A factorial MANOVA was used to analyze the data for each of the hypotheses. The results of the multivariate test results for the first hypothesis indicated there was a significant difference among the groups for each of the three independent variables. There was not a statistically significant 3-way interaction between length of time receiving ELL services, participation in READ 180, and year tested. There were no 2-way interactions between the independent variables. A between-subjects test showed the main effects were significant for all three independent variables. Consequently, the first hypothesis was rejected because significant differences existed in scaled literacy and mathematics scores based on the main effects of year, participation in READ 180, and ELL service length. Further analysis showed that students in seventh grade scored significantly higher in 2012 than in 2011 on the examination. In mathematics, there was not a significant difference. Furthermore, students who were not in the READ 180 program scored significantly higher than those who participated in READ 180 on the seventh grade exams. Finally, students who received ELL services for more than 6 years scored significantly higher than those who received services for 6 years or less on the seventh grade examinations.

When reviewing the multivariate test results for the second hypothesis, there was a significant difference among the groups for each of the three independent variables. There was not a statistically significant 3-way interaction between length of time receiving ELL services, participation in READ 180, and year tested. There was an interaction between participation in READ 180 and ELL service length. A between-subjects test showed the main effects were significant for all three independent variables. Consequently, the second hypothesis was rejected because significant differences existed in scaled literacy and mathematics scores based on year, participation in READ 180, and on ELL service length. Students in eighth grade scored significantly higher in 2012 than in 2011 on the literacy and mathematics exams. Furthermore, students who were not in the READ 180 program scored significantly higher than those who participated in READ 180 on the eighth grade exams. Finally, students who received ELL services for more than 6 years scored significantly higher than those who received services for 6 years or less on the eighth grade literacy and mathematics examinations.

The results of this study were consistent with work published by independent sources. When generalizing the results of this study to other groups, it was important to remember several elements. First, academic vocabulary and knowledge were acquired as a result of three important factors: time, effective pedagogy, and the amount of formal education in a student's native language. Furthermore, it was difficult to generalize the findings of this study to other populations. The findings indicated that READ 180 was not an effective intervention that could assist with language acquisition. Furthermore, as the state of Arkansas transitions from the AABE to testing based on the Common Core State Standards, it will be difficult to generalize the findings of this study.

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## CHAPTER I

### INTRODUCTION

In 1981, the United States Secretary of Education established the National Commission on Excellence in Education. Because of this effort, the Commission published a report entitled, *A Nation at Risk: The Imperative for Educational Reform*. This document outlined deficiencies within the nation's educational system. Problems indicated by the Commission included the lack of depth of the country's K-12 educational curriculum, the low expectations of students, the lack of time devoted to students and educators to schoolwork, and the lack of quality, life-long teachers (United States Department of Education [DOE], 1983).

As a result, the United States became committed to searching for solutions that would dramatically enhance the United States' educational system. Consequently, in 1994, President William Clinton signed the *Improving America's Schools Act*. This legislation, which reauthorized the *Elementary and Secondary Education Act* of 1965, provided increased funding for Title I schools, promoted safe and drug-free schools, encouraged teacher professional development, and supported technology within the classroom (United States DOE, 1994). Furthermore, the legislation required states to develop content standards, to administer assessments aligned with the standards, and to construct an accountability system for schools. The *Improving America's Schools Act* guided the practices of America's educational system until President George W. Bush

signed the *No Child Left Behind (NCLB) Act* into law. NCLB, which was the second reauthorization of the Elementary and Secondary Education Act, underscores the importance of standardized testing for all students. Paige, former United States Secretary of Education, indicated that the goal of NCLB was to have all students, regardless of their backgrounds, achieve high levels. Consequently, publically funded schools face increased accountability for the education of all students.

NCLB includes many new provisions for schools that receive federal funding, none of which have been achieved by the dates specified in the legislation. First, all students must be instructed by highly qualified teachers. Furthermore, by 2013-2014, all students must be proficient in mathematics and reading with *proficiency* determined through statewide-standardized examinations annually administered to all students, Grades 3-8 (Illinois State Board of Education, n.d.). The goal is for each subpopulation of students (e.g. combined population, ethnic group, socioeconomic group, English Language Learners, and students with disabilities) to demonstrate proficiency.

Because of NCLB, schools receive annual report cards. These reports provide insight into the students' progress, the qualifications of the teaching staff at the school, and the overall performance of the institution (United States DOE, 2003a). Politicians endorsed NCLB as a method to close the achievement gap for minority students, English Language Learners (ELLs), students from poverty, and students with disabilities.

Although NCLB was signed into law by President George W. Bush on January 8, 2002, the States were given time to develop policies to meet the new federal mandates. Each state had the opportunity to develop specific timelines to meet the 2013-2014 proficiency mandates. Despite this flexibility, the consequences for failing to meet the



requirements of NCLB were stringent. Schools that were underperforming were at risk of losing federal funding, losing local control, and receiving other sanctions determined by individual states (National Education Association, n.d.). Additionally, parents had the right to obtain supplemental services for their children and to send their students to a performing school if the respective institution does not meet the requirements of NCLB (Ravitch & Chubb, 2009). Statistics throughout the nation indicated that schools were struggling to meet the mandates of NCLB. According to the Arkansas DOE (2010a), only 41% of public schools within the state met *Achieving* status for the 2009-2010 academic year. The other 59% of public schools were either on *Alert* status or in some form of institutional restructuring.

As the 2013-2014 school year approached, the federal government was examining whether or not to extend, to reauthorize, or to modify the NCLB legislation. According to United States Secretary of Education Duncan (2011) “NCLB is creating a slow-motion educational train wreck for children, parents and teachers. Under the law, an overwhelming number of schools in the country may soon be labeled as failing, eventually triggering impractical and ineffective sanctions” (para. 8). Duncan indicated that, although expectations will continue to remain high for schools, institutions should have more flexibility to meet the mandates (Brenchley, 2011).

### **Statement of the Problem**

The purposes of this study were two-fold. First, the purpose of this study was to determine the effects of READ 180 intervention (*participated or did not participate*), ELL service length ( $6 < \text{ELL} \leq 6$ ), and year (2011 or 2012) on literacy and mathematics achievement as measured by scaled scores obtained on the Arkansas Augmented

Benchmark Literacy and Mathematics examinations for seventh grade ELLs in a school district in northwest Arkansas. Second, the purpose of this study was to determine the effects of READ 180 intervention (*participated* or *did not participate*), ELL service length ( $6 < \text{ELL} \leq 6$  yrs), and year (2011 or 2012) on literacy and mathematics achievement as measured by scaled scores obtained on the Arkansas Augmented Benchmark Literacy and Mathematics examinations for eighth grade ELLs in a school district in northwest Arkansas.

### **Background**

The invention of the personal computer in the late 1970s has changed the day-to-day operations of business and industry. Educators and researchers now strive to use computers and innovative software to increase teaching effectiveness and student achievement. The need for innovative educational strategies is high. According to recent statistics, nearly 8 million students, between 4th and 12th grades, have difficulty reading at grade level. Furthermore, statistics reveal that 20% of young adults are functionally illiterate (Hasselbring & Goin, 2004). Public schools within the United States are currently facing a new, difficult challenge with the influx of ELLs. These students, whose primary language is not English, have increased dramatically over the past 2 decades. According to the United States DOE (2008), there were 10.5 million school-aged ELLs in 2006. This statistic will increase to nearly 30% of all students by the year 2015. Consequently, traditional teacher-centered pedagogy will not be sufficient to increase student achievement and enable school districts to meet the demands of NCLB.

Because of NCLB and its increased accountability, schools are examining non-traditional methods to increase student achievement. These methods include providing

instruction via computer software. With 100s of curriculum software titles on the market and limited funding for educational programs, administrators must carefully ascertain whether it is more beneficial to purchase assistive technology or to invest in traditional tutoring. If a school district wishes to invest in computer-based instruction (CBI), it is important to determine if the software package (a) has worked in other districts, (b) is aligned with state frameworks, (c) is budget friendly, and (d) supplements or replaces direct instruction (Ringstaff & Kelley, 2002).

Educational software has evolved since its introduction nearly 2 decades ago. According to a study conducted by Chen-Lin and James Kulik (1991), CBI usually produced a positive effect on student achievement. According to their research, “CBI programs raised student examination scores by 0.3 standard deviations in the average study, a moderate but significant effect” (p. 75). Kulik and Kulik (1991) also demonstrated that CBI reduced the amount of time needed for instruction. After the publication of this research, many educators believed that CBI would transform schools because of its ability to deliver effective, efficient instruction to academically deficient students.

The first generation of educational software emphasized drill and practice exercises. The initial software packages functioned on the Disk Operating System for personal computers or the Apple’s Sophisticated Operating System. The software provided a rough explanation and presentation of academic concepts (Case & Truscott, 1999). Furthermore, most of the software focused on the verification of whether an answer had been correctly selected by the user (Kulhavy & Stock, 1989). As computer technology has evolved (e.g. interactive multimedia capabilities and the ability to

navigate online), educational software has appealed more to students and teachers (Green, 2005). Computer software designers have also developed programs to deliver individualized instruction that focuses on the deficiencies of each student. Through the process of elaboration, the software can strategically assist students toward the correct answer (Kulhavy & Stock, 1989). Because of the improvements in technology and the research proven success of CBI, the number of institutions that use computer software, from pre-kindergarten to higher education, has more than doubled over the past decade. (Mason & Bruning, n.d.).

### **An Outline of the READ 180 Program**

The initial concepts behind the READ 180 program began in 1985. During this time, Hasselbring, head of the Cognition and Technology Group at Vanderbilt University, began to develop a system that used individual pupil achievement data to scaffold literacy instruction (Scholastic, 2011). Shortly after developing this new system, Hasselbring collaborated with Goin at the University of Central Florida. Together, they assisted Orange County's public school system, which suffered from poor literacy scores. Educators referred to their work as the Orange County Literacy Project. Because of the work accomplished via the Orange County Literacy Project, Scholastic began to collaborate with Hasselbring and Goin (Scholastic, 2006).

Within a professional paper, Hasselbring and Goin (2004) indicated that the purpose of the READ 180 program was not to replace classroom teaching. Rather, READ 180 serves as a supplemental program that enhances traditional literacy and reading instruction. Typically, students attend the READ 180 course in conjunction with a traditional English class for a 90-minute block. Within the READ 180 classroom, up to

18 students receive instruction at three different stations. One group of students works with the READ 180 instructional software; the second group of students receives small-group, differentiated instruction; and the third group engages in independent reading. Students rotate to a new group every 30 minutes.

### **The READ 180 Software**

Scholastic (2005), the publisher, described the READ 180 computerized program as *intelligent software*. The software collects “data based on individual responses and adjusts instruction to meet each student’s needs at his or her level” (Scholastic, 2009b, p. 8). The intent of the software is to motivate students by allowing them to maintain control over their learning. The READ 180 software is able to assist native English speakers and ELLs by focusing on several domains underscored by the National Reading Panel (2000) including phonemic awareness, phonics, fluency, vocabulary, and comprehension. According to Marzano, Pickering, and Pollock (2002), it is vital to expose students to new vocabulary when promoting literacy instruction. READ 180 achieves this goal by using the Reading Lab, one of the three components of the computer software. Within this component, short video clips introduce vocabulary to students. According to Green (2005), this is beneficial because students are able to acquire vocabulary and word meaning more rapidly through visual cues. After viewing the video, students read a selection of text that corresponds to the vocabulary displayed in the video. If a student has difficulty reading the text and, therefore, cannot answer questions about what transpired, then the program records that the student needs reinforcement within the given area. After the student has mastered all of the key vocabulary, the Reading Lab provides a set of cloze proofing passages. Within these exercises, students practice

reading sentences with the key vocabulary omitted. Students must place vocabulary words in the appropriate blanks. According to a study completed by Coniam (1997), the use of cloze proofing is a meaningful instrument that can determine when a participant has reached vocabulary proficiency.

The second component of the READ 180 software is the Word Lab. According to the publisher, the Word Lab underscores research-based strategies that emphasize “word recognition and the use of phonological processing skills” (Hasselbring & Goin, 2004, p. 14). Within the Word Lab, students review words that were difficult for the participant, as determined by a pretest. The student listens to words using headphones and then records them using his or her voice onto the computer via a microphone. The software conducts a series of exercises that reiterates the child’s pronunciation of the word, followed by a list of written words. The child must match the word identified on the screen with one pronounced. The computer continues these exercises until the student has mastered all of the words. Beck and McGowen (2001), who indicated that students are able to effectively learn academic language and gain proficiency when they are required to speak and reproduce terms, supported this approach. Furthermore, by using the microphone and headphones, ELL and native English students are able to minimize the level of anxiety felt as they learn new vocabulary. A study conducted by Mioduser, Turkaspa, and Leitner (2000) determined that CBI, when combined with printed materials, may significantly increase student achievement in letter naming, word recognition, and phonological awareness.

The final component of the computerized software is the Spelling Lab. The Spelling Lab component design is to “develop and enhance orthographic knowledge and

phonological processing skills by learning how to spell” (Hasselbring & Goin, 2004, p. 15). When beginning the Spelling Lab, students complete a pretest. Words presented within the pretest come directly from the Word Lab. The computer software pronounces each word, uses it within a sentence, breaks it into syllables, and asks the student to spell the word. At any time within the exercise, students may ask the computer for assistance. The Spelling Lab determines which words a student knows how to spell and then works to remediate the participant. A study conducted by Chiappe and Siegel (2002) analyzed 858 native English and ELL elementary grade students to determine if letter knowledge, spelling, and phonological processing related to reading accuracy. Their research demonstrated that the ability to spell directly correlates to the ability to read the text.

### **READ 180: Small Group Instruction and Independent Reading**

Although the computerized software is an important component of the READ 180 program, small-group instruction and independent student reading complement it. Within the small group instruction model, the teacher emphasizes academic language. Furthermore, the teacher provides “targeted and differentiated instruction in vocabulary, academic language, comprehension, writing, and grammar” (Scholastic, 2009b, p. 4). The teacher enhances the small group instruction by using teacher and student-collaboration activities. These methods include, but are not limited to, Think-Pair-Share, Idea Wage, Oral Cloze, Numbered Heads, The Writing Process, and Peer Feedback (Scholastic, 2009b). Furthermore, students use an rBook, a resource provided by Scholastic, which facilitates instruction and provides a record of student growth. Within this setting, students read articles, summarize main ideas and supporting details, highlight academic

language, demonstrate reading comprehension, practice writing paragraphs, and identify components of literature (e.g. theme, setting, and main characters).

The third component of the READ 180 program is the independent reading segment. Within this portion of the program, each student independently reads literature at his or her reading level. The Scholastic Reading Inventory, which is included in the READ 180 program, computes each student's Lexile reading level in order to facilitate teachers (Scholastic, 2006). After the Lexile reading level is computed, the program compiles a customized list of recommended books. Research conducted by Lisle (2006) underscored the importance of reading within a student's zone of proximal development. Specifically, when a student focuses on the text that is slightly above his or her reading level, the student is more likely to develop a deeper understanding of the passage.

### **An Outline of Computerized Mathematics Program**

Most schools will use the READ 180 program to enhance literacy achievement. In order to promote mathematics enrichment, many buildings will use software that focuses on the mathematical needs of students. Some of the more popular mathematics programs include SuccessMaker Mathematics and Help Mathematics. The design of these software programs is similar to READ 180. The design of the mathematics programs is not to replace instruction; rather, the software will determine the deficiencies of each student and thereby provide remediation. As with READ 180, students supplement instruction by using the software for approximately 30 minutes or less each day (Thrall & Tingey, 2003).



## Hypotheses

An initial review of the literature indicated that the publishers of READ 180 believe their program increases student achievement; however, independent studies confirming the success of the READ 180 program were difficult to find, especially with locating studies that involve ELLs who are at the first stages of language acquisition. Therefore, I generated the following null hypotheses.

1. No significant effects of READ 180 intervention (participated or did not participate), ELL service length ( $6 < \text{ELL} \leq 6$  yrs), or year (2011 or 2012) will be observed on literacy achievement and on mathematics achievement as measured by scaled scores on the Arkansas Augmented Benchmark Examination for seventh grade ELLs in a district in northwest Arkansas.
2. No significant effects of READ 180 intervention (participated or did not participate), ELL service length ( $6 < \text{ELL} \leq 6$  yrs), or year (2011 or 2012) will be observed on literacy achievement and on mathematics achievement as measured by scaled scores on the Arkansas Augmented Benchmark Examination for eighth grade ELLs in a district in northwest Arkansas.

## Description of Terms

**Arkansas Augmented Benchmark Examination.** The Arkansas DOE (2010a) defined the Arkansas Augmented Benchmark Examination (AABE) as an assessment that focuses on measuring student performance on items specifically developed by Arkansas teachers and the Arkansas DOE that align with the Arkansas Mathematics and English Language Arts Curriculum Frameworks.

**Computerized-Based Instruction.** Kulik and Kulik (1991) defined CBI as software that is used to “drill, tutor, and test” students in a specific content area (p. 75).

**English Language Learners.** According to the Education Alliance at Brown University (2006), an ELL is a person whose first language is not English. Furthermore, the individual is in the process of learning the English language.

**ELL Services.** Students receiving ELL services are taught by instructors who hold a special ELL teaching certification. These teachers, trained in the process of language acquisition and effective pedagogy, assist students to not only learn high levels of academic content, but also the curriculum.

**Highly Qualified Teacher.** The United States DOE (2004) defined a Highly Qualified Teacher as an individual that is fully certified by the state, possesses a bachelor’s degree or higher from a 4-year institution, and demonstrates competence in the area in which he/she teaches.

## **Significance**

### **Research Gap**

Each day, school administrators face decisions about how to use limited financial resources effectively to educate students. Furthermore, with increased accountability at state and federal levels, schools must work diligently to guarantee that all students, regardless of ethnicity, socioeconomic level, disability, and language proficiency, are learning at proficient or advanced levels in mathematics and literacy (National Education Association, n.d.).

Administrators who attend state or national conferences observe scores of educational programs promoted by publishing companies. Many companies boast that

their products can bring all students to high levels of proficiency. All too often, the programs advertise a *cure all* for education. Unfortunately, these programs often cost thousands of dollars, require intensive staff development, and involve a long-term commitment by the school. Consequently, administrators must make careful decisions. Administrators should not base decisions on whether or not a program is attractive. Rather, they should investigate whether the program has significantly increased student achievement as demonstrated by independent research (Ringstaff & Kelley, 2002).

Over the past 2 decades, many studies have been conducted to determine the general effectiveness of CBI. Overall, CBI may be a useful tool to remediate and to enrich student understanding of literacy and mathematics. However, Kulik and Kulik (1991) indicated that the effectiveness of specific programs is often determined by the design and methods used within the software package, signifying, not all CBI programs are equally effective.

The READ 180 program is not a pure CBI program. Rather, it is a hybrid model that uses reading instruction, independent practice, and CBI. It is a relatively new model lacking many independent studies to demonstrate whether it is effective in significantly increasing student achievement. Furthermore, no independent studies were found that demonstrate whether the READ 180 program is effective with ELLs on the AABE.

### **Possible Implications for Practice**

As a result of this study, administrators throughout Arkansas have additional information to consider whether the READ 180 program significantly increases student achievement for ELLs on the AABE. If the study demonstrates a significant increase in student achievement, school leaders may choose to allocate financial resources to the

READ 180 program. If no appreciable gains in achievement are demonstrated by participation in the program, then administrators may wish to continue to research other educational programs, forms of teaching pedagogy, or other methods of educational support that can assist students.

### **Process to Accomplish**

#### **Design**

I used a factorial multivariate analysis of variance (MANOVA) study in this research project. The three independent variables for the first hypothesis were (a) whether or not the student used the READ 180 program, (b) the number of years the student received ELL services in the United States (6 years or less or more than 6 years), and (c) the year tested (2011 or 2012). The dependent variables for the first hypothesis were literacy and mathematics achievement measured by scaled scores obtained from the seventh-grade Arkansas Augmented Benchmark Literacy and Mathematics Examinations. The three independent variables for the second hypothesis were the same as Hypothesis 1, and the dependent variables were also the same for eighth-grade students.

#### **Sample**

In the first hypothesis, the study used seventh-grade students at three middle schools at a school district in northwest Arkansas. Participants were coded based on whether they participated in the READ 180 program, the number of years they received ELL services in the United States, and the year they tested. In this hypothesis, I compared the scaled scores from the Arkansas Augmented Literacy exam and the Arkansas Augmented Mathematics exam. The second hypothesis used eighth-grade students at

three junior high schools at a school district in northwest Arkansas. The same procedure was followed as the first hypothesis for the eighth-grade students.

### **Instrumentation**

In the fall of 2010, all six schools within the study began full implementation of the READ 180 program with ELLs. In the spring of 2011 and 2012, all students enrolled in the district took the Arkansas Augmented Benchmark Literacy and Mathematics examinations. I compared the difference in the scaled scores between students that participated in the READ 180 program and those that did not participate.

### **Analytical Methods**

To address both hypotheses, I conducted a factorial MANOVA using READ 180 program participation, the number of years the student received ELL services ( $6 < \text{ELL} \leq 6$  yrs), and the year tested (2011 or 2012) as the independent variables. In this hypothesis, I analyzed the literacy and mathematics overall scaled scores on the seventh-grade Arkansas Augmented Benchmark Literacy and Mathematics examinations. To address the second hypothesis, I conducted a factorial MANOVA using the same independent variables as Hypothesis 1. In addition, I analyzed the literacy and mathematics overall scaled scores on the eighth-grade Arkansas Augmented Benchmark Literacy and Mathematics examinations.

## **CHAPTER II**

### **REVIEW OF THE RELATED LITERATURE**

Educators throughout the United States strive to meet the requirements of the No Child Left Behind Act. The federal legislation requires that all students be able to perform at high academic levels, regardless of ethnicity, socioeconomic status, disability, or language proficiency. As a result of these demands, administrators and teachers are seeking the most effective methods to educate students.

Each subpopulation of students possesses specific challenges for educators. ELLs are faced with the difficulty of not only mastering rigorous academic concepts but also mastering the understanding of academic language. The gap between the child's native language and the English language can provide many obstacles for educators and the pupil.

Language experts have debated the best approach when teaching ELLs. Advocates can be found for various approaches including scaffolding, Productive Group Work, the Gradual Release of Responsibility model, cognitively guided instruction, culturally responsive teaching, cooperative learning, instructional conversation, directed reading-thinking activities, and technology-enriched instruction (Lourdes, 2012, Fisher, 2009). Despite these different approaches, there is not a consensus about whether one specific strategy is best or if they should be used in conjunction with one another.

Furthermore, when examining technology-enriched instruction, one may debate whether computer software is a respectable tool that can be successfully used to educate children.

This study was conducted to determine whether the READ 180 program improves ELL student achievement as measured by the AABE in mathematics and literacy. READ 180 is touted as an effective, revolutionary program that can assist all students, including ELLs as they learn how to read at grade level (Scholastic, 2014). Literature that relates to effective literacy instruction and language acquisition components for ELLs was reviewed, including current research that exists for outcomes from the use of the READ 180 program.

### **Arkansas Augmented Benchmark Examination: History and Background**

The Arkansas Comprehensive Testing, Assessment, and Accountability Program (ACTAAP) is authorized as a result of Arkansas Legislative Act 35 (Arkansas DOE, 2010a). Within the legislation, the Arkansas DOE was charged by the state legislature with constructing literacy, mathematics, and science frameworks for the state. Furthermore, Arkansas DOE was also instructed to develop an assessment system that measures the abilities of the state's students according to the content frameworks. The Content Advisory Committees and Bias Review Committees, which are comprised of Arkansas educators, helped construct and approve a set of norm-referenced and criterion-referenced tests. These exams, known as the AABE, are aligned with state frameworks and measure "thinking skills and problem-solving strategies associated with real-life performance expectations for school or work" (Arkansas DOE, 2010a, para. 1). The examinations achieve this goal via multiple choice and open response questions. Students

in Grades 3-8 are given an annual examination that assesses the students' mastery of the frameworks for that grade.

After students complete the AABE, the answer documents are transferred to the Arkansas DOE for scoring. According to Arkansas DOE (2010b), multiple-choice answers are scored by machine. Open-response items are graded by qualified readers. These readers must possess a 4-year college degree in English, mathematics, science, or language arts and be thoroughly trained to grade the responses according to a rubric. The Arkansas DOE indicated that all readers undergo rigorous training that emphasizes consistency and adherence to the rubric. Scoring Directors and other supervisors oversee the grading process to insure quality and consistency. Furthermore, all open-response items are graded by two readers, therefore, increasing the reliability of the scoring process. It should be noted that the training for readers currently consists of a 2-day workshop. If two readers differ significantly on their assessment of a response, a third and possibly, fourth, reader will also score the response.

According to the Arkansas DOE (2010b), students receive scores on the criterion portions of literacy and mathematics AABE. Student performance is recorded as a raw score, then converted to a scaled score. The conversion factor is determined each year in order to adjust for differences in test length or difficulty. Once the scaled score is determined, student performance is categorized as follows: Advanced, Proficient, Basic, or Below Basic. In 2012, a seventh-grade student had to earn a scaled score of 673 in mathematics and literacy, compared to a scaled score of 700 for an eighth-grade student, to be considered proficient. These target scores are important for schools as they try to meet the Adequate Yearly Progress standards established by the state, which determines



the percent of students that must score proficient or advanced on a given examination. Although no research was found to verify the AABE's reliability and validity, the system used by the Arkansas DOE to assess student learning and mastery of material has been approved by the United States DOE and meets all requirements of NCLB (United States DOE, 2006).

### **Programs and Models**

According to the Center for Applied Linguistics (1993), schools throughout the United States educate ELLs by either following an ESL program model or by using bilingual education. Generally, schools will implement an ESL program model if the population of the district is very diverse or if it is too challenging to employ teachers who speak all of the languages represented by the student body. Some state legislatures, such as Arkansas (2009), have established English as the official language. Therefore, English must serve as the primary language for delivering instruction.

Types of ESL program models used throughout the nation include Sheltered English Instruction, Structured English Immersion, Content-Based ESL, and Pull-Out ESL (Dennis, 2014). Within Sheltered English Instruction, students are taught academic concepts using English only. Although English is used to teach students the content area, the focus is to master the academic concepts, not the English language. Teachers scaffold and use simplified English to underscore vocabulary and content. Students placed within Sheltered English Instruction courses are usually placed homogeneously with other ELLs.

Students placed in a Structured English Immersion classroom receive all their instruction in English (CEO, 2000). Teachers use a simplified form of the English

language to teach concepts. In a Structured English Immersion setting, students often spend up to half of the day within the classroom. Much of the time is spent learning English (Ed Week, 2007). As a result of this approach, students master content material and learn English.

Schools may elect to use a pullout program (Dennis, 2014). Under this structure, students may have many classes with native English students. These classes may include electives or core disciplines. Within the pullout program, ELLs will receive English as a Second Language instruction. This is done to assist ELLs with the acquisition of a new language. The level and type of pullout program are determined by the school's needs and population. In larger districts, a school may have a pullout program that assists students in English, mathematics, and other core areas. In districts with a small ELL population, it is more feasible to employ staff members that can supplement traditional classroom activities. These teachers may also travel from one building to another.

Teachers of the ESL pullout program are certified not only in the content area but also undergo specialized training in language acquisition. They adjust their instruction using technology, manipulative, and other strategies that enhance language acquisition. According to California Applied Linguistics (1993), teachers that serve ELLs via a pullout program do not have to speak the student's language.

Schools that do not use an ESL pullout program may choose to assist ELLs through bilingual education models. Examples include a dual language model and transitional bilingual education model (Dennis, 2014). In a dual language model, schools educate English speakers and non-native speakers within the same classroom simultaneously. Instruction is given in English and the native language. The goal of a

dual language program is for all students to learn a new language (i.e. English, Spanish, etc.). Depending on state regulations, English speakers may be able to complete foreign language requirements while learning in a dual language classroom. They will complete assignments and projects in the non-English language. Conversely, non-native English speakers will learn English literacy skills, academic content, and enhanced literacy in their native language.

Schools may also elect to use a transitional bilingual education program. Within this program, students are taught primarily through the native language, and English is used as a second language. There are many formats of a bilingual education program. Schools that use bilingual education may opt for an early-exit bilingual program, a late-exit program, or a 2-way bilingual program. In the early-exit bilingual program, students are given the skills necessary to survive in an English-only classroom. There is limited support for instruction in the child's native language. Generally, the program will serve students for a relatively short period. Schools that use a late-exit program will continue to provide some instruction in the child's native language, even after a child is considered proficient in English. Finally, if a school uses a 2-way bilingual program, then both ELL and English proficient students will be placed in the same classroom. Instruction will be provided in both languages by the instructor. Advocates of a 2-way bilingual approach contend that the system allows all students the ability to become proficient in more than one language (Center for Applied Linguistics, 1993).

According to Center for Applied Linguistics (1993), regardless of the approach used by a school, there are several qualities that will enable students to become successful. These include high expectations of ELLs, rich inservice that will assist all

teachers, strong instructional leadership, collaborative learning, frequent student monitoring, and parental involvement. As a result of these combined efforts, students will become proficient in English and academically strong. Hattie (2012) identified the effect size on different instructional strategies and their influence on achievement. According to Hattie, bilingual education programs have an effect size of 0.37. This demonstrates a positive, moderate effect on learning.

### **Inservice**

According to a report published by the National Reading Panel (n.d.), the ability to read on grade level is essential for success in school. In order to effectively teach students how to read on grade level, educators must be provided rich, meaningful inservice and proper, continuous instructional support. The inservice should focus on strategies that are beneficial in the classroom, proper construction of lessons that promote understanding, ways to incorporate formative assessments within the lesson, and methods to determine the literacy skills of each student.

Although it is vital to analyze data and provide general training that will improve literacy education, many districts also understand the need to provide in-depth training to teachers that will address the needs of ELLs. Such training goes beyond traditional strategies that are used to promote literacy to native English speaking students. According to the Center for Applied Linguistics (2006), “instruction in the key components of reading is necessary—but not sufficient—for teaching language-minority students to read and write proficiently in English” (p. 4). Consequently, many states and school districts provide educators with training that addresses the specific needs of ELLs.

## **English as a Second Language Academy**

In Arkansas, educators may enroll in English as a Second Language Academy. This academy, which is sponsored by the Arkansas DOE, provides teachers with an understanding of language acquisition, the cognitive learning process, how to connect culture and curriculum, and techniques that can be implemented in the classroom (Henderson State University, 2012). Completion of the program and a passing score on the Praxis exam will enable teachers to earn an ESL endorsement on their teaching license. This investment by the State underscores the importance of professional development when teaching ELLs.

Within the English as a Second Language Academy, educators are also provided with a strong background of how to educate ELLs, analyze student data, emphasize culture within lessons, and use the best pedagogical practices to use within the classroom. Educators are exposed to the best research-based strategies that are used throughout the nation, including the knowledge of alphabets, reading fluency, and effective reading comprehension strategies (HSU, 2012).

Although individual teachers and staff members attend literacy training, the responsibility of teaching reading skills is not simply the responsibility of the classroom teacher. Rather, a team of building administrators, teachers, curriculum specialists, and literacy coaches should work cooperatively to achieve this goal. This is achieved through ongoing inservice provided by an academic coach, Professional Learning Communities, the disaggregation of data, and Classroom Walkthroughs. As a result of proper training and instructional support, the teacher will have adequate resources to effectively teach all students literacy skills (National Reading Panel, 2006).

## Strategies with ELLs

Teaching all students to read presents challenges. Unfortunately, ELLs often face many barriers to becoming literate. One of these barriers includes novel academic or social vocabulary unfamiliar to the pupil. Developing fluency with the new words requires time, continuous exposure, and translation. In some cases, especially with academic vocabulary, the pupil may lack the background knowledge or skills to use the new words. Therefore, when becoming literate, the students must not only learn the new word, but also the concept behind the term.

ELLs may also be illiterate in their native languages. This creates a complex issue for educators. According to Center for Applied Linguistics (2006),

Instructional approaches found to be successful with native English speakers do not have as positive a learning impact on language-minority students. It is not enough to teach language-minority students reading skills alone. Extensive oral English development must be incorporated into successful literacy instruction. (p. 4)

Furthermore, according to the Center for Applied Linguistics, in order for pupils to develop the ability to recognize words, teachers must enable students to use decoding, orthographic, and spelling skills. This is an essential step in developing literacy skills and reading comprehension.

Research demonstrates that the use of visual cues can be an effective method employed by teachers to promote language acquisition and literacy. According to Ehri (1987), beginning readers go through two stages using cues. In the first stage, cue readers will normally associate certain elements of a written word with a pronounced word. For

example, a student may associate the “t” in *cat* with the tail of a cat. In this case, the student selects a visually distinctive part of the spelling to help remember the word. Gough and Hillinger (1980) have determined that children use visual cues in learning to read their first 40 words. Unfortunately, students in this phase of reading often forget or confuse words with other words that look similar.

In the second phase of using visual cues, a reader is considered a cipher reader. In this phase, a student understands letter-sound relationships and how to phonetically segment words. Using these skills, a student can apply the previously learned knowledge to effectively pronounce a new, unknown word. This skill is further developed over time as the student grows in his or her ability to read the text.

According to a study conducted by the Alliance for Excellent Education (2007), there are many strategies that are essential in order to improve language development and literacy skills. One of these includes increasing a student’s vocabulary. In a study reported by Cambridge University (2000), it was determined that a relationship exists between a student’s vocabulary and the ability to comprehend text. Generally, students with poor vocabulary have difficulty comprehending text. Furthermore, these students have trouble inferring the meaning of the passage. In a study conducted by Jenkins, Pany, and Schreck (1978), students with a poor vocabulary were able to comprehend text that was familiar to their background or personal experiences. However, in a passage that reached beyond a pupil’s personal experience or background, students with a poor vocabulary struggled with comprehending and inferring meaning from the text.

Although most experts agree on the importance of teaching vocabulary, there are debates about the best approach. Some teachers simply assign a vocabulary list to

students with the expectation that the vocabulary words and their associated meanings will be memorized. However, in a study conducted by Oxford and Crookall (1990), the rote memorization of words and their meanings proved to be unbeneficial. In fact, “merely presenting a list of new or unfamiliar vocabulary items to be encountered in a text, even with definitions appropriate to their use in that text, does not guarantee the induction of new schemata” (p. 11). Rather, it is important to help students develop a context between the printed word and its associated meaning. In a study conducted by Stahl and Fairbanks (1986), it was determined that students who understood the context and the meaning of the vocabulary had substantially better reading comprehension. According to Fisher and Frey (2008), a teacher should differentiate between social and academic vocabulary. This differentiation can be achieved using many strategies, including jigsaw, think-write-pair-share, reciprocal teaching, and Socratic circles. Other experts advocate using Total Physical Response techniques, creating lessons that use aural imagery, and speaking and writing practice (Oxford & Crookall, 1990). A teacher may also wish to use journals, word walls, and cloze paragraphs in order to promote vocabulary.

In addition to learning vocabulary, many literacy experts agree that it is important to teach spelling to students. According to Aarnoutse, Van Leeuwe, Voeten, and Oud (2001), spelling is described as the ability to convert the spoken language into graphic symbols. Through proper instruction, students will begin to develop orthographic processing skills. They will begin to understand the relationships between spelling and sounds. This is due to the fact that spelling can assist students in learning text-sound relationships and rules associated with words (e.g., Ehri & Wilce, 1980, 1987; Kohnen,



Nickels, Brunson, & Coltheart, 2008). The ability to spell may allow a student to decode and pronounce future, unknown words. This skill will help a student increase the amount of text he or she can read, thereby promoting reading comprehension.

In a study conducted by Stuart (1999) with inner-city ELLs, the researcher used two groups of students. The experimental group participated in a phoneme awareness and phonics curriculum. The control group used traditional strategies. As a result of this study, Stuart determined that the experimental group had higher reading standards than the control group.

### **Direct Instruction and Guided Instruction**

With this approach, a teacher uses explicit instruction strategies to directly teach students comprehension strategies and academic language. According to Shippen, Houchins, Steventon, and Sartor (2005), a direct instruction model “involves an emphasis on fast-paced, scripted, well-sequenced, rule-based, and highly focused lessons” (p.176). The method involves three steps. First, the teacher will model the lesson by providing the proper responses. Next, the students are led to the correct answer by providing a step-by-step process. Finally, the teacher will test the students and determine whether or not the skill was mastered. Students who received direct instruction from the teacher were able to increase their vocabulary and comprehension abilities.

According to Shippen et al. (2005), direct instruction models help teachers effectively assist at-risk students, individuals with disabilities, and struggling readers. In a study conducted by Is, it was determined that the struggling readers made significant improvements in reading comprehension. Despite these claims, opponents of the direct

instruction model argue that teachers who employ this method will stifle creativity, promote passive learning, and minimize higher-order thinking skills.

There are many strategies that teachers may use during direct instruction. These include the use of modeling, graphic organizers, and visuals. Examples of visuals include pictures, diagrams, story maps, organizational charts, and academic foldables. As a result of these methods, students will be able to make a connection with the academic concepts and recall vocabulary (Fisher & Frey, 2008).

Although direct instruction is vital, it is also vital to use guided interaction strategies. In this strategy, students and teachers work together to understand the text. The strategy is more teacher-guided than teacher-directed. The teacher uses a series of strategies to “provide rich literature experiences for students so that reading strategies can be naturally constructed with teacher support, but not explicit instruction” (Manset-Williamson & Nelson, 2005, p. 61). Examples of guided interaction strategies include partner interviews, four corners, group presentations, poster projects, and peer-to-peer interactions. According to Guastello and Lenz (2005), one of the important aspects of guided interaction is the ability to have small groups. As a result of this design, the teacher and peers can work with students independently and scaffold instruction, a goal achieved, according to Edvantia (2009) by “listening, speaking, reading, and writing collaboratively about the academic concepts in the text (p. 8).

In a study conducted by Manset-Williamson and Nelson (2005) with middle level students with reading disabilities, the experimental group of students was provided guided reading activities. The control group was provided traditional, teacher-directed

instruction. As a result of their research, the authors contend that guided instruction can assist students with word attack, reading fluency, reading decoding, and comprehension.

### **Independent Reading Practice and the Use of Computer Technology**

Many literacy experts demonstrate that oral reading and silent reading can assist students in learning to read fluently. The National Reading Panel (2000) asserted that guided oral reading may increase reading accuracy, comprehension, and fluency. Furthermore, in a study conducted by Durrell (1969), students that participated in oral reading obtained a higher level of reading comprehension. In contrast, Gardner (2005) indicated that students who participated in silent reading obtained a high level of reading comprehension.

Within a report entitled, *Computer Technology and Reading Instruction – An Executive Summary*, the National Reading Panel (2000) indicated that computer technology is a classroom tool that can promote reading instruction. Since 2000, there have been several studies that were published indicating the usefulness of computer assisted instruction (CAI) and the effectiveness of reading instruction.

According to the National Reading Panel (2000), researchers identified 21 studies where computers were used to deliver reading instruction. Within the report, the National Reading Panel looked at multiple factors including the effectiveness of adding speech to computer presented text, the effects of vocabulary instruction, word recognition instruction, spelling, and the ability to help students learn how to read. The National Reading Panel indicated that all of the studies provided positive results.

Although there is limited research about the overall effectiveness on student achievement when using computer-assisted technology, the National Reading Panel

suggested that computers can provide motivation for students to engage in reading instruction. This is due to the fact that speech recognition software, multimedia presentations, and hypertext can create a meaningful learning environment. Furthermore, the National Reading Panel indicated that, even if computer programs do not become stand-alone programs for reading instruction, they may begin to serve as assistive technologies that compliment traditional programs. This is supported by a study published by the Center for Applied Research in Educational Technology. According to the study (National Reading Panel, 2006), the overall effect size for the use of CAI with early readers was 0.19. It was a little higher for students learning English. Researchers attributed this to the fact that pupils are addressing academic needs to learn spelling and letter-sound relationships.

Hall, Hughes, and Filbert (2000) identified the benefits and limitations of CAI. They noted that students had the most gains in reading when the computer software incorporated elements of a traditional reading program. When used properly, CAI assisted students in more than simply providing additional workbooks and teaching.

A summary was compiled involving 59 separate CAI studies (Cotton, 1991). According to the research, CAI enabled students to learn vocabulary and reading skills faster. This is due, in part, to the fact that CAI provides engaging activities and provides immediate, positive feedback. The benefits were more pronounced with lower-achieving students and those with learning disabilities.

Larson (2007) analyzed whether CAI is perceived as helpful by the student. According to the research, which was conducted with elementary students, it was determined that CAI is perceived to assist with increasing the phonemic awareness skills

for students below grade level, at grade level, and above grade level. I concluded that the perception was favorable, in part, because the software was easy to navigate, thereby giving the student a sense of engagement and ownership of the learning. Furthermore, Larson concluded that students identified that the software allowed the teacher to navigate around the room and give prescriptive assistance to students who were struggling.

Several researchers have measured the effectiveness of CAI on literacy achievement. Depending on the type of CAI used, the results were mixed. In a study conducted by Rehmann (2005) which measured the effectiveness of Earobics software on student acquisition of phonological awareness, it was determined that there was not a significant difference between the control groups and the experimental group in gain scores. Both groups increased as a result of direct instruction or CAI.

In a study conducted by Rings (1994), I identified three elements of CAI that assisted with the development of reading. Rings stated that, “critical components are a high level of interactivity, the encouragement of using strategies that have been proven to be effective for critical reading, and reading in a real context” (Larson, 2007, p. 148). This study was conducted with the Imagination Station software.

Soe, Koki, and Chang (2000) analyzed 17 studies from 1982-1997 on the effectiveness of CAI and reading achievement for students in Grades K-12. According to the authors, CAI had a positive effect. Kluger and DeNisi (1996) also stated that CAI proved beneficial with students in reading. Their research attributed the improvement to the learner’s increased motivation due to the software’s regular feedback.

Until recently, few computer programs had the capacity to provide a complete reading program. Elements of an effective reading program include addressing phonemic awareness, phonics, fluency, vocabulary, and comprehension (LearningPT.org) Although computer programs have the ability to address each of these raw elements within the software package, it is important to construct a system that provides systemic and explicit instruction (LearningPT, p.2). The challenge with software is providing artificial intelligence that adapts to the unique needs and skills of students. When addressing and measuring the reading ability of students, many computer programs have a limited ability to effectively and accurately measure a student's oral reading ability. This deficiency is due to a person's speech inflection, individual voice characteristics, and the continuous evolution of the new technology. In addition to difficulty in comprehending the user's speech, computer technology has difficulty evaluating open-ended comprehension responses. Previously, most software packages could only assess multiple-choice questions. As a result of these limitations, many reading experts once argued that computer software should serve as a supplemental tool that could, at best, enrich traditional reading instruction (National Reading Panel, 2000).

One current technology that is being piloted to measure the reading fluency of students is FLORA: Fluent Oral Reading of Children's Speech (Bolanos, Cole, Ward, Borts, & Svirsky, 2011). FLORA is an online assessment system that can be used on any MAC or PC. In order to calculate a student's reading level, a pupil has to read presented text into the computer via a microphone. The proctor will identify a student's age and gender. Then, the software will compute the number of words that a student accurately reads within 1 minute, based on the given text. Balanos et al. (2011) compared the

accuracy of the FLORA system and human scoring. In a study that included 783 elementary students, researchers determined that the FLORA system and human scores differ by only three to four words. Researchers stated that these results were significant. Based on the study, FLORA can be considered as a valid and reliable instrument to screen students for reading difficulties.

### **READ 180 Research**

Although 15,000 classrooms throughout the United States use the READ 180 literacy program, the amount of research demonstrating its ability to increase student achievement is limited (Shawgo, 2005). Scholastic conducted and published most of the research studies that are readily available. One of the first reports released by Scholastic (2009a) focuses on a study conducted in Orange County, Florida. Within this study, 63 students in Grades 6-8 who struggled in reading, participated in the READ 180 program. The study compared the growth of these students, identified as the Peabody Literacy Lab group, to another similar group of students who received traditional instruction. The researchers conducted separate Analysis of Variance tests for each subtest. According to data released by Scholastic, “on three out of the four subtests, the trend line of the Peabody Literacy Lab group ascends from pretest to post test and intersects the trend line of the contrast group” (Hasselbring & Goin, 2004, p. 18). Furthermore, Scholastic (2009a) boasted that the program has been able to increase student achievement on standardized tests, the dropout rate, improve literacy achievement for minority, special education, and ELLs, and increase teacher retention within 37 studies.

Scholastic (2011) conducted a study in the Austin, Texas Independent School District. The study compared the performance of 307 seventh and eighth-grade ELLs and

special education students that used the READ 180 program to a similar group of students that did not use the program. Details of the study indicate that only 2.6% of the students in the experimental group scored at the minimum level of proficiency on the Texas Assessment of Knowledge and Skills exam compared to 8.5% of the members in the control group. After 1 year of using the READ 180 program in a 90-minute implementation model, 24.1% of the experimental group met the minimum level of proficiency on the Texas Assessment of Knowledge and Skills exam compared with 23.8% of the members in the control group. Scholastic did not provide specific language levels of the ELLs. In addition, the researchers did not provide details about the scoring performance of the combined population.

Scholastic (2011) also conducted a study in the Desert Sands Unified School District in California. This study compared the performance of 285 sixth, seventh, and ninth grade ELLs that used the READ 180 program to a similar group of students that did not use the program. Students selected to participate in the study scored at Basic or Below Basic on the California Standards Test of English Language Arts. Details of the study indicate that the students in the experimental group earned a pretest score of 279. The posttest score average was 294. The report indicated that this is a statistically significant gain. Members of the control group earned a pretest average of 277 and a posttest score of 280. An ANCOVA test illustrates that the READ 180 students scored statistically higher than the control group.

Scholastic (2011) conducted a study in the Holyoke Public School District in Massachusetts. The study consisted of two groups. Members of the first cohort group used the READ 180 program for 2 years, but the second cohort group used the READ



180 program for only 1 year. The groups consisted of ELLs, special education students, and individuals from low socioeconomic households. The researchers measured the performance of 244 sixth, seventh, and eighth-grade students on the Massachusetts Comprehensive Assessment System and the Scholastic Reading Inventory. The study found the number of students in the first cohort who scored proficient on the Massachusetts Comprehensive Assessment System English Language Arts assessment increased from 2% to 19%. Furthermore, the students gained a statistically significant increase of 147 Lexiles on the SRI. In the second cohort, the number of students who scored proficient on the Massachusetts Comprehensive Assessment System also increased. Specifically, the number of students increased from 10% to 26%. Furthermore, members of the second cohort group gained an average increase of 125 Lexiles on the Scholastic Reading Inventory. Despite these gains, 81% of students in the first cohort group and 74% of students in the second cohort group did not score proficient on the Massachusetts Comprehensive Assessment System English Language Arts assessment.

Similar to the studies conducted in California, Texas, and Massachusetts, Scholastic (2011) conducted a large study in the Los Angeles Unified School District. This study, conducted in 2001, compared the performance of 531 eighth-grade students that participated in the READ 180 program to the performance of 537 similarly matched students that did not participate. Each group consisted of ELLs that scored poorly the year before on the Stanford Achievement Test, Ninth Edition and received either a D or F in English. Members of the experimental group participated in READ 180 under the 90-minute model. According to Scholastic, results of the study demonstrate that students participating in the READ 180 program averaged a statistically significant gain on the

Stanford Achievement Test, Ninth Edition in the Reading and Language subtests.

Conversely, students that did not participate in the program experienced lower performance. Overall, students using the READ 180 scored significantly higher than the control group.

In addition to conducting research with students at the middle grades levels, Scholastic (2011) has also analyzed the performance of secondary level students. The goal was to determine whether the READ 180 program would help students graduate from high school and thereby prepare them for college. In one study, conducted in the Clark County School District in Nevada, researchers analyzed the performance of 2,226 students that used the READ 180 program while in the eighth and ninth grades. The study compared the dropout rates of these students, at two different high schools, to the overall average of the district. At Cimarron-Memorial High School, one that used the READ 180 program, only 5.1% of students dropped out of school during the 2005 school year compared to the district average of 6.8%. In 2004, the same school averaged a dropout rate of 7.9% compared to the district average of 7.6%. In 2006, Scholastic compared the dropout rate of another high school to the district average. At Centennial High School, another READ 180 institution, the dropout rate was 3.7% compared to the district average of 5.9%. In 2005, Centennial High School experienced an 8.3% dropout rate. Although Scholastic indicates that the dropout rate decreased at each of the READ 180 schools, it is evident that the overall dropout rate in the district has decreased as well. It is unclear if the district is employing any other initiatives that may help lead to the higher graduation rate.

The Scholastic Research Team (2011) conducted a study that involved 1,483 9th and 10th-grade students in the Seminole County Public School District in Florida. Students that participated in the study came from a wide background of socioeconomic conditions, ethnicities, and learning abilities. The study compared the results of the Florida Comprehensive Assessment Test for members of the experimental and control groups. Overall, members that participated in the READ 180 program demonstrated greater gains on the Florida Comprehensive Assessment Test than the state average, the projected growth, and that of the control group. Specifically, the experimental group increased 105 points on the Florida Comprehensive Assessment Test compared to only 70 points for the control group. The expected growth on the Florida Comprehensive Assessment Test was 77 points. The state average was 66 points. Scholastic indicated that the growth observed by the experimental group was statistically significant.

Scholastic (2011) also provided research results of students ages 16-24 in the Job Corps program in California. In this study, 107 individuals used the READ 180 program for either *4 to 8 weeks* or *9 weeks or greater*. All students were administered the Test of Adult Basic Education as a pretest and a posttest. Results demonstrate that students that used the READ 180 for 4 to 8 weeks earned a mean increase of 82.3 points. Participants that used the READ 180 program for 9 weeks or more observed a mean increase of 115.1 points. According to Scholastic, Results revealed that the more time students spent in using the program, the higher the assessment scores.

Scholastic (2011) conducted another study with students attending Phoenix Community College in Arizona. This study observed 55 students. Of the participants, 27 students used the READ 180 program for 120 minutes, 4 days a week. The study also

included 28 students enrolled in a traditional reading program. Students in each group completed the College Preparatory Reading Test as a pretest and a posttest. The study also examined the number of students that remained enrolled in the community college at the end of the academic year and whether or not the program was satisfactory. Results from the study demonstrated that participants enrolled in the READ 180 program earned an average of 6.3 points on the College Preparatory Reading Test compared with only one point for the control group. This is a statistically significant increase. Furthermore, the study demonstrates that approximately 70% of the participants enrolled in the READ 180 program, compared with only 50% of students in the control group, remained enrolled in college at the end of the academic year. Finally, nearly 80% of students indicated that the READ 180 program enabled them to read faster and to increase comprehension. Approximately 93% of READ 180 participants believed that the program would help them in other college courses. Scholastic did not report the findings of the control group.

Despite conclusions from Scholastic, there is a substantial body of literature from independent researchers that suggests that READ 180 is able to do little, if anything, to increase the literacy achievement of students. Feldman (2008) analyzed Ohio Achievement Test reading scores for 56 African-American eighth-grade students in a single middle school. The school used the READ 180 program during the 2005-2006 school year. Feldman compiled and analyzed achievement data from the 2005, 2006, and 2007 school years. According to the regression study, there was a significant increase in student achievement between the 2005 and 2006 school years. During this time, student achievement increased 19 points from one year to the next. However, during the 2007

school year, the achievement scores of the students decreased 10 points from the previous year. Consequently, Feldman noted that the scores achieved from the program could not be maintained over an extended period.

The What Works Clearinghouse (2009), an independent organization associated with the United States Department Institute of Educational Sciences, reviews programs and determines the level of efficacy. According to their website, the What Works Clearinghouse analyzed 101 studies involving READ 180. According to the What Works Clearinghouse website, only seven READ 180 studies met standards, with reservations. Furthermore, “No studies of *READ 180* that fall within the scope of the Adolescent Literacy (AL) review protocol meet What Works Clearinghouse evidence standards, but seven studies met WWC evidence standards with reservations” (para. 2). The What Works Clearinghouse indicated that READ 180 may have a potentially positive effect on comprehension and general literacy when used with adolescent learners.

The What Works Clearinghouse (2009) provided reasoning why many of the studies conducted by Scholastic or its affiliates did not meet their evidence standards. These reasons included that the researcher may not have used a comparison group, the comparisons did not use an equivalent baseline, an effect of specific interventions was not examined, multiple interventions were used without the individual effects being determined, or the study did not provide enough information to determine if the outcome is valid or reliable. Furthermore, there were many other studies conducted by Scholastic where the details and the results have not been made public. In addition to the What Works Clearinghouse, several other independent studies measuring the effectiveness of the READ 180 program have been conducted. The results have been mixed. Within a

study conducted with 1,652 struggling readers in the ninth-grade students in Phoenix, Arizona, the researchers determined that the READ 180 program had an effect size of 0.12 when measuring achievement on the Stanford Achievement Test, Ninth Edition examination. An effect size of 0.32 was measured for ELLs on the same examination (White, Haslam, & Hewes, 2006).

Within a study conducted with 1,073 low-performing eighth grade students in Los Angeles, the READ 180 program was found to have a significant effect on student reading levels as measured by the Stanford Achievement Test, Ninth Edition (Papalewis, 2004). An effect size of 0.68 was measured. Students in the experimental and control groups were well matched in terms of reading levels and language proficiency.

A study was conducted in Little Rock, Arkansas with approximately 1,000 African-American students in Grades 6-9. Students in the control group and the experimental group were similarly matched in the demographics. When measuring reading achievement on the Iowa Test of Basic Skills, an effect size of -0.17 was calculated. Furthermore, on the Arkansas Benchmark exam, an effect size of -0.07 was measured (Mims, Lowther, Strahl, & Nunnery, 2006).

In a study conducted with 614 low-performing students in Grades 6-8 within the Austin, Texas school district, the effectiveness of the READ 180 program was measured by growth on the Texas Assessment of Knowledge and Skills exam. Students within the experimental and the control groups were similarly matched. Researchers determined that the effect size of the READ 180 program was 0.18 (Haslam, White, & Klinge, 2006), a low positive correlation that does not substantiate Scholastics' claims.

## **Competing Literacy Programs**

As computer technology continues to evolve at an exponential pace, researchers and publishing companies are beginning to realize the value in CAI programs similar to READ 180. New products combine traditional instruction with a computer program that underscores differentiated practice, embedded assessment, and specific, targeted instruction. These programs are touted as a method of effective intervention that can help students to perform at grade level. One program, Lexia, touts many of the same features as READ 180. These features include a program that emphasizes phonological awareness, alphabets, vocabulary, fluency, and reading comprehension. Lexia constructs the computerized program in a fashion that meets the individual needs of each student by providing a simple pretest. As a benefit to the teacher and parent, Lexia allows adults to obtain detailed reports that illustrate student growth, weaknesses, and performance predictors. Lexia's promotional literature features independent research to verify the program's effectiveness. Specifically, Lexia claims that it is one of only ten programs to meet effectiveness standards as determined by the What Works Clearinghouse. According to the What Works Clearinghouse, Lexia has an overall effect size of 0.27 in alphabets, 0.22 in fluency, and 0.27 in reading comprehension, as well as 1.12 in assisting students with alphabets. All studies were conducted with students in an elementary school setting (What Works Clearinghouse, 2009). No qualifying studies were found to support Lexia's contribution to older students.

Another program, Voyager Passport/Dibles Next, is a hybrid model that serves students in kindergarten through fifth grade. Components of the program are modeled after Reading First research, which underscores the five essential components of reading.

These components include phonemic awareness, phonics, fluency, vocabulary and comprehension. According to Cambium Learning Group, publisher of the program, Voyager Passport / Dibles Next can help students read on grade level. This is due to the fact that the program can determine the student's current reading level and design a prescriptive curriculum that can meet the pupil's needs. Furthermore, the program uses activities that are designed to engage students and allows teachers and parents to monitor progress through frequent assessment. One study was conducted to measure the effectiveness of Voyager Passport. Within the Miami, Florida school district, 847 Hispanic ELS students were studied using the program. Based on reading growth measured by the Florida Comprehensive Assessment Test-Grade 9 and Florida Comprehensive Assessment Test-Grade 10, Voyager Passport/Dibles measured an effect size of 0.22 and 0.12 on the respective exams (Shneyderman, 2006).

*Books That Grow* (2015) is an electronic reading program that provides flexibility for parents and educators. The Books That Grow program can be accessed via any tablet or computer. This enables students to read the text while at school and off campus. According to the publisher's website, one of the benefits of their program is that the software will provide the same book or literary title on multiple Lexile levels. Therefore, as students increase vocabulary and their ability to read, the text will be reintroduced at more complex levels. Parents, educators, and students can measure reading growth via electronic reports. According to the publisher, Books That Grow is useful for struggling learners and ELLs in Grades K-12. No independent, qualifying studies were found to support the effectiveness of Books That Grow.



Academy of Reading, published by School Specialty, is an online, interactive program that may be used with students in Grades 2-12. According to Fiedorowicz and Trites, authors of the program, the Academy of Reading is a reading intervention program that includes all of the components of a successful reading program. These include phonemic awareness, phonics, fluency, vocabulary and comprehension (Training and Education in the 21st Century, 2015). Furthermore, the authors stated the software can be used to create individualized learning plans based on the ability of each student. As a result of the lessons, parents and educators may access reports that measure progress. The authors claimed that the reading intervention program can be used 3 to 5 times per week for approximately 30 minutes (Training and Education in the 21st Century, 2015). According to the What Works Clearinghouse (2014), the Academy of Reading did not show a significant effect on student achievement.

Compass Learning provides a supplemental reading that is designed to assist middle and high school students. According to the publisher, the computerized software begins by giving each student a pretest. Based on the results of the assessments, individualized assignments are constructed and provided to the students. Students may work on the computerized assignments 15-30 minutes a day, 2 to 5 times per week. As a result of the assignments, students are expected to strengthen their reading skill gaps (Compass Learning, 2014).

Slavin, Cheung, Groff, and Lake (2008) conducted a study with middle and junior high school students in a rural, mostly Caucasian district in Texas. They found that Compass Learning had a moderate effect size on increasing reading achievement when measured by the Norm-Referenced Assessment Program for Texas. The study

demonstrated a weighted effect size of 0.15 between two schools. Specifically, at the junior high school, the effect size was 0.38 while at the middle school, the effect size was 0.07. At a study conducted within Georgia, the same Slavin et al. used students in Grades 6-8. In this study, the Compass Learning program demonstrated a stronger gain in student achievement. This study was conducted in a rural, high poverty district. Based on the findings of this study, the Compass Learning program had a 0.31 effect size.

Accelerated Reader, created by Renaissance Learning, is a computer-managed learning program that is touted by many schools throughout the nation. According to the publisher, Accelerated Reader provides the pupil with an initial computerized assessment. Then, based on the outcome of the assessment, the Accelerated Reader program compiles a set of titles for the pupil to read on the student's reading level. After a student reads the text, he or she will take a computerized assessment. Following the exam, teachers are provided a report that identifies the student's reading comprehension and vocabulary levels. Based on the information provided within the report, educators can provide interventions and measure student growth.

Multiple studies have been conducted to measure the effectiveness of the Accelerated Reader program. One of the largest studies was conducted in Mississippi within the 2002-2003 school year with over 3,200 students in Grades 6-8. Reading gains with the students were measured on the Mississippi Curriculum Test. According to Slavin et al. (2008), Accelerated Reader demonstrated an effect size of 0.11 for students in the sixth grade, 0.16 for students in the seventh grade, and 0.12 for students in the eighth grade. The overall effect size for the study was 0.13.

## **Participating School District ESL Model**

The participating school district in this study educates more ELLs than any other district in the state of Arkansas. Upon enrollment within the district, the family completes a questionnaire that determines whether or not a language other than English is spoken in the home. If the family confirms that a language other than English is spoken in the home, then the pupil is referred to the English as a Second Language Center. While at the ESL Center, the child is given a diagnostic examination that measures the level of English proficiency. The examination contains reading, writing, listening, and speaking components. The test is administered at the appropriate grade level for the student based on transcripts and age.

If a student is determined to need ELL support services, a Language Proficiency Assessment Committee meets and determines the best, least-restrictive type of services that should be provided. Students who have lived in the United States for less than 1 year and who score at an ELL 1 Level, are referred to the New Arrival Center. Within this program, students travel in a small cohort and are provided sheltered instruction. Classes are often double-blocked to promote more intense instruction.

Students who have resided in the United States for more than 1 year may be placed in a traditional school either in a mainstream class or in a sheltered class. Generally, students scoring at an ELL Level 1 or ELL Level 2 will be placed in sheltered core classes. Students scoring at an ELL Level 3 or higher will usually be placed in a traditional classroom but provided accommodations. These accommodations may range from extended time, use of a word-to-word dictionary, assignment to small groups, and provision of oral support on assignments and examinations. All of the accommodations

will be determined by the LPAC committee which is comprised of the student's teacher, an ELL specialist, a counselor, and an administrator. This committee reviews the progress of the pupil throughout the school year.

### **Conclusion**

It is imperative to meet the needs of ELLs. Their linguistic and possible academic deficiencies require the full focus of educators. Administrators at the district and the building level determine the strategies and resources that are provided to teachers. These resources include the use of a variety of ELL teaching strategies, curriculum design, and technology. Existing research illustrating the use of READ 180 in the classroom shows mixed results. Research provided by Scholastic concludes that READ 180 is an effective tool. Independent studies, however, demonstrate that READ 180 may not have a significant impact on student achievement.

## **CHAPTER III**

### **METHODOLOGY**

ELLs face multiple difficulties while attending school. These include limitations in their use of the English language and the challenge of learning new, complex academic content. Under the No Child Left Behind Act (United States DOE, 2003a), all schools must ensure the mathematics and literacy proficiency levels for students regardless of ethnicity, socioeconomic level, or level of disability. The failure of a school to reach proficiency goals can result in a loss of autonomy, reorganization of leadership, or additional sanctions.

This study examined the effects of the READ 180 program on the literacy and mathematics achievement of ELL in the seventh and eighth grades within a district in northwest Arkansas. This study was predicated on the null hypothesis: No significant effects of the READ 180 program and the number of years a student received ELL services in the United States will be observed on student achievement measured by literacy and mathematics tests (Arkansas Augmented Literacy and Benchmark Mathematics Examinations, respectively) for seventh and eighth graders who comprise the study population. The research hypotheses were as follows:

1. No significant effects of READ 180 intervention (participated or did not participate), ELL service length ( $6 < \text{ELL} \leq 6$  yrs), or year (2011 or 2012) will be observed on literacy achievement and on mathematics achievement as

measured by scaled scores on the AABE for seventh grade ELLs in a district in northwest Arkansas.

2. No significant effects of READ 180 intervention (participated or did not participate), ELL service length ( $6 < \text{ELL} \leq 6$  yrs), or year (2011 or 2012) will be observed on literacy achievement and on mathematics achievement as measured by scaled scores on the AABE for eighth grade ELLs in a district in northwest Arkansas.

The chapter is divided into six sections: research design, sample, instrumentation, data collection procedures, analytical methods, and limitations. This chapter will discuss the research design, selection and description of the sample population and how scores were obtained. Additionally, the chapter will cite the instrument used to measure student demographics, data collection, statistical analysis processes, and the limitations.

### **Research Design**

This causal-comparative design used seventh and eighth grade students in three urban middle schools and three junior high schools in northwest Arkansas. A causal-comparative research design was used because the READ 180 program was already implemented within the schools. ELLs were enrolled in the READ 180 class to promote literacy proficiency. The three independent variables for the first hypothesis were (a) whether or not the student used the READ 180 program, (b) the number of years the student received ELL services in the United States (6 years or less or more than 6 years), and (c) the tested year (2011 or 2012). The dependent variables for the first hypothesis were literacy and mathematics achievement measured by scaled scores obtained on the seventh grade Arkansas Augmented Benchmark Literacy Examination. The three

independent variables for the second hypothesis were (a) whether or not the student used the READ 180 program, (b) the number of years the student received ELL services in the United States (6 years or less or more than 6 years), and (c) the tested year (2011 or 2012). The dependent variables for the second hypothesis were literacy and mathematics achievement measured by scaled scores obtained on the eighth grade Arkansas Augmented Benchmark Mathematics Examination. The design used for the evaluation of all the hypotheses was a non-randomized design.

### **Sample**

The six schools were chosen based on their similar student demographics of grade configuration, ethnicity, and the implementation of the READ 180 program. READ 180 classes generally consisted of 10-15 students. The study included a total of 743 students in seventh grade and 649 students in the eighth grade. Finally, 248 of the students in each school who were participating in the READ 180 program were compared to another 1,144 students who were not participating in the READ 180 program. Students were identified for the READ 180 program based on their ELL level. Within the group of students participating in the READ 180 program, I identified the number of years the students received ELL services. Students were identified as having received ELL services of 6 years or less or more than 6 years. Non-ELL and those at the ELL Level 3 or higher were not eligible to participate in the READ 180 program.

### **Instrumentation**

Two instruments were used in the study. The instruments for both hypotheses were the Arkansas Augmented Benchmark Literacy and Mathematics tests. Within the first hypothesis, I used the seventh grade Literacy and Mathematics scaled scores. The

second hypothesis used the eighth grade Literacy and Mathematics scaled scores. Students at all six schools were required to take the AABE. The AABE consists of a set of individually administered criterion-referenced reading and mathematics assessments. The AABE exam for the seventh grade differs from the eighth grade examination. The AABE is administered by certified teachers at each school. The examination is scored by Questar, a private company contracted by the Arkansas DOE (2010b).

AABE scaled scores on the seventh grade examinations in 2011 ranged from 24 to 987 in literacy and 174 to 999 in mathematics. Furthermore, the AABE scaled scores on the eighth grade examinations ranged from 29 to 990 in literacy and 200 to 999 in mathematics. AABE scaled scores on the seventh grade examinations in 2012 ranged from 28 to 991 in literacy and 173 to 996 in mathematics. In addition, the AABE scaled scores on the eighth grade examinations ranged from 28 to 990 in literacy and 208 to 999 in mathematics. All data were provided electronically to the school district. Demographic and standardized assessment data reported on the AABE identified a student's ethnicity, grade level, scaled score, and lunch status. For this study, I collected information pertaining to each student's participation in the READ 180 program and the number of years he or she received ELL services. This information was compiled from the Arkansas Public School Consolidation Network (APSCN) and the district's data dashboard system.

### **Data Collection Procedures**

Data collection for this study included only instruments that were already being used by the school. By using already established instruments, the data collection process was more efficient and less intrusive to the participants. Student performance scores on the AABE were provided to the school district electronically. Student names, student



identification numbers, identified student demographics as per the examination, and student scaled scores were included within the electronic resources.

Whether a student was identified as an ELL was originally maintained within the APSCN. Additionally, course enrollment records were maintained within APSCN. In order to assist teachers and administrators, the school district maintained a comprehensive electronic data base system, entitled Data Dashboard, which compiled all student testing records and APSCN information. For the purposes of this study, I accessed the Data Dashboard information via the district's technology administrator. A request for the information required was provided in writing by me. The data released from the district technology administrator did not contain any student names or other identifiable information. Rather, the technology administrator provided the student identification number, the school enrolled, the current grade level, the year the pupil began receiving ELL services, the literacy scaled score, the mathematics scaled score, and whether or not the pupil was enrolled in READ 180.

Once provided by the district technology administrator, the data were kept secure on two jump drives. The jump drives were locked and secured when not in use. Data will be kept secure for 3 years after the completion of the research project. At the conclusion of the 3 years, the data and the jump drives and any paper documentation were destroyed.

### **Analytical Methods**

To address both hypotheses, a factorial MANOVA was conducted using whether the student participated in the READ 180 program, the number of years the student received ELL services ( $6 < \text{ELL} \leq 6$  yrs), and the tested year (2011 or 2012) as independent variables. In the first hypothesis, I used the independent variables to evaluate

the literacy and mathematics achievement measured by overall scaled scores on the seventh grade Arkansas Augmented Benchmark Literacy examination. The overall, scaled scores in literacy and mathematics served as the dependent variables in this hypothesis. In the second hypothesis, I used the independent variables to evaluate the literacy and mathematics achievement measured by overall scaled scores on the eighth grade Arkansas Augmented Benchmark Literacy examination. The overall scaled score in literacy and mathematics served as the dependent variable in this hypothesis.

### **Limitations**

A weakness that naturally occurs in conducting a causal-comparative study is that the researcher has little or no control over the intervention, as it has already occurred. Furthermore, the groups were preexisting. I did not control whether or not the pupil participated in the READ 180 program or when the pupil began receiving ELL services. Despite these limitations, a causal-comparative study was chosen because the grouping cannot be manipulated by the researcher.

A second limitation of the study was the effort provided by pupils on the AABE. Effort and attendance on the test dates will contribute to the scaled score earned by the student.

A third limitation of the study was the level of training provided to each READ 180 teacher. Although all teachers received some level of training in order to administer the READ 180 program, the consistency or level of training cannot be determined. Variability in teacher consistency or level of training could impact the level of fidelity with which the READ 180 program was delivered.

## **CHAPTER IV**

### **RESULTS**

This study examined the effects of ELL service length (less than or equal to 6 years or greater than 6 years), 180 intervention (participated or did not participate), and year of testing (2011 or 2012) on literacy and mathematics achievement measured by the AABE for seventh and eighth grade ELLs in a school district in Northwest Arkansas. The scaled scores of the participants were used in the analysis. Two factorial MANOVAs with the three factors and the two dependent variables were conducted. The analysis method of factorial MANOVA was chosen for this study because it was expected that there could be an interplay of the independent factors on test scores. Further, it was anticipated that the mathematics and literacy test scores of an individual student would have some relationship. Finally, factorial MANOVA was reportedly robust enough to reliably analyze large sample sizes that do not deviate wildly from a normal distribution (Pallant, 2007). Seventh and eighth grades were analyzed separately. Although items may be added or removed each year, the content that is tested is based on state standards, which do not change dramatically from year to year. When significance was indicated by multivariate tests, F tests to determine the source of significance were conducted. The effect size was also calculated. Care was taken to review the characteristics of each dataset to identify violations of underlying assumptions including normality of distribution and homogeneity of variance. This chapter will explore the preanalysis of the

data and examine each hypothesis for a 3-way interaction effect, three 2-way interaction effects, and three main effects.

### **Data Preanalysis**

The data were checked for missing data and outliers, using the SPSS Explore capabilities. Scaled scores less than 250 were excluded from the study. Fourteen scores in 2011 (seven scores of zero, and seven scores less than 250) and seven scores in 2012 (one score of zero, and six scores of less than 250) were omitted. Although no data were available to prove so, anecdotal information from experienced English teachers suggested that scores below 200 were not reliable either because some students did not give their best efforts or some students had insufficient English knowledge to actually take the test. Further, data points below 250 were designated outliers in the exploratory data analysis. Other data points, which might best be categorized as extreme, were greater than or equal to 1.5 box plot lengths from the edge of the box (a method of distinguishing extreme data points from outliers) and so were retained for analysis. Finally, scaled scores were chosen as the dependent variables (as opposed to raw scores) because, when schools are penalized for underperformance, the sanctions are based on scaled scores.

The data were analyzed for normality of distribution. The Kolmogorov-Smirnov (K-S) test, which is a goodness-of-fit test and compares the dataset against the normal distribution, is less powerful than Shapiro-Wilks (S-W) test, meaning that the null hypothesis is correctly rejected less often (Morgan, Leech, & Barrett, 2011). Both tests were shown because recommendations for their use vary, with some sources recommending that S-W be used with populations of less than 50 or with small sample sizes and because some groups were small by comparison (seventh or eighth grade

students in READ 180,  $n = 99$  and  $n = 149$ , respectively). Recommendations for using K-S also varied (Wolverton, n.d.). Because the datasets were large, the Central Limit Theorem served to mitigate the violations of normality for distribution and variance. In addition to statistical significance, the effect size was also reported (partial eta squared) to illuminate the degree to which the observed results might actually be the result of a given factor.

Seventh grade literacy scores from 2011 were normally distributed based on the K-S Test and on the S-W test, in contrast to the 2012 scores. Seventh grade mathematics scores were normally distributed for both the 2011 and 2012 scores. Although eighth grade mathematics scores were normally distributed for 2011, neither the 2012 mathematics scores (significant for K-S, only) nor literacy scores for both years were. Mathematics scaled scores may have been most affected by the larger sample in 2012 ( $n = 334$  versus  $n = 409$ , for 2011 and 2012, respectively) and by the smaller standard deviation observed in the 2012 sample ( $\sigma_{\bar{x}} = 75.80$  versus  $\sigma_{\bar{x}} = 64.70$ , for 2011 and 2012, respectively).

Homogeneity of variance was tested with Levene's Test of Equality of Error Variances. Although the homogeneity of variance assumption was supported by the literacy scores, this was not the case for overall mathematics scores. The variance was greater in 2011 compared to 2012 (5,744.70 versus 4,190.90, respectively).

Skewness and kurtosis were calculated for seventh and eighth grade literacy and mathematics scores by year. Seventh grade literacy scores exhibited a skewness of -0.19 ( $SE = 0.13$ ) and -0.64 ( $SE = 0.12$ ) and a kurtosis of -0.11 ( $SE = 0.27$ ) and -0.12 ( $SE = 0.24$ ), for 2011 and 2012, respectively.

Seventh grade mathematics scores exhibited greater skewness in 2012 compared to 2011 (0.06;  $SE = 0.13$  versus -0.16;  $SE = 0.12$ , for 2011 and 2012, respectively). Kurtosis decreased in 2012 (0.29;  $SE = 0.27$  versus 0.12;  $SE = 0.24$ , for 2011 and 2012, respectively). Negative skewness in this specific instance was indicative of data with more scores above the mean than below. Skewness was more evident in the seventh grade scaled score means for literacy than for mathematics and scores from 2012 compared to 2011. Kurtosis of the 2011 overall mathematics scores was evident and suggested that scaled scores clustered more tightly around the mean than in 2012.

Eighth grade literacy scores were positively skewed for both years (-0.71;  $SE = 0.14$  and -0.54;  $SE = 0.13$ , for 2011 and 2012, respectively). Kurtotic characteristics changed substantially between 2011 and 2012 (0.61;  $SE = 0.28$  versus -0.10;  $SE = 0.26$ , for 2011 and 2012, respectively, and a kurtosis of -0.11 ( $SE = 0.27$ ) and -0.12 ( $SE = 0.24$ ) in 2011 and 2012, respectively).

Eighth grade mathematics scores exhibited nearly opposite skews from 2011 to 2012 (0.24;  $SE = 0.14$  versus -0.23;  $SE = 0.13$ , for 2011 and 2012, respectively). In comparison, kurtosis in 2011 was -0.10;  $SE = 0.28$ . Kurtosis of the 2011 overall mathematics scores was evident and suggested that scaled scores clustered more tightly around the mean than in 2012.

### **Hypothesis 1**

Hypothesis 1 stated that there would be no significant effects of READ 180 intervention (participated or did not participate), ELL service length ( $6 < ELL \leq 6$  yrs), or year (2011 or 2012) on literacy achievement and on mathematics achievement as measured by scaled scores on the AABE for seventh grade ELLs in a district in northwest

Arkansas. A factorial MANOVA (Type III sum of squares used to account for uneven group sizes) was conducted, and data were not normally distributed for scaled literacy or mathematics scores when parsed by READ 180 intervention for seventh grade although homogeneity of variance is not significant. When parsed by ELL service length, both assumptions of normality and homogeneity of variance were violated for seventh grade scaled literacy and mathematics scores. Descriptive statistics were illustrated in histograms, stem and leaf plots for both ELL by the length of service and READ 180 intervention (participated or did not participate), and Q-Q plots. Irregularities in these visuals were inspected for influence on the analysis.

Pillai's Trace, Wilks' Lambda, Hotelling's Trace and Roy's Largest Root are all multivariate statistics that test between-group significance, but they differ in the way dependent variables are combined to determine the variance. Although Pillai's Trace is the most robust against unequal sample sizes and offers the greatest protection against Type I errors, the most commonly used statistic is Wilks' Lambda ( $\Lambda$ ), because it is probably the most readily understandable (Stevens, 2002). Subtracting Wilks' lambda from 1 provides a measure of the amount of variance in the dependent variables accounted for by the independent variables. A small value would indicate a large difference between the groups being analyzed. Table 1 includes the multivariate analysis results for the three independent factors—ELL service length, participation in the READ 180 intervention, and testing year were all significant. There were no confounding two-way or three-way interactions among the three factors ( $p \leq .22$ ).

Table 1

*Seventh Grade Multivariate Analysis (Wilks' Lambda)*

Effect	Value	F	df	Error df	Sig.
Year	.965	13.30	2	734	0.00
READ 180 <sup>a</sup>	.963	13.97	2	734	0.00
ELL Length	.984	6.07	2	734	0.00
Year * READ 180	.999	0.53	2	734	0.59
Year * ELL Length	.996	1.51	2	734	0.22
READ 180 * ELL Length	.998	0.82	2	734	0.44
Year * READ 180 * ELL Length	.997	1.03	2	734	0.36

<sup>a</sup>Indicates participation in the READ 180 program

The between-subjects analysis illustrates there was not a statistically significant interaction between length of time receiving ELL services, participation in the READ 180 program [ $F(1, 735) = .039, p = .843$ ], and year tested. Furthermore, there was not a statistically significant interaction between the length of ELL service time and the participation in the READ 180 program [ $F(1, 735) = .323, p = .570$ ]. Main effects are significant with ELL service length, participation in the READ 180 intervention, and testing year, each affecting literacy scores independently. The effect size, given by partial eta squared ( $\eta^2 * 100 = \% \text{ variance in the dependent variable attributable to a predictor/independent variable after excluding [partialing out] effects of other$



predictor/independent variables; Richardson, 2011) is quite small for each one of these factors (year, Read 180, and ELL services account for 1.6%, 3.6%, and 1.2% of observed variance, respectively). Whereas effects may appear non-significant in a small sample, effect size can uncover critical importance (Field, 2005). Conversely, large samples may generate statistical significance as in this analysis but the magnitude of the effects may be quite small. Table 2 shows the seventh grade literacy between subjects tests.

Table 2

*Seventh Grade Literacy Between Subjects Tests*

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P</i>	<i>ES</i>
Year	198934.6	1	198934.6	12.02	.001	0.02
READ 180 <sup>a</sup>	459910.5	1	459910.5	27.78	.000	0.04
Length of ELL Services	148822.4	1	148822.4	8.99	.003	0.01
Year * READ 180	3066.1	1	3066.1	0.19	.667	0.00
Year * Length of ELL Service	47283.5	1	47283.5	2.86	.091	0.00
READ 180 * Length of ELL Service	5352.2	1	5352.2	0.32	.570	0.00
Year * READ 180 * Length of ELL Service	646.9	1	646.9	0.04	.843	0.00

<sup>a</sup>Indicates participation in READ 180 program

A review of means in Table 3 illustrates that the mean scaled literacy score for students who did not participate in READ 180 was higher than the mean scaled score for students who did participate in the program. This result can be explained, in part, because

only students with significant language deficiencies were assigned to the READ 180 program.

Table 3  
*Overall Seventh Grade Literacy Mean Scores by Variable & Group*

Variable	Group	Mean Score
Year	2011	659.57
	2012	743.78
READ 180 Participation	Yes	605.02
	No	721.44
ELL Service Length	≤ 6 yrs.	628.74
	> 6 yrs.	722.61

The overall mean scaled score ( $\bar{x} = 628.7$ ) of students who received ELL services for 6 years or less was lower than that for students who received services for more than 6 years ( $\bar{x} = 722.6$ ). The highest scoring group of students was those who were not in READ 180 and who received ELL services for more than 6 years (most usually the students who have been in the United States the longest or who have been identified in elementary school as needing services), whereas the lowest performing group of students was students who were in READ 180 and who received services for less than 6 years (highly mobile students or students who have only recently moved into the United States recently). Table 4 includes the comparison of the seventh grade literacy mean scores by participation in READ 180, length of ELL service, and testing year.

Table 4

*Comparison of Seventh Grade Literacy Mean Scores by Participation in Read 180, Length of ELL Service, & Testing Year*

Year	Participation in READ 180			
	ELL $\leq$ 6 yrs.		ELL $>$ 6 yrs.	
	Yes	No	Yes	No
2011	576.28	648.68	591.46	675.88
2012	601.29	681.23	664.82	769.58
Overall	578.20	667.80	637.60	727.80

The seventh grade mean scaled literacy score was significantly higher in 2012 than in 2011 ( $\bar{x} = 743.78 \pm 7.10$  vs  $659.58 \pm 6.93$ ;  $p < 0.05$ ). Students who were not in the READ 180 program scored significantly higher than those who participated in the intervention ( $\bar{x} = 721.44 \pm 5.44$  vs  $605.02 \pm 12.42$ ;  $p < 0.05$ ). The number of students who participated in this program was small ( $n = 99$ ) compared to the number of students who were not placed in the program ( $n = 644$ ). Students who received ELL services for longer than 6 years ( $n = 611$ ) scored significantly higher than did their counterparts who had fewer years of services ( $n = 132$ ;  $\bar{x} = 722.61 \pm 5.40$  vs  $628.74 \pm 13.42$ ;  $p < 0.05$ ). The null hypothesis is rejected for the reason that significant differences in scaled literacy scores do exist based on participation in READ 180 and on length of ELL service. Participation in READ 180 is associated with lower scaled scores as is ELL service length of less than or equal to 6 years. The likely reasons that explain the differences will be discussed in Chapter 5.

## Mathematics

Although seventh grade mathematics scaled scores were normally distributed for 2011, the K-S goodness of fit test pointed to a violation in 2012 ( $p < .05$ ). Levene's statistic was significant ( $p < .05$ ), indicating that variance was not homogenous.

The Between Subjects tests illustrate that there was not a statistically significant interaction between length of time receiving ELL services, and the participation in the READ 180 program [ $F(1, 735) = 1.682, p = .195$ ], or year tested (2011 or 2012). Furthermore, there was not a statistically significant interaction between the length of ELL service time and the participation in the READ 180 program, [ $F(1, 735) = .423, p = .516$ ]. Results are illustrated in Table 5. Main effects are significant with ELL service length ( $6 < \text{ELL} \leq 6 \text{ yrs}$ ) and READ 180 intervention (participated or did not participate), each affecting mathematics scores independently. Although the main effects are significant, the effect sizes are very small. Only length of ELL service is greater than 1.0% (1.3%). The discrepancy in the level of significance compared to the small effects may be attributable in part to the discrepant sample sizes. Table 5 includes the seventh grade mathematics Between Subjects tests by testing year and participation in READ 180 and length of ELL service.

Table 5

*Seventh Grade Mathematics Between Subjects Tests of Testing Year, Participating in READ 180, & Length of ELL Service*

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	<i>ES</i>
Year	7715.5	1	7715.5	1.65	.199	0.00
READ 180 <sup>a</sup>	29840.3	1	29840.3	6.40	.012	0.01
Length of ELL Services	45872.7	1	45872.7	9.83	.002	0.01
Year * READ 180	1360.9	1	1360.9	0.29	.589	0.00
Year * Length of ELL Services	7430.3	1	7430.3	1.59	.207	0.00
In READ 180 * Length of ELL Services	1971.9	1	1971.9	0.42	.516	0.00
Year * In READ 180 * Length of ELL Services	7845.5	1	7845.5	1.68	.195	0.00

<sup>a</sup>Indicates participation in READ 180 program

A review of means, in Table 6, illustrates that the mean scaled score in mathematics for seventh grade students who received ELL services for greater than 6 years was significantly higher ( $p < .05$ ) than the mean scaled score for students with less than or equal to 6 years ( $698.80 \pm 6.02$  vs  $671.83 \pm 6.14$ ). Students who did not receive READ 180 intervention also scored significantly higher ( $p < .05$ ) than those who did ( $696.19 \pm 4.44$  vs  $674.44 \pm 7.36$ ). This phenomenon can be explained, in part, by the language and academic deficiencies that qualify the student for placement in additional services. When seventh grade data are parsed for READ 180 comparisons, the dataset is both normally distributed ( $p > .200$ , S-W) and homogenous with respect to variance ( $p > .09$ ; Levene statistic). Although the K-S test is significant, this result could be from a small  $n$  for the READ 180 (participated) group. In contrast, when parsed by the length of

ELL service, the above assumptions for normal distribution and variance are invalid.

Tests of normality, histograms, stem-and-leaf plots and Q-Q plots for ELL service length and READ 180 intervention were analyzed for concerns. Reasons for the observed outcomes are presented in chapter 5.

Table 6

*Overall Seventh Grade Mathematics Mean Scores by Variable & Group*

Variable	Group	Mean Score
Year	2011	690.85
	2012	679.79
READ 180 Participation	Yes	674.44
	No	696.19
ELL Service Length	≤ 6 yrs.	671.83
	> 6 yrs.	698.80

Table 7 includes a comparison of the seventh grade mathematics mean scores by participation in READ 180, length of ELL service, and testing year.

Table 7

*Comparison of Seventh Grade Mathematics Mean Scores by Participation in Read 180, Length of ELL Service, & Testing Year*

Year	Participation in READ 180			
	ELL $\leq$ 6 yrs.		ELL $>$ 6 yrs.	
	Yes	No	Yes	No
2011	661.22	704.36	694.08	703.73
2012	655.11	666.65	687.36	710.03
Overall	658.50	682.20	689.90	707.20

### **Hypothesis 2**

Hypothesis 2 stated that there would be no significant effects of participating in the READ 180 intervention, ELL service length ( $6 < \text{ELL} \leq 6$  yrs), or year (2011 or 2012) on literacy achievement and on mathematics achievement as measured by scaled scores on the AABE for eighth grade ELLs in a district in northwest Arkansas. Statistical analysis was the same as for the seventh grade dataset in Hypothesis 1. Outcomes for literacy and mathematics are discussed separately.

#### **Literacy**

Both K-S and S-W tests for normality indicated a violation for both years ( $p < .05$  for 2011 and 2012). The assumption of homogeneity of variance was, however, not violated ( $p < .13$ ). It is likely that because of the large dataset, the Central Limit Theorem can be relied on to mitigate non-normality. Tests of normality, histograms, stem-and-leaf plots and Q-Q plots for ELL service length and READ 180 intervention were analyzed.

Multivariate analysis results in Table 8 illustrates that all three factors—ELL service length, READ 180 intervention, and year—had significance ( $p < .05$ ). However, a statistically significant interaction was observed between ELL service length and READ 180 intervention ( $p < .05$ ). This discussion focuses on the numerical relationships between these two factors. The numerical means will be highlighted without any reference to statistical significance for two reasons: (a) to determine whether the results were similar to the trends seen in seventh grade, and (b) because if this study were to be extended, the new hypotheses would logically consider the outcomes of previous investigations.

Table 8

*Eighth Grade Multivariate Analysis (Wilks' Lambda)*

Effect	Value	F	df	Error df	Sig.
Year	.940	20.40	2	640	0.00
READ 180 <sup>a</sup>	.970	10.03	2	640	0.00
ELL Length	.946	18.09	2	640	0.00
Year * READ 180	.998	0.57	2	640	0.57
Year * ELL Length	.999	0.43	2	640	0.65
READ 180 * ELL Length	.980	6.56	2	640	0.00
Year * READ 180 * ELL Length	.995	1.56	2	640	0.21

<sup>a</sup>Indicates participation in the READ 180 program



Between-subjects analysis reveals that the significance is the result of an interaction between the length of time receiving ELL services and the participation in the READ 180 program on literacy scores [ $F(1, 641) = 11.460, p = .001$ ]. The null hypothesis is rejected. Table 9 details the between-subjects test of testing year for those who participated in the READ 180 program by years of ELL service.

Table 9

*Eighth Grade Literacy Between Subjects Tests of Testing Year, Participating in READ 180, & Length of ELL Service*

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	<i>ES</i>
Year	298792.9	1	298792.9	17.68	.000	0.03
READ 180 <sup>a</sup>	145209.4	1	145209.4	8.59	.003	0.01
Length of ELL Services	603606.3	1	603606.3	35.72	.000	0.05
Year * READ 180	10227.9	1	10227.9	0.61	.437	0.00
Year * Length of ELL Services	10576.3	1	10576.3	0.63	.429	0.00
READ 180 * Length of ELL Services	193673.9	1	193673.9	11.46	.001	0.02
Year * READ 180 * Length of ELL Services	42631.2	1	42631.2	2.52	.113	0.00

<sup>a</sup> Indicates participation in READ 180 program

The mean scaled score in literacy for eighth grade students who did not participate in READ 180 was higher than the mean scaled score for students who did participate in the program ( $\bar{x} = 726$  vs  $653$ , respectively). Mean scaled scores of students who received services for 6 years or less ( $\bar{x} = 620.2$ ) were dramatically lower than those

for students who received services for more than 6 years ( $\bar{x} = 731.9$ ). Table 10 includes the overall eighth grade literacy mean scores.

Table 10

*Overall Eighth Grade Literacy Mean Scores*

Variable	Group	Mean Score
Year	2011	688.63
	2012	726.88
READ 180 Participation	Yes	653.46
	No	725.96
ELL Service Length	$\leq 6$ yrs.	620.16
	$> 6$ yrs.	731.86

Further analysis of the means illustrates that the highest scoring group of students are those who were not in READ 180 and who received ELL services for more than 6 years. The observed interaction effect can be attributed to the much lower literacy scores in 2012 for students who received less than or equal to 6 years of ELL service and did not participate in READ 180 ( $n = 52$ ;  $\bar{x} = 631 \pm 179.61$ ) compared to those with the same length of ELL service and participation in READ 180 in 2012 ( $n = 27$ ;  $\bar{x} = 673 \pm 122.61$ ). In every other instance within this study, participation in READ 180 is associated with lower scores. Effect sizes are small (2.7%, 1.3%, and 5.3% for year, participation in READ 180, and ELL service length, respectively). Table 11 includes a comparison of eighth grade literacy mean scores by participation in Read 180 program, length of ELL service, and testing year.

Table 11

*Comparison of Eighth Grade Literacy Mean Scores by Participation in Read 180, Length of ELL Service, & Testing Year*

Year	Participation in READ 180			
	ELL $\leq$ 6 yrs.		ELL $>$ 6 yrs.	
	Yes	No	Yes	No
2011	565.14	593.13	637.91	718.53
2012	672.93	631.64	676.03	780.37
Overall	624.50	617.60	667.60	747.20

### **Mathematics**

Although the dataset was normally distributed for 2011, this assumption did not hold true for 2012. Homogeneity of variance approaches significance ( $p = .06$ ) but does not statistically violate this assumption. Tests of normality, histograms, stem-and-leaf plots and Q-Q plots for ELL service length and READ 180 intervention were analyzed.

Between-subjects analysis, displayed in Table 12, illustrates there was not a statistically significant interaction between length of time receiving ELL services, the participation in the READ 180 program [ $F(1, 641) = .070, p = .792$ ], and year tested. There was not a statistically significant interaction between ELL service length and the participation in the READ 180 program [ $F(1, 641) = .729, p = .393$ ]. Main effects are significant with ELL service length ( $6 < \text{ELL} \leq 6$  yrs), READ 180 intervention

(participated or did not participate), and year (2011 or 2012), each affecting mathematics scores independently. Effect sizes of the independent factors are small.

Table 12

*Eighth Grade Mathematics Between Subjects Tests of Testing Year, Participating in READ 180, & Length of ELL Service*

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	<i>ES</i>
Year	169342.5	1	169342.5	40.33	.000	0.06
READ 180 <sup>a</sup>	83307.1	1	83307.1	19.84	.000	0.03
Length of ELL Services	32696.9	1	32696.9	7.79	.005	0.01
Year * READ 180	4601.3	1	4601.3	1.10	.296	0.00
Year * Length of ELL Services	7.365	1	7.365	0.00	.967	0.00
READ 180 * Length of ELL Services	3062.340	1	3062.34	0.73	.393	0.00
Year * READ 180 * Length of ELL Services	292.235	1	292.235	0.07	.792	0.00

<sup>a</sup>Indicates participation in READ 180 program.

A review of means illustrates that the mean scaled score in mathematics for eighth grade students who do not participate in READ 180 ( $\bar{x} = 675.45$ ) is significantly higher than the mean scaled score for students who participate in the program ( $\bar{x} = 647.49$ ).

These data are presented in Table 13.

Table 13

*Overall Eighth Grade Mathematics Mean Scores*

Variable	Group	Mean Score
Year	2011	649.76
	2012	685.40
READ 180 Participation	Yes	647.49
	No	675.45
ELL Service Length	≤ 6 yrs.	647.97
	> 6 yrs.	674.36

Overall means scaled scores of students who received services for 6 years or less (mean average scaled score of 648) were significantly lower than the scaled scores of students who received services for more than 6 years (mean scaled score of 674.4). A further analysis of the means illustrates that the highest scoring group of students are those who were not in READ 180 and who received ELL services for more than 6 years. This is compared to the lowest performing group of students, (students who were in READ 180 and who received services for less than 6 years). The reasons for the observed data will be discussed in Chapter 5. Table 14 includes a comparison of eighth grade mathematics mean scores by participation in READ 180, length of ELL service, and testing year.

Table 14

*Comparison of Eighth Grade Mathematics Mean Scores by Participation in Read 180, Length of ELL Service, & Testing Year*

Year	Participation in READ 180			
	ELL $\leq$ 6 yrs.		ELL $>$ 6 yrs.	
	Yes	No	Yes	No
2011	599.23	635.07	615.59	660.05
2012	655.44	672.15	667.35	700.37
Overall	630.20	658.60	656.00	678.80

## CHAPTER V

### DISCUSSION

The ability to read is essential for the academic success of students (National Reading Panel, 2000). ELLs are faced with the special challenge of learning academic content and mastering the English language. As a result of this challenge, many universities and companies have developed and marketed programs to assist educators. Some of these programs use traditional strategies while others incorporate the use of technology. One of the curricula marketed to school administrators is the READ 180 program.

The READ 180 program was originally designed for use with students with learning disabilities. However, Scholastic (2009b), indicates that the program is an effective tool that can be used with all struggling readers, including ELL. A review of the literature demonstrates that READ 180 is deemed effective by Scholastic. Independent research demonstrates mixed findings regarding the effectiveness of the READ 180 program.

The purposes of this study were two-fold. First, the purpose of this study was to determine the effects of READ 180 intervention (participated or did not participate), ELL service length ( $6 < \text{ELL} \leq 6$  yrs), and year (2011, 2012) on literacy and mathematics achievement as measured by scaled scores obtained on the Arkansas Augmented Benchmark Literacy and Mathematics Examinations for seventh grade ELLs in a school district in northwest Arkansas. Second, the purpose of this study was to determine the

effects of READ 180 intervention (participated or did not participate), ELL service length ( $6 < \text{ELL} \leq 6$  yrs), and year (2011, 2012) on literacy and mathematics achievement as measured by scaled scores obtained on the Arkansas Augmented Benchmark Literacy and Mathematics Examinations for eighth grade ELLs in a school district in northwest Arkansas.

Participation in the READ 180 program was analyzed to gain more insight into the effects on children who were involved. As an educational administrator, I sought to determine whether or not the use of the READ 180 program with ELLs improved outcomes. This information can be beneficial to other districts in Arkansas. Individual scaled scores (AABE in literacy and mathematics) were examined to determine if differences existed between those who participated in READ 180 and those who did not participate.

The study analyzed AABE results in literacy and mathematics from 743 seventh graders and 649 eighth graders in six schools in a district in northwest Arkansas. AABE results were analyzed to find differences by participation in the READ 180 program or ELL service length by grade on the mathematics and literacy achievement of students.

In this chapter, conclusions, recommendations, and implications are presented. First, this chapter includes conclusions on the data collected and analyzed in this study. Second, recommendations based on the conclusions are included for school patrons involved in the study as well as those considering the implementation of the READ 180 program. Finally, the implications and significance of this study are discussed.



## **Conclusions**

To address both hypotheses, MANOVA was conducted using READ 180 intervention, the ELL service length, and year on the Arkansas Augmented Benchmark Literacy and Mathematics Examination scaled scores for seventh and eighth grade ELL. The following hypotheses were tested and the respective conclusions were formulated. I used a .05 level of significance. Interactions and main effects were examined in each of the hypotheses.

### **Hypothesis 1**

Hypothesis 1 stated that there would be no significant effects of READ 180 intervention (participated or did not participate), ELL service length ( $6 < \text{ELL} \leq 6$  yrs), or year (2011 or 2012) will be observed on literacy achievement and on mathematics achievement as measured by scaled scores on the AABE for seventh grade ELLs in a district in northwest Arkansas.

### **Hypothesis 2**

Hypothesis 2 stated that there would be no significant effects of READ 180 intervention (participated or did not participate), ELL service length ( $6 < \text{ELL} \leq 6$  yrs), or year (2011 or 2012) will be observed on literacy achievement and on mathematics achievement as measured by scaled scores on the AABE for eighth grade ELLs in a district in northwest Arkansas.

## **Implications**

The development of academic language is essential to learning. ELLs pose specific challenges for educators. Educators must assist ELL with mastery of rigorous academic concepts as well as support deep understanding of academic language.

Consequently, a careful determination must be given to ensure that the best strategies are used. Researchers have debated which approaches are the most effective. These include productive group work, the Gradual Release of Responsibility Model, cognitively guided instruction, cooperative learning, and computer assisted instruction (Lourdes, 2012; Fisher, 2009).

Students are enrolled in the READ 180 program because of two factors: (a) limited English proficiency and, (b) low performance on standardized testing. Typically, students are considered for the READ 180 program if they place in English Language Level 2 or 3 (ELL 2 or ELL 3) as measured by the English Language Development Assessment, a state-mandated assessment that is administered annually to all students who are identified as ELL. Typically, students who are at an ELL 1 level are placed in sheltered instruction classes. Students who score above an ELL 3 are generally supported by regular education teachers who are trained in ELL strategies.

Because of the criteria that result in READ 180 program placement, it is expected that the participants would have generally lower AABE scores than the students who do not participate in the program. If a student has scored at the Basic or Below Basic level on prior AABE exams, it is highly likely that he or she would be placed in READ 180. This results in a cohort of students with rudimentary skills in literacy and illuminates the reason that student scores for this group were lower than for those who did not participate in READ 180.

Interpretation of the results of this study must be compared to the review of related literature. Most of the existing research related to the READ 180 program has been published by Scholastic. In articles provided by Scholastic, the developer of the

program, students who participated in READ 180 consistently scored significantly higher than control groups on the respective standardized tests administered within their districts. Studies published by Scholastic include those from Orange County, Florida (see Scholasti, 2009a), the Austin Independent School District, the Desert Sands Unified School District, the Holyoke Public School District, the Los Angeles Unified School District, the Clark County School District, and the Seminole County Public School District (see Scholastic, 2011). The outcomes in every one of these studies are in direct contrast to the findings of this study, in that READ 180 participation was associated with lower, not higher, test scores for the students in this study. This result may be attributable, in part, to the fact that students participating in the READ 180 program had lower baseline academic and language skills than students in traditional classrooms used to collect data in the aforementioned studies by Scholastic.

When generalizing the results of this study to other groups, it is important to remember several elements. First, academic vocabulary and knowledge are acquired as a result of three important factors: time, effective pedagogy, and the amount of formal education in a student's native language (Shippen et al., 2005). According to the Association for Supervision and Curriculum Development (2015), it typically takes 2 to 3 years of ESL classes for a typical student to be in school. However, if a student has little or normal schooling before coming to the United States, it may take as long as 7 to 10 years to reach grade level norms in literacy. Educators must realize that although an ELL may be able to pronounce words and communicate in English, the student may not comprehend the academic concepts. Basic Interpersonal Communication Skills and Cognitive Academic Language Proficiency are not synonymous.

It is difficult to generalize the findings of this study to other populations. The findings of this study indicate that READ 180 is not an effective intervention that can assist with language acquisition. Furthermore, as the state of Arkansas transitions from the AABE to testing based on the Common Core State Standards (CCSS), it will be difficult to generalize the findings of this study. According to the Center for Applied Linguistics, previous state standards focused primarily on the skills of reading and writing. Under the CCSS, students will be required to practice with complex text and academic language (TESOL, 2015). Furthermore, students must be able to comprehend and use the text to analyze and defend a position. The first generation of the READ 180 program did not align to the demands of the CCSS. Scholastic is touting a Next Generation software that aligns READ 180 to CCSS. Further, independent research will be needed to determine whether the program is effective. The READ 180 program used in the northwest Arkansas district in 2011 and 2012 did not prove to significantly increase student achievement on the AABE.

When the implications of this study are considered, it is important to identify some design limitations. First, the groups of students were predetermined; therefore, the cohort of students could not be manipulated to achieve homogeneity of groups prior to testing. I did not designate whether a student participated in the READ 180 or when the pupil began receiving ELL services. This limitation obscures the effects that the chosen variables have on test scores because there are likely many other factors that influence achievement on the AABE.

A second limitation of the study is that student motivation during the test is an unknown. Anecdotally, student motivation on the day of the test to perform well makes a

difference in the total number of questions that the students try to complete and their efforts to answer as correctly as possible, particularly on open response questions. Student attendance during the school year, which was not determined, could have an impact on the student's AABE scaled score.

A third limitation of the study is the inability to assess homogeneity of the READ 180 program in individual classrooms. The level of training provided to each READ 180 teacher varies because some teachers were trained directly and then provided further training to others. Although all teachers have received some training before implementing the program in their own classrooms, it could not be determined if all training sessions over the years were conducted with the same fidelity. Consequently, if a teacher receives inadequate training, implementation of the program across the school may be inconsistent. Ideally, future research would rely on groups of teachers with similar training. This could be accomplished by providing a refresher course for teachers who use READ 180 in their classrooms. Additionally, teachers could be surveyed to determine basic characteristics of their training, including training length, topic coverage, and perceived value to the teacher.

Another limitation of the study is that students were grouped based on service length ( $6 < \text{ELL} \leq 6 \text{ yrs.}$ ). When grouping students based on service length rather than on ELL level, it is difficult to determine if the changes in scores were due to the ELL intervention or to language acquisition as a result of time. It is recommended that for further studies, students be grouped based on ELL levels, which more accurately represent English language proficiency. The failure to group students based on ELL

levels in this study arose because the information is not stored in APSCN and becomes extremely time consuming to obtain.

An important consideration in comparing average test scores, particularly between years, is that the state does not reveal its scoring metric. The histograms of average scores from 2011 compared to 2012 would suggest that the scoring metric changed in some way that caused the scores in the middle of the range to trend higher in 2012, without changing the low or high ends. Data from more than 2 years might help to identify factors that lead to such shifts.

## **Recommendations**

### **Potential for Practice/Policy**

This study was designed to determine if there were significant effects of READ 180 intervention (participated or did not participate), ELL service length ( $6 < \text{ELL} \leq 6$  yrs), and year (2011 or 2012) on literacy and mathematics achievement as measured by scaled scores on the AABE for seventh and eighth grade ELLs in a district in northwest Arkansas. This study compared the scaled scores of students for each of the middle and junior high schools that implemented the READ 180 program. The findings of this study have direct implications for educational policies and practices in districts in Arkansas that are considering adopting a program that can increase student literacy achievement.

School districts should determine the best pedagogical strategies that can address the needs of ELL. With this in mind, administrators and educators must use limited financial resources and personnel on programs that demonstrate effectiveness. Within this study, I examined whether the READ 180 intervention would have an impact on literacy and mathematics scaled scores for 7th and 8th graders as measured by the AABE.

According to the findings, students who participated in the READ 180 did not have higher scores than students who participated in the traditional classroom.

Within the review of literature, it was demonstrated that CAI can be an effective tool that can promote reading instruction (Larson, 2007, p.148). Elements that influenced the effectiveness of CAI include high levels of interactivity, the utilization of effective reading strategies, and high learner motivation. Although these elements are important, educators should evaluate the effectiveness of their current English Language Learner programs and whether or not they significantly increase student achievement. Districts should determine whether it would be beneficial to invest in professional development rather than invest in purchasing in the READ 180 program.

School districts must determine whether or not teachers have the proper training to implement language acquisition strategies. Many of these strategies do not require the purchase of a prepared curriculum or software. Rather, the strategies involve a difference of pedagogy. These strategies promote language acquisition and the comprehension of academic content. School administrators may determine the need for training through regular classroom observations, Professional Learning Community meetings, surveys, and classroom walkthroughs.

### **Future Research Considerations**

Educators have an imperative to maximize the academic achievement of all students. The ability to solve complex problems, communicate effectively in writing, decipher the text, and perform mathematics is demanded by business and industry. Schools must seek educational tools and pedagogical methods that will maximize the

success of all pupils. In future studies, it is recommended that researchers consider the following:

1. Conduct a longitudinal study to determine if there is a significant increase in literacy scores for participants in the READ 180 over time. Since ELL take many years to acquire literacy skills, it will be beneficial to observe the educational progress longitudinally. The researcher may compare the literacy and mathematical achievement with a control group.
2. Conduct a study that compares groups of students based on their ELL level as defined by the English Language Development Assessment. Each year, ELL are required to take the this assessment, per Arkansas DOE guidelines. The assessment provides a summary of the student's language performance. It is recommended to analyze the performance data for students at the same ELL level as this step was not done within the study because ELL data are not stored within APCS. N.
3. Determine the type of training provided to all teachers within the study. As a result of possible differences in training, a researcher cannot ensure that the READ 180 program was implemented uniformly within all schools. This variation may alter the academic achievement of students. It is recommended that future researchers interview principals and teachers and determine the type of training provided to all READ 180 teachers. Furthermore, it is recommended that researchers interview teachers and determine the level of implementation.



4. Examine the effects of the READ 180 program on student achievement on the ACT Aspire examination.
5. Examine the effects of the READ 180 program on student achievement for students with different native languages. For example, are the effects of the READ 180 program for students whose native language is Spanish different than for students whose native language is Marshallese?

Schools are becoming increasingly diverse. These changes reflect the changing demographics of the United States. With these changes comes increased needs of teachers and educators. Teachers must be equipped with the resources necessary to properly educate students and prepare them for college and careers. At the foundation of learning is the ability to read and to comprehend academic content. Research demonstrates that an effective reading program promotes alphabets, reading fluency, and effective reading comprehension strategies (HSU, 2012). Technology can be a resource that is used by educators to assist students as they improve their literacy achievement.

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# Appendix A



## Status of Request for Exemption from IRB Review (For Board Use Only)

Date: 4/2/14

Proposal Number: 2014-024

Title of Project: Effects By Years Receiving ELL Services of Using Read 180 on Literacy and Mathematics Achievement

Principal Investigator(s) and Co-Investigator(s): Paul Griep pagrlep@cox.net

- Research exempted from IRB review.
- Research requires IRB review.
- More Information is needed before a determination can be made. (See attachment.)

I have reviewed the proposal referenced above and have rendered the decision noted above. This study has been found to fall under the following exemption(s):

1  2  3  4  5  6

In the event that, after this exemption is granted, this research proposal is changed, it may require a review by the full IRB. In such case, a *Request for Amendment to Approved Research* form must be completed and submitted.

This exemption is granted for one year from the date of this letter. Renewals will need to be reviewed and granted before expiration.

The IRB reserves the right to observe, review and evaluate this study and its procedures during the course of the study.

A handwritten signature in cursive script that reads "Rebecca O. Weaver".

Chair  
Harding University Institutional Review Board