ABSTRACT

Emilie Lawrence Simeon, PROGRAM EVALUATION OF *READING PLUS*: STUDY OF THE IMPACT ON READING ACHIEVEMENT FOR STUDENTS WITH DISABILITIES IN MOORE COUNTY SCHOOLS (Under the direction of Dr. James McDowelle) Department of Educational Leadership, November, 2014.

The Superintendent of the Moore County Schools requested program evaluation for the purpose of determining the effect of remediation programs on achievement for students in the school system. This evaluation examined the intended purposes, actual uses, and benefits of the Reading Plus program on reading skills for Students with Disabilities. Data results from both qualitative and quantitative sources were analyzed to determine impact of the program.

The study revealed that students in grades four though nine participate in the Reading Plus program for remediation purposes. The program, which is based on research regarding eye movements during the reading process, controls the speed of the eye movement during reading and trains the eye to travel more fluidly across written script. Reading Plus curriculum includes the five key reading areas determined by the National Reading Panel of 2000. Results of the study indicate that the Reading Plus program is both cost effective and appropriate for most Students with Disabilities at elementary, middle, and high school levels.

PROGRAM EVALUATION OF *READING PLUS*: STUDY OF THE IMPACT ON READING ACHIEVEMENT FOR STUDENTS WITH DISABILITIES IN MOORE COUNTY SCHOOLS

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by

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Chapters 1-3 were written in cooperation with my colleagues:
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PROGRAM EVALUATION OF *READING PLUS*: STUDY OF THE IMPACT ON READING ACHIEVEMENT FOR STUDENTS WITH DISABILITIES IN MOORE COUNTY SCHOOLS

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CHAPTER 1: INTRODUCTION

Explication of Problem of Practice

According to a 2002 report, "The United States Department of Education reported that more than 8 million students in grades 4–12 are struggling readers" (Grigg, Daane, Jin, & Campbell, 2003). In addition, expert on poverty Ruby Payne indicated that children from language enriched backgrounds and families that encourage literacy experiences may enter school with a stronger vocabulary than children from families in poverty because of mental resources, support systems and relationships (Payne, 2005).

The issue of academic deficiencies and need for reading intervention has not been a recently identified problem despite new legislation at the federal and state levels. In 1959 a reading expert cited reading issues that resonate today:

> Criticisms of the American school system are appearing in increasing numbers. In too many instances, the critics appear to engage in wishful thinking and long for the 'good old days' when almost anyone who attended school succeeded in securing an education—at least to a degree. They appear to overlook the fact that attendance is now compulsory for all children beyond the age when many formerly withdrew to take jobs. So often, too, these critics seem to believe that school difficulties arise merely because proper attention is not being given to teaching 'the three R's.' Some firmly attest that reading instruction was more efficient twenty-five to fifty years ago. Others argue that reading instruction is more efficient today, in spite of the fact that eye-movement studies indicate that not more than 40 percent of the total population can be considered to be really efficient in the act of reading. (Taylor, 1959, p. vii)

In 2006, ACT, Inc. released a report called *Reading Between the Lines*, which provided evidence to support increased reading requirements because, while the reading demands of college, workforce training programs, and workforce citizenship have risen over the past 50 years, K–12 academic texts have become less demanding and less complex. Lesnick, Goerge, Smithgall, and Gwynne (2010) noted that early reading achievement impacted later academic success because the third-grade reading level was a predictor of eighth- and ninth-grade performance, high school graduation and college attendance. In addition, other researchers noted that 75% of students identified with reading problems in the third grade struggled with reading in the ninth grade (Francis, 1996; Francis et al., 2005; Shaywitz, Escobar, Shaywitz, Fletcher, & Makuch, 1992), and that third-grade students with poor skills in word recognition when applied to texts were not likely to improve their reading skills with any significance by the end of eighth grade (Felton & Wood, 1992).

The *No Child Left Behind Act of 2001* (NCLB), signed into law by President Bush in January 2002, reauthorized the *Elementary and Secondary Education Act* (ESEA), a law which encompassed Title I and was first enacted in 1965 as federal aid for disadvantaged students. NCLB required annual testing, annual school report cards, specific teacher qualifications, included funding to target poor children, and offered a competitive grant program to fund research-based reading programs for disadvantaged students. Within the NCLB mandates, states were required to bring all third-grade students up to a proficient reading level by 2013–2014 (U.S. Department of Education, 2004b).

Along with changing federal and state laws, the Common Core curriculum implemented in the fall of 2012 required students to read and understand material within complex literary and informational texts (Common Core State Standards, 2012b). The Common Core reading

curriculum framework was designed to bolster students' reading skills through sophisticated reading material that encouraged strong fluency and comprehension.

Mandates of *No Child Left Behind*, coupled with 2012 North Carolina state law and expectations of newly-implemented national Common Core curriculum, have dictated that students must read on grade level by the end of third grade. Improving reading has also continued to be a common theme at the federal level and North Carolina has followed its lead by imposing laws about reading. In 2012, the North Carolina General Assembly passed legislation requiring students at the end of third grade to read on grade level as measured by the North Carolina End-of-Grade (NCEOG) reading test. Based on the implementation of the 2012 law, if the student cannot read on the third-grade level as determined by the EOG, the student would be retained in third grade unless the child attended a remedial summer reading camp for the purpose of improving reading skills. Students who did not pass assessments at the end of the summer camp program (NCDPI, 2013) would be retained, remediated during the fall of the next school year (NCDPI, 2013), and reassessed in November (North Carolina General Assembly, 2011). To fulfill the requirements, these non-proficient eight-year-old students would have faced as many as three lengthy, formal reading assessments between May and November.

According to the North Carolina Department of Public Instruction's (NCDPI) *More Information* (NCDPI, 2012a), the requirements and accountability purposes of North Carolina Accountability Based Curriculum (ABCs) and federal Annual Measurable Objectives (AMOs) stated,

> No Child Left Behind (NCLB) affects your school and every public K-12 school in the country. Key requirements of the law were: closing achievement gaps, holding schools

> accountable for all students and having a Highly Qualified teacher in every classroom. (para. 1)

The North Carolina testing requirements under the ABC model and the requirements of No Child Left Behind (NCLB) impacted each school's performance based on the test results of students enrolled in the school. However, students in a school could have performed well on ABC requirements, resulting in the school's designation of a High Growth School or School of Excellence, while collective student scores did not meet the expectations set forth in NCLB. The ABC program established performance standards for the school as a whole, as well as achievement levels for individual students. Based on North Carolina state test results, students were ranked at achievement levels one, two, three, or four, with levels three and four as indicators of grade level proficiency. The collective student test score results determined the school's growth status and designation such as School of Excellence or High Growth. NCLB, an initiative by the U.S. Department of Education, offered an additional challenge with the addition of the Annual Measureable Objective (AMO), which included goals for groups of students. AMOs were pre-determined by the NCDPI for areas of student attendance, graduation, student participation in assessments, and student performance on North Carolina End-of-Grade and North Carolina End-of-Course tests in the areas of reading and mathematics. These AMOs were required for each designated group of students, and North Carolina End-of-Grade or North Carolina End-of-Course test results were reported as a group. Also, AMOs provided pre-determined intervals intended to assist schools in reducing the achievement gaps over a six-year period from 2012 to 2018. Student subgroups determined by NCDPI included White, Black, Hispanic, American Indian, Asian, Pacific Islander, Two or More Races (multiracial, although Hispanic overrides all other races of the student), Economically Disadvantaged, Limited English

Proficient, Students with Disabilities, and School as a Whole (all students). Within each school's improvement process, the NCDPI set AMO goals for each subgroup on each test. Schools were required to reduce the achievement gaps between subgroups of students based on achievement of the AMOs (NCDPI, 2012a). Reading became more important because stronger readers were assumed to produce better test scores.

History of Problem

The problem that precipitated this study was that there were no local data to support the use of the *Reading Plus* program for reading intervention, though at least three schools were using it for the purpose of improving student reading achievement. The issue was compounded by the fact that schools or administrators across the system had chosen a variety of different intervention programs without LEA coordination or internal analysis. Therefore, the purpose of this study was to determine the extent, if any, of the *Reading Plus* intervention program on the reading achievement of students at elementary (grades 4 and 5), middle (grades 6, 7, and 8), and high school (grade 9) levels in the Moore County Schools, as well as the *Reading Plus* impact on the students with disabilities who were being served in these grades, so that the administration could make informed decisions about the program. Reading intervention programs targeted academic needs of students in one or more of the students' reading deficiencies. Each intervention program claimed that its program is based on the goals and skills established for purpose of reading and that the use of the program improved students' skills such as fluency, phonics, vocabulary, or comprehension.

Individual school administrators within the Moore County Schools system selected reading intervention programs based upon the individual needs of their students. Multiple reading programs have been used across the system intended to improve reading deficiencies.

These programs included *Corrective Reading*, *Earobics*, *Fast Forward*, *Intervention Kits*, *Language for Learning*, *Leveled Literacy Intervention*, *Read 180*, *Reading Mastery*, *Reading Plus*, *Reading Recovery*, *System 44*, and *S.P.I.R.E.*, a program specifically used for students with disabilities (Moore County Schools, 2013).

Proficiency, a standard cut score according to the 2011 North Carolina Accountability Model, referred to the requirement that students must have scored at a pre-determined level to be considered proficient on any North Carolina End-of-Grade or End-of-Course assessment. Based on 2011–2012 North Carolina End-of-Grade reading assessment data for students in grades 3–8, and on North Carolina End-of-Course English I assessment for students in grade 9, not all students scored adequate proficiency in reading. At Cameron Elementary School, white students in grades 3–5 scored 80% proficient in reading, Black students in grades 3–5 scored 29.4% proficient in reading, Students with Disabilities in grades 3–5 scored 35.7% proficient in reading, and Economically Disadvantaged students in grades 3–5 scored 57.5% proficient in reading. At New Century Middle School, 82.5% of White students in grades 6-8 scored proficient in reading, 57.1% of Black students in grades 6–8 scored proficient in reading, 46.7% of Students with Disabilities in grades 6-8 scored proficient in reading, and 67.2% of Economically Disadvantaged students in grades 6–8 scored proficient in reading. At Pinecrest High School, 95% of White students in grade 9 were proficient in reading, 74.6% of Black students in grade 9 were proficient in reading, 34.1% of Students with Disabilities in grade 9 were proficient in reading, and 77.8% of Economically Disadvantaged students in grade 9 were proficient in reading. Though achievement gaps may appear in the data, for purposes of this study, achievement gaps were not studied.

Statistics (Complete College America, 2013) indicated that college graduation rates were low for students who are low-socio-economic, part-time, African American, Hispanic, or older. In North Carolina, 31.8% of college freshmen enrolled in two-year college programs require remediation, while 5.3% of freshmen in four-year college programs require remediation. In addition, graduation rates for remedial students are 4.5% for on-time graduation from a two-year program and 20.8% from a four-year program (Complete College America, 2013).

Because the *Reading Plus* program was used at the elementary, middle, and high school levels, it was assumed by administrators and teachers that gains were being made at all levels and that, additionally, students with disabilities who received the *Reading Plus* interventions found further improvement in their reading skills. However, the Moore County School system had not investigated the program impact on student achievement in reading or the financial feasibility of the program, which cost $25 to $55 per student for one year. In addition, cost may be impacted by length of contract and number of seats. Therefore, an administrator who needed to remediate 100 students might pay $4,400 per year for the program from the school budget. Gregory W. Taylor, Vice President of Tarmac Educational Services, Inc. submitted a *Reading Plus*™ Software Proposal to Dr. Kathy Kennedy, Associate Superintendent Instructional Design and Innovation on March 25, 2013. Specific pricing for Cameron Elementary School, New Century Middle School, and Pinecrest High School were provided and shown in Table 1.

A review of historical research literature indicated approaches to reading instruction and intervention have changed since the 1800s. Early reading research revealed an original emphasis on the teaching of reading through the *deaf mute* method, an approach to reading through meaning and context clues while reading whole words or passages. This process was a sight

Table 1

Projected Cost

School	Description	Student Seats	Total
Cameron Elementary	New Student seat subscriptions for one year access	50	$2,750.00
New Century Middle	New Student seat subscriptions for one year access	100	$4,400.65
Pinecrest High	Converted 25 Student seats-subscription fee	200	$2,000.00

word method which involved obtaining information from words and pictures on the written page. Later reading instruction methods emphasized the use of phonics as a means of helping students to sound each letter in isolation rather than obtain meaning from context (Rodgers, 2001). In the 1955 book, *Why Johnny Can't Read: And What You Can Do About It*, Rudolph Flesch described a necessary method of teaching reading that included 44 phonetic sounds and application of the sounds to more complex literature (Flesch, 1955). Kamil, Mosenthal, Pearson, and Barr (2000) verified the importance of the method of phonetic instruction in *The Handbook of Reading Research*.

An early effort by researchers in the area of ophthalmology supported that a reader's eye-movements, or saccades, created a vehicle for identifying reading problems through the types and lengths of the fixations and movements (Tinker, 1933). More recent studies using technology noted that fluid eye-movements and the successful cognitive process of reading were related (Rayner, 1998), indicating that a student's need for remediation was more complex than the simple need for assistance in connecting sounds to symbols. However, the National Education Association (NEA) stated in its reading policy that reading is the "gateway" to learning and achievement; therefore, the NEA has not promoted any particular method of reading instruction over another. NEA's statement established the point that reading instruction should be individualized, thus, NEA would not dictate a preferred method for educators to follow.

In 2000, a National Reading Panel (NRP) report recognized the importance of key reading components, including phonemic awareness, phonics, fluency, vocabulary, and comprehension. The NRP (2000) noted a "close relationship" between the student's ability to read fluently and the student's ability to comprehend what he is reading (p. 1). Five components necessary to reading instruction and noted by the NRP included instruction in meaning as well as

sound, therefore providing multiple ways for the student to address and absorb reading material (NRP, 2000). *Reading Plus*, which was the focus of this program evaluation, used current computer technology to encourage smooth eye-movements in reading and combined sight, fluency, and comprehension to improve the student's reading.

Statement of Problem of Practice

The acquisition of reading skills by K–12 students may be essential to academic and career success because reading is required for academic tasks, as well as daily adult activities. School-age students who do not read well may have more difficulty with both academic assignments and reading for pleasure. As adults, these same students with weak reading skills may also experience difficulty following written directions or reading a newspaper. Career-oriented reading may require the worker to read and comprehend complex documents. Therefore, students who are successful in reading may be more likely to find success in adult life activities that involve both personal reading and career-related reading.

Previously in the school district involved in this study, the Moore County Schools district level administrators allowed school principals and faculties to select reading programs based upon their own student needs and budgets. Program selections varied by training, implementation, and fidelity, which is implementation according to program design. This selection process resulted in a list of at least 13 different reading programs in 23 schools across the district. In addition, as more reading programs were purchased and as data became more important, the district administration began requiring schools to provide a streamlined evaluation of the implemented program, including data results for groups of students and the school population as a whole in response to Race to the Top (RttT) requirements and methods of monitoring achievement data. Superintendent Dr. Aaron Spence expected schools to provide

data showing that their selected intervention programs were effective for the purpose of improving students' reading. For streamlined evaluation, each school provided pre and/or post data using scores or information the school deemed important to its purpose. This study sought to provide a review of reading scores, Lexile levels, and teacher information regarding implementation of the *Reading Plus* program and fidelity to implementation in order to produce a more thorough result. Though data regarding achievement gaps among groups may have existed, for the purpose of this study, achievement gaps were not examined because researchers did not have access to Free/Reduced student data. Further study may be necessary to analyze achievement gaps.

The district superintendent requested the evaluation of reading programs to determine whether or not data supported the current programs, whether or not these programs improved student achievement and, particularly, proficiency in reading. This study focused on the impact of *Reading Plus* on student reading achievement in elementary, middle, and high school, so that information was gleaned to provide an objective view of student academic progress in reading. Three schools were included in the study: Cameron Elementary School, located in rural northeastern Moore County, with 242 students; New Century Middle School, a rural school in central Moore County with 550 students; and Pinecrest High School, in southern Moore County serving 1,982 students, according to 2011–2012 data (NCDPI, 2012b).

Public scrutiny has become more obvious because school report cards (including test scores, attendance, teacher data, and student data) are published in newspapers and state websites (NCDPI, 2012b). Special stipulations for funding from RttT sources required LEAs to adhere to stringent curriculum and testing requirements. In addition, because of the budgetary and curricular concerns about intervention programs, this specific study assisted the Moore County

Schools in making decisions about the *Reading Plus* program and which levels or students, if any, should receive the program instruction. Data released by the North Carolina Department of Public Instruction for 2011–2012 indicated that students at or above proficient in Moore County were at the 74.7% level. At Cameron Elementary School, third-grade students scored 71.3% proficient in 2010–2011 and 70.4 % for 2011–2012. Both of these scores were below the district-wide average of 74.7 %. At New Century Middle School, 2010–2011 data revealed student scores at or above proficient as 80.5%, as well as 2011–2012 reading proficiency for New Century at 77.8%. At Pinecrest High School, reading proficiency based on North Carolina English 1 EOC was 89.7 in 2010–2011 and 89.6 % in 2011–2012. Despite the fact that scores from these three schools averaged at or above the MCS average, each school still served students who did not read at the expected proficiency level and were, therefore, in need of reading remediation.

Research Questions and Methodology

Based on the study design, four questions are pertinent to this research:

1. To what extent, if any, did the *Reading Plus* program impact student academic achievement in reading for those students enrolled in the program in grades four and five based on the student Lexile scores generated from the Scholastic Reading Inventory (SRI)?
2. To what extent, if any, did the *Reading Plus* program impact student academic achievement in reading for those students enrolled in the program in grades six through eight based on the student Lexile scores generated from the Scholastic Reading Inventory (SRI)?

3. To what extent, if any, did the *Reading Plus* program impact student academic achievement in reading for those students enrolled in the program in grade nine based on the student Lexile scores generated from the Scholastic Reading Inventory (SRI)?
4. To what extent, if any, did the *Reading Plus* program impact student academic achievement in reading for students with disabilities enrolled in the program based on the student Lexile scores generated from the Scholastic Reading Inventory (SRI)?

Due to the nature of this study, it was determined that a program evaluation was the best method to use in determining the effectiveness of the *Reading Plus* program. A program evaluation is a systematic method for collecting, analyzing, and using information to answer questions about projects, policies, and programs, particularly about their effectiveness and efficiency. This study followed a research design pioneered by Daniel Stufflebeam, the Context-Input-Process-Product (CIPP), with regard to program evaluation standards which were developed for evaluators and other audiences to judge the overall quality of an evaluation (Fitzpatrick, Sanders, & Worthen, 2011). While program evaluations were a relatively recent phenomenon, the process of planned social evaluation dates as far back as 2200 BC (Shadish, Cook, & Leviton, 1991). Evaluation became particularly relevant in the United States during President Lyndon Johnson's "Great Society."

Use of this model provided information to improve the quality of decisions made by stakeholders, Moore County Schools, with a program evaluation of the *Reading Plus* program and allowed these stakeholders to make good decisions based on valid information. Two principles of this model, (a) focus on serving decisions, and (b) judging merit and worth, provided a framework for making decisions that improve products. The intent of the CIPP model as used in this program evaluation was to provide guidance for continuing, modifying,

adopting, or terminating the *Reading Plus* program in Moore County Schools based on assessing outcomes and side effects of the program.

The purposes of product evaluation were to relate outcomes to objectives and to assess the overall worth of a procedure in terms of its effects. An advantage of the CIPP model was that it allowed the program evaluators to think of evaluation as cyclical, rather than project based. This model provided evaluators the flexibility to evaluate the *Reading Plus* program in stages depending on the needs of the stakeholders (Alkin & Christie, 2004).

Although the context, input, and process of the *Reading Plus* program were critical depending on the stage of a program, district administrators in the Moore County Schools wanted informative data regarding the product of the program and, specifically, whether or not the program had improved reading achievement for those students enrolled in the program based on the student Lexile scores generated from the SRI.

By using the CIPP model, the *Reading Plus* program evaluation consisted of three steps focused on the product of the program. The first step was delineating the objectives of the program. The second step was obtaining information and data regarding those students who were enrolled in the *Reading Plus* program and by analyzing responses to survey questions. The third step was providing a report of the program results and achievements to the Superintendent and the Moore County School's Board of Education that was both descriptive and analytical.

This study was intended to investigate data and attitudes regarding the *Reading Plus* intervention program for struggling readers and the role of *Reading Plus* instruction in developing 21st century-ready students within Moore County Schools. This information was intended to provide administrators in the school system with valid information for future decisions regarding this particular program and its relationship to reading achievement in

elementary, middle, and high school students, as well as students with disabilities throughout these three levels.

Definitions

Within this study, a variety of terms were defined or clarified. The following terms were important and included in the study:

Achievement Gap—the difference between the scores of the highest performing group of students and a lower performing group, such as Male versus Female or Economically Disadvantaged versus Non-Economically Disadvantaged ("Achievement gap," 2011).

Annual Measureable Objective (AMO)—pre-determined scores designated as targets for groups of students.

Comprehension—"Reading comprehension is the construction of the meaning of a written text through a reciprocal interchange of ideas between the reader and the message in a particular text" (Harris & Hodges, 1995, p. 39).

Common Core State Standards (CCSS)—reading and mathematics curriculum designed at a national level.

Decoding—the process of transforming information from reading into meaning.

Five domains of reading—phonemic awareness, phonics, fluency, vocabulary, and comprehension (National Reading Research Panel, 2000).

Fixation—concept of maintaining the eye on one location, word, letter or figure.

Fluency—reading text with speed, accuracy, and proper expression.

Interventions—a set of specific steps to improve a deficiency.

Leveled readers—reading books that are a part of a larger collection of books organized in levels of difficulty (Pinnell, 2013).

Lexiles—algorithm that analyzes sentence length and vocabulary; information about either an individual's reading ability or the difficulty of a text, like a book or magazine article; the Lexile measure is shown as a number with an "L" after it—880L is 880 Lexile (MetaMetrics, Inc., 2013b).

National Reading Panel (2000)—panel of reading experts, who at the request of Congress assessed the status of research-based knowledge about reading and, as a result, endorsed five instructional methods for the teaching of reading:

1. Explicit Instruction: Students are given definitions or other attributes of words to be learned.
2. Implicit Instruction: Students are exposed to words or given opportunities to do a great deal of reading.
3. Multimedia Methods: Vocabulary is taught by going beyond text to include other media such as graphic representations or hypertext.
4. Capacity Methods: Practice is emphasized to increase capacity through making reading automatic.
5. Association Methods: Learners are encouraged to draw connections between what they do know and words they encounter that they do not know. (NRP, 2000, p. 3)

NCLB—acronym for *No Child Left Behind*, the former Elementary and Secondary Education Act (ESEA) and the federal bipartisan reform law passed in 2001, and was intended to create standards and processes that result in improved student achievement across among all students (U.S. Department of Education, 2004a).

Phonics—method of reading (or teaching reading) wherein the reader pronounces each sound of the alphabet, including consonants and vowels, and blends sounds together to create words.

Phonological awareness—reader's cognizance of the sounds of letters and the process of blending sounds to vocalize words.

Prosody—the patterns of stress and intonation in a language denoting fluency; speech rhythm

Reading—cognitive process through which meaning is derived from symbols.

Reading comprehension—cognitive process of deriving meaning from words or groups of words or text and the level to which the meaning is understood.

Reading Plus—commercial reading intervention program which claims to prepare students to engage with complex text by developing capacity, efficiency, and motivation and to improve silent reading fluency, reading rate, and stamina.

Saccade—smooth eye-movement measured by ophthalmic equipment.

Tachistoscope—mechanical device that measures eye-movement and is used in speed reading programs.

Visagraph—an eye-movement recording device that analyzes visual, perceptual and information processing deficiencies.

Whole language—method of teaching reading that emphasizes meaning of the sentence or passage and is noted as a method that contrasts with phonics.

Whole word—reading method of addressing a word in context rather than by sounding out the individual letters.

CHAPTER 2: REVIEW OF LITERATURE

The ability to read information with comprehension was a core, literacy skill that determined the success of each student in today's world (Honig et al., 2008). Thomas Jefferson stated, "Democracy . . . can survive and flourish only with a literate citizenry" (as cited in Honig et al., 2008, p. 2). "In order to read, a child must develop an awareness that spoken words can be pulled apart into phonemes and that the letters in these written words represent these sounds" (Lyon, Shaywitz, & Shaywitz, 2003, p. 7). McCoach, O'Connell, Reis, and Levitt (2006) reiterated that "Learning to read was one of the most important academic skills that students develop during the first 2 years of school" (p. 14). According to the NRP (2000), the ability to read included being able to recognize printed words through decoding and finding meaning in words through comprehension. Both decoding and comprehension depend on the student's cognitive abilities and memory. Further, if the student used all or most of his available cognition for one process, such as decoding, then few resources remained for comprehension.

A student's ability to read ultimately affected his/her progress throughout his/her educational career and determined future aspirations of vocational choice. Within the medical community, the American Academy of Pediatrics (2012) provided information and support concerning the development of children and reading for parents on their webpage, which explained that children generally learn to read by six or seven years of age, although some learn earlier. But the Academy noted that early readers might not continue to excel because later readers tended to accelerate reading and learning in the second or third grade. The Academy's comments warned parents pushing children to read too early might create problems, since a love of learning could not be artificially created or forced.

Reading instruction progressed from the *deaf mute* methodology (Rodgers, 2001) of the 1930s to the current, specialized computer methodology of *Reading Plus* (Marrs & Patrick, 2002). The literature review begins with an overview of the history of reading instruction. Major controversies surrounding the phonics approach versus a whole language approach are included in the review along with information regarding the necessity of individualizing reading instruction for students who are not achieving as expected in the area of reading. The history of eye-movement research details the information of a relationship between ophthalmological data and reading achievement, which results in the Reading Plus program. At the end of the 20th century a national focus by the NRP (2000) spurred the identification of foundational reading methods. An overview of the Reading Plus program detailed the history and methodology of the program. The chapter ends with an overview of current reading initiatives, the challenge for older readers and factors that affect reading achievement, all of which support the case for individualized reading intervention such as *Reading Plus*.

History of Reading Instruction

Reading teachers since the 1900s have explored a variety of methodologies to find the correct process for beginning readers. Reading *experts* such as Gates and Gray downplayed the importance of phonics after 1918. Gates introduced intrinsic phonics and Rudolph Flesch emphasized the importance of systematic phonics. Geraldine Rodgers (2001) discovered two very different types of readers labeled from 1930s reading instruction materials. The first type was labeled the *meaning* type, while the second type was labeled the *sound* type (Rodgers, 2001). The introduction in 1930 of the *deaf mute* method of reading was, according to Rodgers (2001), “a setback; it focused more on sight words, less on phonics” (p. 956). The *meaning* type reader learned with the conscious help of context, and so he/she could never read without the

slower process of comprehending each passage before moving onto the next. The *meaning* reader was forever hampered by reliance on context clues in the text. This reader was slowed by having to continually and consciously focus on decoding print. This type of reader devoted part of his/her attention to understanding the message or to comprehending what was being read (Rodgers, 2001), so most likely it deeply diminished an individual's enjoyment of reading.

According to Rodgers's (2001) research of the *deaf mute* method, "The *sound* type learner read by the sound of print, not with the conscious use of context, and so (he/she) can read fluently" (p. 1,518). The *sound reader* developed an automated reading process. Because of this automation, the reader was able to devote all attention to understanding the text. This type of reader does not have to devote his/her attention to constantly decoding text while reading. The *sound reader* had the potential to develop into a successful reader. *Sound readers* could comprehend the text that they are reading without having to decode as they progressed through a reading selection they were reading.

Many problems were abundant with the *deaf mute* method of reading. This method primarily focused on students relying entirely on memorizing high frequency words and relying on picture or text clues to figure out words that they didn't know. Part of the *deaf mute* program that was detrimental to developing readers was the omission of teachers being required to listen to students read aloud. During the 1930s there was an emphasis on silent reading. The teachers missed an opportunity to detect students' difficulty in completing a reading selection. Possibly, the teacher may have noticed that fluency was low and also that students were struggling to comprehend what they were reading.

Teachers misinterpreted students' forced but divided attention as a strength. Even though students were focused, their focus was on understanding the actual words in the text and not the

meaning of the text itself (Rodgers, 2001). This caused a disconnection between a student's fluency and comprehension ability.

Rodgers (2001) witnessed third graders, who had been taught by *meaning***,** struggle to pronounce and understand words that first graders, who had been taught by *sound*, were easily able to decode and understand. She stated that most third-grade teachers did not even know there was a real problem with comprehension and decoding. Rodgers (2001) explained that low frequency words were more difficult to recognize and read independently because the words were not in their general vocabularies and did not evoke meaning connections to sound combinations or meaning.

The *deaf mute* method of 1930 was still firmly in place in America in 1962. Nila Banton Smith stated that in 1963, basal readers were used by 90% of first grade teachers on all or most days of the school year. Chall (1967) discussed in *Learning to Read: The Great Debate* that none of the basal series in 1962 were phonics series and all used the sight word method. These facts indicated that at least 90% of first-grade teachers in America were using the *deaf mute* method to teach beginning reading in 1962 (Rodgers, 2001).

The Reading Wars

The Reading Wars focused attention on the phonics approach versus the whole language approach to teaching reading. The first and most divisive issue in that conflict was the debate over the importance of phonics in early reading instruction.

The two theoretical approaches have been debated since the 1960s (Williams, 2009). Rodgers (2001) clearly stated her belief in the phonics approach, while others fully and emphatically supported whole language. Even though the two approaches were referred to differently from time to time, supporters on both sides of the argument were emphatic that their

approach to reading was the correct one. To understand the differences of opinion, it was important to understand what each approach entailed. Even though there have been volumes of research and hundreds, if not thousands, of reading programs designed utilizing each approach, there were still differences among researchers as to the best method to teach reading.

A National Education Association (NEA) report stated in its official reading policy, "that reading was the gateway to learning in all content areas and essential for achieving high standards" (NEA, 2013, para. 3). The NEA policy continued by stating**,** "to open that gateway for all students, the NEA, International Reading Association and many others believe it was counterproductive to promote any particular program, procedure, or method of reading instruction to the exclusion of all others" (NEA, 2013, para. 4). The NEA also lamented the fact that the war on reading had been "politicized adding that this does little to help students or teachers in the trenches" (NEA, 2013, para. 2).

Phonics supporters believed that children must be taught systematically about the letter-sound combinations that make up words. They believed that without this, children would struggle and fall behind as readers. Whole-language supporters believed that instruction starts with short, everyday words and sentences. To learn a new word, children looked first at its context, its first letters, or at a relevant picture to figure it out. They used both *leveled readers* and trade book classics (Williams, 2009). Leveled readers are books that were part of a larger collection of books organized in levels of difficulty. These books were leveled from easy books that a beginning reader would read to the longer, complex books selected by advanced readers. Some schools chose to house these books in a central location. Usually there were multiple copies of many books. This allowed teachers to work with small groups of students that had similar reading abilities (Pinnell, 2013).

The phonics supporters received a major boost with recommendations from two major groups. The NRP and the "*Reading First*" portion of the *No Child Left Behind Act of 2001* legislation recognized the importance of phonics instruction in successful reading programs. While some reading programs may have ignored phonics instruction, few ignored these elements completely (Williams, 2009). The NRP's report came to the clear conclusion that without some phonics instruction, whole language pedagogy was not enough. The report revealed the characteristics of phonemic awareness training most effective in enhancing reading and spelling skills, including explicitly and systematically teaching children to manipulate phonemes (Anderson, 2000).

Torgesen, Wagner, and Rashotte (1994) yielded insight on the importance of phonological skills in reading through Longitudinal Studies of Phonological Processing and Reading, during which time they explored three types of phonological skills, including phonological awareness, phonological memory, and rate of access for phonological information, with reading achievement. Research prior to this study indicated the following:

> (a) individual differences in phonological processes were predictive of later differences in development of reading skills; (b) training in phonological awareness, coupled with instruction in specific letter-sound relationships, significantly enhanced growth in early word-reading skills; (c) older (students who were) good and poor readers consistently differed in phonological processing skills; and, (d) phonological skills were related to one another in development. (Torgesen et al., 1994, p. 278)

In Torgesen et al.'s (1994) longitudinal study using 288 students, results implied that the stability of individual differences in phonological skills remained over time, or that poor readers in early grades continued to remain poor readers in subsequent grades.

Why Johnny Can't Read

In his book, *Why Johnny Can't Read—And What You Can Do About It*, published in 1955, Rudolf Flesch blamed all of the reading experts of the time for substituting the whole word method for systematic phonics in early reading instruction and accused them of causing "massive reading failure among the young. Flesch was also critical of teachers who explained student deficiency in reading as the student not being developmentally ready to read. Flesch claimed that his research overwhelmingly supported systematic phonics over the intrinsic method. He also claimed that the reading experts of the time had ignored their own research (Flesch, 1955). Flesch's comments may have been referring to Albert J. Harris, a senior editor of a very popular Macmillan reading series. This reading series claimed to introduce phonics to students when it instead relied on students comparing two words for similarities and differences. This reading series did not teach phonics even though Flesch's ideas were causing some reading experts to question the whole word method of teaching reading (Rodgers, 2001).

Whole word and the deaf mute method of teaching were essentially the same process with different names. These methods of teaching reading rely on students identifying words by sight. Student memorization of sight words or high frequency words and word association using context clues and pictures are the foundation of these methods of reading instruction. At the beginning of the 20th century these methods were much more than a methodology, they were a philosophy. The NRP (2000) determined that systematic phonics instruction leads to significant positive benefits for students in kindergarten through sixth grade and for children with difficulty learning to read. Kindergartners who receive systematic beginning phonics instruction read better and spell better than other children, and first graders are better able to decode and spell words. The students also show significant improvement in their ability to understand what they

read. Similarly, phonics instruction helps older children spell and decode text better, although their understanding does not necessarily improve. Later, Kamil et al. (2000) emphasized that favorable research in word identification "doesn't necessarily imply that such an advantage carries over to other areas of reading ability" (p. 89). The authors explained the difference between systematic and intrinsic phonics. *Systematic phonics* also called *synthetic phonics* is an instructional method in which early, intensive, phonic rules were taught in a deductive, part-to-whole manner by teaching letter sounds in isolation, which were then blended into words. *Intrinsic phonics*, also called *analytic phonics*, involves whole-to-parts strategy in which learned sight words are analyzed and phonics rules are inferred and discovered.

Throughout the previous century, reading specialists and researchers were divided into two categories. These two categories focused upon phonics and meaning, with each group using research to support claims of their superiority.

Eye-Movement Research and a Relationship to Reading

The *Reading Plus* program evolved from studies in eye-movement and the relationship of eye-movement to the reading process. While current literature indicates that eye-movement research relates to cognitive processes, the earliest research on eye-movement dates back to 1879 (Rayner, 1998). Early research focused on the impact of eye-movements on reading words with less emphasis on neurological processing, while in the 1980s and 1990s, evidence was collected on information regarding eye-movements, including reading fixation time and saccade length, in relation to language processing (Rayner, 1998).

In his compilation of 20 years of work in the area of eye-movement, Keith Rayner described three eras of research. The initial era began in 1879 with observations by Emile Javal, a French oculist, concerning the role of eye-movements in the process of reading; this era lasted

until 1920 (Williams, 2009). In the early work, Javal asked his subjects to read while wearing a small Plaster of Paris cupped device over one eye. The cup was fitted with a slender stick in the center that moved as the eyeball moved. By noting the series of jerks and pauses, known as saccadic movements, Javal discovered the "oculo-motor nature of the reading process" (Williams, 2009, p. 17). During the first era of research, it was determined that readers do not perceive information during actual eye-movements or saccades but rather during the time when the eye is fixed on a word (Rayner, 1998).

The second era reported in the literature included important work by Miles Tinker and extended from the 1920s through the 1960s (Rayner, 1998). Interest in the impact of eye-movements on the process of reading can be found in notable literature beginning in 1928 with work by Tinker (1933), who produced records of eye-movement measures on reading performance during the previous fifteen years. Four methods were used to record eye-movement and pauses during reading and included:

1. Direct or indirect attachment of mechanical recording apparatus to the eyeball;
2. Photographing (a) eye with point of reference attached to eyeball, or (b) beam of light reflected from mirror held gently against closed lid of one eye;
3. Counting eye-movements from observation of eye with or without auxiliary aids (i.e., mirror, telescope);
4. Photographing the image of a light reflected from the surface of the cornea. (Tinker, 1933, p. 381)

This work additionally noted that, "there is no such thing as a fixation point in reading, but rather a fixation field" and Tinker stated that "the most important use of eye-movement measures has been to discover the fundamental nature of oculomotor habits in various reading

situations" (Tinker, 1933, p. 382). The significance of this finding appeared to be that the fluid reader does not read word by word but rather by sweeping the eye across multiple words which are then absorbed for comprehension.

Tinker (1933) documented that a reader's eye-movements provided a vehicle for identifying reading deficiency, immature reading habits, and reading efficiency through measurements of fixation frequency, pause duration, perception time (sum of pause durations), and regression frequency, though he cautioned that additional checks of comprehension were important and that eye-movement alone, while highly valid, should not be the only test of reading efficiency. He noted that speed and comprehension appear to be related. However, because testing of eye-movement was expensive and labor intensive, only small groups had been studied at the time of his research.

During the second era of research, technology was created that included eye-movement photography equipment, pacers, films, and the tachistoscope, a mechanical device which measured eye-movement, resulting in new efforts to create speed reading programs or programs that improved reading efficiency (Williams, 2009).

The third era was initiated in the mid-1970s and was impacted by a surge of new and complex technology that allowed researchers to refine their methods of measuring both saccades and fixations—critical types of eye-movements—through the use of computers and research laboratories (Rayner, 1998). In 2011, Webber, Wood, Gole, and Brown reported on research using the Visagraph III, a device that records eye positions during reading. This technology required goggles worn by 59 students in the study who were checked for reading rates and eye-movements, or saccades. The study verified that slower developmental eye-movement (DEM) corresponded to weaker reading skills because the duration of both fixations and reading rate

determined through technology corresponded to standardized reading achievement scores (Webber et al., 2011).

More recent studies have pursued working memory and processing speed in relation to eye-movements based on the assumption that reading comprehension included language processes in addition to general cognitive abilities of perception, attention, working-memory, and reasoning (Traxler et al., 2012). In Traxler et al.'s (2012) study, results showed that reading speed impacts the reader's progress more than working-memory capacity.

Research also indicated that reading is more complex than the task of decoding letters. As the eye moved across a field of words or symbols, the brain was prompted to make sense of the written word. In the 2012 Journal of Early Childhood Literacy, three researchers studied a second grader's reading pattern and eye-movements, noting miscues and visual behaviors related to each miscue (Brown, Kim, & O'Brien Ramirez, 2012). In addition, it was worth noting that this study demonstrated that readers were not passive but rather were actively engaged in seeking meaning during the reading process (Brown et al., 2012).

In summary, the three eras of research in eye-movement, which spanned from 1879 through 2000, included studies that connected the visual process of scanning words to the absorption of meaning during the reading process. This research confirmed that fluid eye-movements were important to successful reading. This relationship between eye-movement and comprehension connected the critical nature of reading for student success in classrooms. The ability to read was a physical and mental connection that allowed students to process and comprehend reading materials. Monitoring this specific student capability was difficult for teachers to assess through typical classroom instructional methods, interventions and

assessments. The *Reading Plus* program allowed teachers to pinpoint student weaknesses in reading and to target them through successful eye-movement interventions.

National Emphasis on Reading

The United States federal government, through the work of the Department of Education, illustrated a continued commitment to the importance of reading instruction by pursuing research studies that identified best practices and by participating in both national and international assessments that monitored literacy rates of children in the United States. To provide direction, the Department of Education developed the following initiative:

> In 1997, Congress engaged federal agencies by guiding the Director of the National Institute of Child Health and Human Development (NICHD), in consultation with the Secretary of Education, to convene a national panel to assess the status of research-based knowledge, including the effectiveness of various approaches to teaching children to read. (NRP, 2000, p. 1)

The subsequent 449-page report, "Teaching Children to Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and the Implications for Teaching Reading" by the NRP was released in 2000. Specifically, "The National Reading Panel embraced the criteria in its review to bring balance to a field in which decisions have often been made based more on ideology than evidence" (Armbruster, Lehr, & Osborn, 2001, "Introduction," para. 6). The report contained evidence to support specific instructional practices to teach reading. This report was used to shape educational policies, classroom instruction and teaching materials that affected students in classrooms across the nation. Consequently, responses were both positive and negative in nature from organizations such as the International Reading Association, The

Committee on the Prevention of Reading Difficulties in Young Children, The RAND Reading Study Group, The National Literacy Council, and the university research community.

With a sense of respect and specified direction, the public school community including students, parents, teachers and school administrators relied on educational leaders to make sound decisions about the foundations of reading instruction. Educational leaders at the district and state levels across the nation received information from the U.S. Department of Education (USDE) on the best instructional methods to teach reading. Interestingly, USDE "Department officials have continually stressed that there was not any sort of list of 'sanctioned' programs. The critical issue was that any and all reading programs and materials . . . must be based upon scientifically-based reading research as that term is defined in the program statute" (U.S. Department of Education, 2008, "No approved list," para. 1).

Two major documents were published to assist state and local school systems. The *Research Building Blocks for Teaching Children to Read, Put Reading First: Kindergarten through Grade 3* was developed by the Center for the Improvement of Early Reading Achievement and published by The Partnership for Reading, a collaborative effort of the National Institute for Literacy, the National Institute of Child Health and Human Development. The U.S. Department of Education published *Teaching Children to Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and the Implications for Teaching Reading-Reports of the Subgroups* by the NRP of the USDE in 2000. Recently in 2008, the Institute of Educational Sciences (IES) published *Improving Adolescent Literacy: Effective Classroom and Intervention Practices*. These important publications provide exemplars of reading instruction for decision-making based upon rigorous scientifically-based research.

National Reading Accountability

From the implementation of the Goals 2000, the Improving America's Schools Act, it was apparent that states must move towards clear goals, standards, and expectations to address the achievement gap issue (Johnson, 2002).

The work of the NRP paralleled the emerging federal accountability requirements of NCLB. NCLB required states to administer reading assessments at the elementary and middle school levels. These assessments included NC End-of-Grade and NC End-of-Course tests for grades 3–12. High school students participated in subject specific tests such as English I, which included literary devices, literature, comprehension and grammatical structure. United States History and Biology End-of-Course assessments required reading comprehension and vocabulary skills for successful proficiency.

RttT accountability included the same state-wide assessments for elementary and middle schools, but moved the high school assessment to English II in 2011. The RttT accountability measures for North Carolina included a progression scale for schools to reduce the gaps between subgroups or specifically labeled as AMOs. This accountability model merged student scores within a subgroup that was reported within the accountability data for each school in North Carolina. The resulting data highlighted the school as a whole as opposed to individual students within the school. Local state requirements included an A–F labeling system for schools based upon student growth.

Student achievement had been important from the national perspective through NCLB and other national efforts to improve college graduation rates. While attention was given previously to individual student test scores, more recent emphasis focused on groups of student data, which resulted in student sub-group scores as well as a score for the school as a whole.

Foundational Reading Instructional Methods

"Learning to read was a complex task for beginners. They (readers) must coordinate many cognitive processes to read accurately and fluently, including recognizing words, constructing the meanings of sentences and text, and retaining the information read in memory" (NRP, 2000, p. 89).

Five essential components of reading instruction emerged from the research of the NRP and the Partnership for Reading. However, many reading experts contend that reading instruction and competence relied on more than skills, but also on an emotional connection to text. Snow (2002) explained that literacy experts should reinforce reading as an emotional sphere in addition to cognitive. Motivating the reader through a stimulating learning environment through text material and activity would keep the young reader engaged and interested in reading. The NRP encouraged educators to motivate students through engaging classroom strategies and tasks.

The NRP (2000) contended that children should be assessed not only in phonics but also in their interest and understanding of reading material. The panel emphasized that use of all the different reading processes, rather than in only one, would contribute to academic development as students grow in reading skills.

Instructional methods identified by the NRP (2000) included phonemic awareness, phonics, fluency, vocabulary instruction, and comprehension. Designated by the educational community as the "Big 5," educators around the nation began implementing these strategies in classrooms and publishing companies began producing teaching materials. This combination of teaching reading with five core instructional strategies and the importance of motivational factors that sustained a reader's interest provided the educational community with a framework for

instructional reading methods for teachers. The *Reading Plus* program combines the five core instructional strategies through the use of technology and ophthalmology research and administered by a teacher who motivates the students through facilitation of the program.

Phonemic Awareness

Phonemic awareness (PA) instruction was intended "only as a critical foundational piece. It helps children grasp how the alphabetic system works in their language and helps children read and spell words in various ways" (NRP, 2000, 7). The NRP contends that their "results of the meta-analysis showed that teaching children to manipulate the sounds in language helps them learn to read" (p. 5).

The NRP describes phonemic awareness and associated processes as an essential part of reading that assists readers with combinations of sounds that apply to corresponding letters in order to make words.

As students learned to make the sounds of the alphabet by matching an alphabetic letter while moving their mouths, vocal chords and hearing the sounds they create, it strengthens their ability to decode unfamiliar words. This ability to hear a sound and match it to an alphabet letter(s) enabled a young reader to "sound out" letters and spell words that in turn enhances future literacy skills.

Phonics Instruction

The phonics instruction "process for beginners involves learning the alphabetic system, that was, letter-sound correspondences and spelling patterns, and learning how to apply this knowledge in their reading" (NRP, 2000, p. 89). Harris and Hodges (1995) explained that "systematic phonics instruction is a way of teaching reading that stresses the acquisition of letter-sound correspondences and their use to read and spell words" (NRP, 2000, p. 89). NRP

continued that the goal of phonics is to assist the reader to use the alphabet in order to read and write effectively.

The ability of the student to transfer the printed word into its spoken form enables the reader to "decode" the word. Decoding "involves looking at a word and connecting the letters and sounds and then blending those sounds together" (Honig, Diamond, & Gutlohn, 2008, p. 8). The alphabetic principle was reinforced when students understand that "written letters represent spoken sounds" (Honig et al., 2008, p. 8). Phonics instruction helped beginning readers to understand that letters and sounds work together for reading and writing.

Fluency

Fluency skills of a reader may appear to be sufficient to others during the common practices of read-aloud opportunities within classroom settings. As teachers and fellow classmates listen to a classmate read aloud, everyone may be able to discern the smoothness of the voice or the difficulty of the pronunciations. Reading fluency is emphasized by the NRP (2000) with the statement: "[there is] a close relationship between fluency and reading comprehension. Students who are low in fluency may have difficulty getting the meaning of what they read" (p. 1). The NRP included speed, accuracy, strong word recognition skills and proper expression as skills that impacted fluency skills but noted that these components do not always lead to fluency. Fluency was critical so that readers could devote their attention to understanding the meaning of the content instead of identifying the words in print (Florida Center for Reading Research, 2006).

Fluency skills were teachable, yet the methods have been debatable. Many educators contended that practice increases fluency, so reading aloud and frequently were understandable instructional solutions. Procedures such as repeated oral reading practice and guided oral

reading practice and programs such as Sustained Silent Reading, Accelerated Reader and other incentive programs were analyzed for effectiveness by the NRP. The panel noted that these procedures improved sound/word recognition and comprehension, along with the speed and accuracy of the oral reading process, thus contributing to reading achievement. The Florida Center for Reading Research (2006) recommended fluency instruction built upon phonemic awareness, oral reading practice and listening to appropriate reading of others. Based upon the uncertainty of correlational studies, NRP reminded educators that reading practice was important to reading attainment, though stronger readers may read more and continue to improve their reading because they enjoy reading.

Vocabulary

Biemiller and Boote (2006) contended the importance of vocabulary instruction for children who have not been exposed to a vocabulary-rich environment as critical. Biemiller and Boote (2006) stated that "early vocabulary limitations make 'catching up' difficult even though once in school, children appear to acquire new vocabulary at similar rates. To 'catch up,' vocabulary-disadvantaged children have to acquire vocabulary at above-average rates" (Biemiller & Boote, 2006, para. 7).

Vocabulary occupied an important position in learning to read. "As a learner begins to read, reading vocabulary encountered in texts was mapped onto the oral vocabulary the learner brings to the task. The reader learns to translate the (relatively) unfamiliar words in print into speech, with the expectation that the speech forms will be easier to comprehend" (NRP, 2000, p. 7).

With the importance of vocabulary for comprehension and the critical need for students that were not exposed to a rich vocabulary environment, it was imperative for early childhood educators to teach vocabulary words to students on a daily basis.

Comprehension

Comprehension and vocabulary knowledge work together in the reader's mind to create meaning for himself/herself from the text. "Reading comprehension is the construction of the meaning of a written text through a reciprocal interchange of ideas between the reader and the message in a particular text" (Harris & Hodges, 1995, p. 39).

The NRP (2000) explained comprehension as the moments when "a reader reads a text to understand what is read and to put this understanding to use" (p. 5). In addition, the panel noted that comprehension skills were active when the reader could learn, locate information, or even be entertained in order to gain meaningful memories of the reading text and then communicate that information to others (NRP, 2000). Further, comprehension strategies guide the student as he reads and writes so that he is able to understand the text and use the information effectively (NRP, 2000).

Understanding the written text by reading or listening to the text was the culmination of the skills of a literate person. The ability to gain knowledge or skill, to be entertained, or to make a decision was the right of every citizen. The ability to flourish in a democracy as an active citizen was to be literate.

Individualized Reading Instruction

Connor, Morrison, Fishman, Schatschneider, and Underwood (2007), in a report titled "Algorithm-Guided Individualized Reading Instruction," argued that it was important to individualize reading instruction. Connor et al. (2007) addressed the reading methods

controversy by saying that a balanced approach of phonics and whole language was best for a majority of students since use of one single approach, such as only word attach or only whole word method, might only improve the reading deficits only in the children who showed that type of reading problem.

Fortunately, teachers approached how to best teach children to read by studying a variety of researched best practices and use diagnostic tools such as the Woodcock-Johnson III to monitor students' reading proficiencies. According to Stanovich and Stanovich (2003), "reflective teachers use scientific thinking . . . and inquire into their own practice and . . . examine their own classrooms to find out what works best for them and their students" (p. 5).

Reflective teachers may realize that there might not be one single best approach to reading instruction. Many factors should go into teaching children to read. Most often, teachers pre-assessed reading proficiencies and determined methods and strategies that would best suit a child. Kamil et al. (2000) called this an "ecologically balanced or comprehensive approach to teaching reading" (p. 234). He continued by saying that in order to develop the most effective instructional approaches and interventions, we must clearly define what works, "the conditions under which it works," and what may not be helpful (Pearson, 2004, p. 244). Combining different methodologies may be necessary in order to design reading programs that will work with children who have different abilities. Research suggested that using ineffective teaching methods along with instructional strategies that are without "enough research evidence" limit student mastery of essential skills and new concepts (Moats, 2007, p. 8).

The new Common Core State Standards (CCSS) were the culmination of an extended, broad-based effort to create the next generation of K–12 standards to help ensure that all students are college and career ready in literacy no later than the end of high school (Honig et al., 2008).

The hope was that instead of each state having separate standards and in turn separate measures of what a literate high school graduate would learn, all states would require the same things from graduates by following like standards. Gill and Kozloff (2004) stated that "[although] students, regardless of their learning difficulties, reach higher and faster achievement with systematic and explicit instruction, this type of instruction was still not always used" (p. 3).

History of the *Reading Plus* Program

The development of the *Reading Plus* program began in 1931 through the research of Earl Taylor, James Taylor, and Carl Taylor on the connection between eye-movements and reading skills. Their development of the *Ophthalmograph*, an instrument used to photograph the eyes during reading, and the *Metronoscope*, a device that exposed short reading passages to the eyes so that they were exercised to increase binocular coordination, were the foundation instruments that connected reading skills such as fluency to the physical capability of the student's eyes. These instruments were two of the first instruments to be used in reading instruction in the United States (*Reading Plus*, 2013).

In 1945, there were three points of view concerning eye-movement and the reading process. Brandt (1945) and Ahrendt and Mosedale (1971) explained that in 1945 one school of thought contended that poor central processes were due to poor eye-movement. Another group believed that eye-movement determined the cognitive processes and the third group simply acknowledged that there was a functional relationship between ocular movements and cognitive processes.

Continuing the research of the correlation of the strengthening of the student's eye coordination with reading, Stanford E. Taylor founded Educational Developmental Laboratories, Inc. (later EDL/McGraw-Hill) and invented the Reading Eye I Camera. He contended that eye-

movements were not the reflection of poor reading, but were part of the "individual's functional and interpretative development" (Ahrendt & Mosedale, 1971, p. 149). With the ability to photograph eye-movement during reading, Taylor felt that it was important to use this diagnostic method to develop individualized reading programs for struggling readers.

Mr. Stanford Taylor continued his research by conducting a large-scale eye-movement study with 39 colleges and university students. He produced the *Look, Listen, Learn* system of beginning reading and the Learning 100 system for adult learners. His systems used his invented instructional devices including the *Aud-X*, the *Controlled Reader*, and the *Tach-X Tachistoscope* (*Reading Plus*, 2012). His development of the *Guided Reader*, a simplified controlled reading device, the Tach-Mate tachistoscope, and the Apple® version of the *Visagraph*®, a computerized eye-movement recording system infused new technologies. In 1995, Taylor Associates/Communications, Inc. launched the first versions of the *Reading Plus* program. Subsequent research and development led to the 2002 web-based version of the RP program. Under the direction of CEO, Mark Taylor, the company recently released the 2013 version of the *Reading Plus* program that included a writing component (*Reading Plus*, 2012). The *Reading Plus* program's goal was to increase a student's fluency and silent reading, comprehension, vocabulary, and overall reading proficiency for students in Grade 3 through college.

***Reading Plus* Program Instructional Methods**

The *Reading Plus* program followed the premise that eye-movements or visual-perceptual skills impacted reading so many of the components of the RP methodology included eye exercises and repetition. Visual-perceptual skills were the ability to interpret or give meaning to what is seen (Glossary of *Reading Plus*, 2012). The student began the process by taking a *Reading Placement Appraisal* (RPA) to determine his/her practice level for each part of

the program. The RPA determined the student's independent silent reading rate, independent silent reading level, and instructional vocabulary level. Another pre-assessment option is the use of the Visagraph, a tool that detects the student's binocular abilities by tracking the student's eye-movements across text.

Once the pre-assessment process was completed, the RP program followed a routine process of activities. The warm-up activity was called *PAVE,* Perceptual Accuracy/Visual Efficiency. The "scan and flash" activities increased visual memory by building visual skills and by training students to recognize letters and numbers accurately and instantly. *Scan* required students to scan and count the visible characters as they moved across the screen. This activity increased students scanning rate and skills such as "visual coordination and directional attack, visual discrimination and instant recognition" (Glossary of *Reading Plus*, 2012, p. 1). *Flash* required students to view a set of "flashed" characters and then they typed what they saw as quickly as possible. PAVE built basic skills necessary for fluent and efficient reading and improved spelling.

Guided Reading™ was the major component of the RP program that enabled students to practice their silent reading in an efficient manner. Students had the option to select a story, which they read within their independent and/or guided rate formats. The independent rate was self-paced yet timed. The student read the sentence and clicked to add the next line of text. The guided rate was the student's silent reading rate. The program used a technique in which the software had a "window" that moved across the text on the screen to direct the student's eyes. The speed of the window increased as the student's comprehension skills increased. The Guided Reading exercises reinforced key vocabulary and the student must answer comprehension questions within 80% accuracy to improve their level.

The primary goal of the *Cloze Plus*™ activity was to provide students with a wide variety of contextual analysis experiences and comprehension building lessons. The focus on surrounding text increased the student's ability to use context to predict and infer for greater comprehension.

Reading Plus methodology included four critical components that were described as *Keys to success with the Reading Plus program*. The components included: following an intense schedule of three to five times per week; 45-minute sessions in a lab environment; extrinsic motivation rewards and recognition; adequate computer workstations; student monitoring by the teacher through one-on-one encouragement, and individual program adjustments.

Students, teachers and administrators received individual, class and site level reports that monitor their performance levels according to the program assessments. The program built in an award system that recognized growth in student performance and the opportunity for teachers to send positive messages to students. Many teachers also used small rewards to supplement the built-in award system.

Taylor Associates/Communications, Inc. developed other tools to support students that were included within the available program components. A writing component, vocabulary activities without the computer, and teacher-directed lessons were included to support students who were not successful on the computer. *Reading Plus* incorporated the understanding and research from their founders in 1931 to the present instructional online system that monitored students individually and provided each student with personally designed reading support. Research (Connor et al., 2007) claimed that individually designed reading instruction was critical for student success.

Reading Plus was listed in the What Works Clearinghouse (WWC), a component of the United States Department of Education Institute of Education Sciences. The Institute issued an *Adolescent Literacy Intervention Report* stating that the program "demonstrates the system has 'a statistically significant positive effect' on adolescent learners' reading comprehension" (Institute of Education Sciences, 2008, p. 1). The attributes of reading instruction methodologies promoted by the NRP (phonemic awareness, phonics, fluency, vocabulary instruction, and comprehension) were included within the RP program with the addition of the physical intervention support for binocular eye-movement structures and motivational strategies.

Current Reading Initiatives

Key components of reading were regularly noted in the literature and included phonemic awareness, phonics, fluency, vocabulary and comprehension (Honig et al., 2008). These five essential skills were based on recommendations of the NRP (2000) regarding research-based reading skills in the report of the NRP: Teaching children to read (NRP, 2000).

With the *Reading First* initiative, *No Child Left Behind Act of 2001*, *Common Core* curriculum, and increased test requirements, more effort was placed on the targeting of early readers. Though it was generally accepted that reading deficits should be addressed at the earliest level, a review of programs for beginning readers through the What Works Clearinghouse (WWC, 2010) was conducted to determine which programs and interventions were supported by scientific evidence of effectiveness; however, the findings yielded limited evidence. One hundred fifty-three programs were reviewed by the WWC, although only 11 were found to have sufficient evidence of effectiveness in at least one or two of the five domains noted as essential aspects of reading by the NRP (2000).

Through the more recent Response to Instruction (RTI) model which called for a tiered process of intervention to address academic or behavioral needs of students, the Rose Report (Rose, 2006) recommended a second tier of intervention before reading failures became significant. Rose cited a longitudinal study in which phonics was effectively taught when using a synthetic approach of teaching sounds in association with the corresponding letters (Rose, 2006). When students recognized letters and their corresponding sounds, they were taught to put more letters together in order to read a word by sounding out the phonemes. Gersten and Dimino (2006) reported that it was difficult to identify struggling students during the first year of school, thus noting that special education students may be either over-identified or under-identified during this time period in kindergarten or first grade. While a discrepancy between IQ and reading achievement tests was the prior identification requirement for learning disabilities in the area of reading, the newer process of RTI provided teachers with a framework for making data-based decisions before referring a child to special education evaluation, RTI allowed teachers to provide accommodations and small group interventions for students who may not be able to respond to the typical classroom instruction (Gersten & Dimino 2006).

Literature regarding *Reading Plus*, a web-based intervention program that focused on reading fluency, comprehension, and vocabulary, included a study of eye-movement in relation to reading and the reading rate of students with reading problems or disabilities in a group of 13,128 students in grades five through nine. In the 2008 study, technology was used to assess student reading levels, as well as provide reading activities via the computer that were complemented by supplemental offline activities. WWC (2010) noted that *Reading Plus* had potentially positive effects with regard to comprehension.

Taylor Associates, the company that created *Reading Plus*, noted that it was founded on research and development in the field of silent reading technology and has documented success in increasing standardized scores through gains in fluency and silent reading, comprehension, vocabulary, and overall reading proficiency for students in grade 3 through college (*Reading Plus*, 2012).

The combination of both eye-movement research and reading intervention practices used in *Reading Plus* resulted in a unique approach to improved silent visual reading skills through more fluid eye-movements that allowed for sustained comprehension. *Reading Plus* methodology contained structures to scaffold content, rate, repetition intensity and lesson formats to build independent reading skills (*Reading Plus*, n.d.).

Assessing Reading

In 2000, the NRP produced a report for Congress focused on the five essential components of reading instruction that were intended to prevent reading failure (Honig et al., 2008). In some instances students continued to fail. According to Torgesen (1998), early assessment was one of the best ways to prevent the downward spiral of failure in reading. Early assessment served to identify students who needed extra help in reading before they experienced serious failure. Torgesen (1998) claimed educators must "catch them [students] before they fall" (p. 32).

Stanovich (1986, 1993) continued to emphasize the importance of early reading assessments in what he called the *Matthew Effect.* His theory stated that students who learned to read early continued improving but that students that did not learn to read early continued to struggle and "become 'poorer' and increasingly distanced from the students 'rich' in reading ability" (Stanovich, 1986, p. 380).

Scientifically-based research studies have repeatedly demonstrated the value of regularly assessing students' reading progress (e.g., Fuchs & Fuchs, 1999; Shinn, 1998). The implementation of the No Child Left Behind Act of 2001 (NCLB) caused many states to reexamine their accountability models and thus revamp their curricula and testing (Dennis, 2009). For example, Tennessee revised its assessment program implementing a criterion-referenced standardized assessment measuring the student's proficiency on the content standards in grades three through eight (TCAP). The Tennessee Reading Policy required a direct reading instruction using scientifically-based reading research that includes the five elements of reading (Dennis, 2009).

The Tennessee State Board of Education's policy required these scores to be used to make instructional decisions about the students (Tennessee State Board of Education, 2005, p. 4). The scores reflected the level of mastery on the grade-level content but did not reveal why these students were testing below grade level (Dennis, 2009). This phenomenon illustrated the challenges that school administrators and teachers faced when trying to use state mandated assessments such as criterion-referenced exams to provide reading instruction that was personalized for students.

In order to effectively meet the needs of students who struggle with reading, Moore County Schools relied on a variety of assessment tools such as formative, benchmark, and summative assessments along with progress monitoring weekly on targeted skills to ensure adequate progress and student learning in the analysis of student reading skills (Moore County Schools, 2012). Each of these tests identified students at risk of reading issues and resulted in information for teachers to provide support and progress monitoring (Honig et al., 2008).

Specific diagnostic assessment identified specific weaknesses while outcomes-based assessments evaluated overall skills (Honig et al., 2008).

The research was consistent in explaining the five domains/skills (phonemic awareness, phonics, fluency, vocabulary, and comprehension) possessed among successful readers (NRP, 2000). Some of the domains narrowed even further into subcomponents. All of these components and their subcomponents must be understood and measured through ongoing observations so that effective instructional interventions can be individualized to each reader who was experiencing difficulty in one or all of the five domains. Even subtle changes in the components are important to observe so that modifications to the instruction met the specific needs of the student to insure the continued growth of the reader (Leslie & Caldwell, 2005).

In order to implement appropriate targeted interventions, it was necessary to understand the various key assessments which follow.

Reading Plus assessed students on an interim basis throughout the period of intervention including a Universal Screener, Placement Test, Silent Reading Eye-Movement Recording Assessment and Benchmark Assessments which provided teachers with an analysis of a student's motivation, reading efficiency and capacity. The Universal Screener assessed students for reading proficiency and determined which students would benefit from silent reading intervention. Placement tests determined student's initial placement and assignments. Benchmark Assessments assisted teachers as they monitored student progress over time in reading efficiency, capacity and motivation. The Silent Reading Eye-Movement Recording Assessment uses the Visagraph, eye-movement recording device to detect visual or perceptual processing deficiencies. The results of the interim assessments created an individualized and

responsive program with personalized goals that provided teachers with information and resources to meet individual student needs (*Reading Plus*, n.d.).

Motivating Readers

Researchers Kirsch et al. (2000) reported that students' interest in reading was a predictor of reading comprehension and that 37% of all students surveyed did not read for enjoyment. Additionally, the research of Ivey and Broaddus (2001) shared that independent reading decreases during the middle school years. Researchers Guthrie, Schafer, and Huang (2001) reported that high motivation to read impacted reading achievement even more so than socioeconomics and family background. More specifically researchers Cox and Guthrie (2001) as well as Wang and Guthrie (2004) showed that intrinsic versus extrinsic motivation was more closely associated with reading comprehension. Ivey and Broaddus (2001) also shared that motivating adolescent readers was not a simple task; in fact, it was multidimensional. Furthermore, they shared that teachers expect students to read critically, as well as independently, while instructional practices do not support these expectations. Teachers seldom allowed students to initiate conversations about reading texts or gave them limited opportunities to pursue their own reading interests.

Gambrell (2011) discussed seven ways to engage students in reading: make the tasks relevant to students' lives, give students access to a wide range of reading materials, give students sufficient time to read, give students choices in what they read and their tasks, give students time to talk with their peers about what they read, make reading challenging but successful, and provide incentives that value the importance of reading. Technology was also a motivating factor for some students who struggled with reading; however, the research appeared to be inconclusive. The research of Grimshaw, Dungworth, Mcknight, and Morris (2007) did not

show a significant impact on the reading comprehension of students who used electronic texts while Ertem (2010) reported that electronic texts did have a positive impact on reading comprehension. Marinak and Gambrell (2008) summed it up best when they stated that carefully selected rewards worked best in increasing reading motivation.

The current research showed that responsive and individualized instruction yielded a higher growth in reading than a more generalized approach (Connor et al., 2007). Many of these strategies overlapped and used blended approaches and applications. These blended approaches impacted the students' interest and motivation in what they were reading and also had a significant impact on their vocabulary acquisition, comprehension, and overall increase in their reading skills. There was a great deal of research on reading intervention strategies for K–5 children (Armbruster et al., 2001, Biemiller & Boote, 2006; Connor et al., 2007) but as Vaughn et al. (2008) reported there was very little research in regard to six to 12 students who were experiencing difficulty in reading comprehension.

The NRP (2000) reported that far too many students, in general, were not adequate readers. Biancarosa and Snow (2004) stated that struggling readers in intermediate grades performed below proficiency in both word reading skills and comprehension. Hock et al. (2009) concurred that by the time these struggling readers reached the high school level, many demonstrated deficits in comprehension, word reading, fluency, and vocabulary.

Reading Plus provided an intrinsic motivation connection for students as they progressed during the intervention. Goals, badges, teacher notes and progress were continually shared with the student through the *Reading Plus* format and teacher facilitation. The program claimed that student confidence and interest would increase as he/she demonstrated mastery (*Reading Plus*, n.d.).

The Challenge for Older Readers

Once students reached the secondary level in school, they were expected to read at the appropriate level or "read to learn" instead of "learn to read" as they did in elementary school. Unfortunately, some sixth-grade students entering middle school were not prepared to read proficiently at the secondary level. Specific reading instruction was not continued at the middle and high school levels so struggling reading students did not receive specific intervention strategies to support his/her individual needs. Consequently, these students continued to struggle with reading throughout their secondary school careers, which was a critical concern for educators and parents (Schatschneider et al., 2004; Torgesen, Nettles, Howard, & Winterbottom, 2005). Researchers Rasinski, Rikli, and Johnston (2009) noted a correlation between fluency and a standardized assessment of silent reading comprehension for elementary and middle grade students that emphasized the importance of fluency during the reading process. Similarly, Rasinski et al. (2005) commented that there was a high correlation between a high school student's comprehension and silent reading fluency proficiency.

Current state-level standardized testing practices in North Carolina required students (testing modifications were provided if noted on an exceptional education student's Individualized Education Plan or a health-impaired student's 504 plan) to read silently in order to complete his/her NC End-of-Grade or Common Exam testing requirements in grades three through 12. Unfortunately, if the student was not proficient in reading fluency then there was a high risk of a lack of comprehension and failing the standardized assessments (Buck & Torgesen, 2003; Roehrig, Petscher, Nettles, Hudson, & Torgesen, 2008). Incidentally, exceptional education students that are identified as *reading disabled* are not permitted to receive the *read aloud* modification for their NC End-of-Grade English Language Arts assessments

which contained long reading passages with comprehension questions. The *read aloud* testing modification permitted an adult to read the test passages out loud for the student.

Research (Armbruster et al., 2001; Burke & Rowsell, 2007; Dennis, 2009; Reutzel, Petscher, & Spichtig, 2012; Snow, 2002; Woods, 2007) indicated that practitioners wanted to know a specific instructional methodology that would assist struggling readers. In the quest to discover the best methods, a multitude of approaches of reading instruction and interventions emerged from different associations to the national level (Brown et al., 2012; Cheung & Slavin, 2012; Guthrie & Davis, 2003; Kamil et al., 2000). The NRP (2000) has not promoted any particular method of reading instruction over another. Methodologies included critical details of physical supports concerning eye-movements, hearing, speech abilities and cognition (Lyon et al., 2003). Because secondary teachers were not trained in reading methodologies, current instructional strategies for fluency at the secondary level typically included oral reading which was time consuming, permitted only one student at a time to read for the group, was distracting for some students, and created embarrassing situations for struggling readers at the secondary level.

A critical need for continued fluency support at the secondary levels was noted by researchers (Rasinski, Padak, Linek, & Sturtevant, 1994; Rasinski & Stevenson, 2005; Stahl & Heubach, 2005) which found positive effects for fluency instruction on students' word recognition, reading fluency, comprehension, and overall reading achievement. Researchers (Buck & Torgesen, 2003; Roehrig et al., 2008) shared that there was a direct correlation between third graders' fluency skills and success on standardized tests. While this was the case, there was not a focused continued instructional support for fluency proficiency past the elementary school. Typical middle and high school classrooms teachers monitored fluency as the ability to read

aloud with *prosody*, the ability to read with intonation, expression and inflection, which was not an accurate indicator of comprehension. “Repeated and monitored oral reading” was cited as a valuable practice to improve reading fluency (Armbruster, Lehr, & Osborn, 2001, p. 24).

The history of teaching reading confirmed that there was no consensus among reading experts as to the best method to teach children to read. Teaching reading was a difficult endeavor. Elementary students faced many social and motivational hurdles. The discrepancy between educators understanding fluency instruction at the middle and high school levels and reading comprehension demonstrated a neglect of reading instructional strategies in many classrooms. A more rigorous high stakes testing program based upon Common Core State Standards (RttT, 2013), which increased the requirement of students’ comprehension and silent reading fluency and the absence of clear individualized reading instructional practices at the secondary level, created a need to use an individualized reading support system such as *Reading Plus* to support struggling readers at Cameron Elementary, New Century Middle, and Pinecrest High school in the Moore County Schools district.

CHAPTER 3: METHODOLOGY

Research Purpose

The purpose of this study was to determine the effectiveness of the *Reading Plus* reading intervention system used in three schools in the Moore County Schools in North Carolina with regard to student reading achievement. Due to the continued budget crisis of 2010, coupled with the implementation of the Common Core Curriculum in 2012 and the increased pressure from *Race to the Top* requirements in 2013 to reduce the achievement gaps, school administrators searched for instructional tools and strategies with the potential to improve student achievement for all students. Some elementary schools applied Title I funding while other administrators exhausted state instructional budgets for promising supplemental programs. District administrators supported the quest by school administrators to identify reading support for students who were struggling in reading through partial funding to a school that was seeking an effective reading program.

Pinecrest High School (PHS) piloted the *Reading Plus* system in 2008–2009 and continued the implementation while New Century Middle School (NCMS) piloted the system in 2010–2011 and Cameron Elementary School began its pilot year of *Reading Plus* in the 2012–2013 school year. *Reading Plus*®/Taylor Associates, the company that created and sold *Reading Plus*, provided the program at no charge for these three schools for the pilot year. In addition, Pinecrest High School continued the program at no cost to the school or district for the first three years.

Pinecrest High School implemented the program with three teachers, two of whom were English teachers and the third was a teacher of Exceptional Children. One teacher had previously implemented the *Reading Plus* system while teaching in another state. The company

representative Greg Taylor provided training to all three PHS teachers during the first year of implementation. Language Arts (ELA) teachers at NCMS received introductory training in the fall of 2010 from the *Reading Plus* representative, and a follow-up session with teachers from Pinecrest High School (PHS) who had successfully implemented the program at the high school level through teaming in a *Reading Plus* class. The NCMS ELA teachers used *Reading Plus* as supplementary support for their students, but it was not implemented with fidelity in 2010–2011. Dr. Kathy Kennedy, an assistant superintendent with Moore County Schools, said that, according to the National Center on Response to Intervention, "Fidelity of implementation was defined as the delivery of content and instructional strategies in the way in which they were designed and intended to be delivered; accurately and consistently." Implementation of the program with fidelity was essential for students to show the greatest gains using the program. Dr. Kennedy further explained,

> When a program was not implemented with fidelity, an implementation gap occurs resulting in diminished outcomes. Fidelity of implementation results in the proper execution of the specific research-based practices within the program. When these research-based practices were fully implemented, we can expect positive student achievement outcomes. (K. Kennedy, personal communication, October 16, 2013)

Natalie Cook, reading consultant to the Moore County Schools, advised the elementary schools in Moore County by saying, "Once a school selects a research-based educational program, the expectation must be to fully implement the program as it was written so as to get the intended results. High fidelity was critical to reach the desired outcomes. Leadership was at the core of effective implementation" (N. Cook, personal communication, October 16, 2013).

In 2010–2011, the PHS teachers designed a 90-minute English/Language Arts class in which selected ninth-grade students received 45 minutes of direct instruction in ELA from one teacher and 45 minutes of *Reading Plus* intervention with support from the second teacher. These teachers implemented *Reading Plus* with fidelity according the *Reading Plus* implementation guide. Pinecrest High School continued this 90-minute model throughout the 2012–2013 school year.

Statement of Problem of Practice

The acquisition of reading skills by K–12 students may be essential to academic and career success because reading is required for academic tasks, as well as daily adult activities. School-age students who do not read well may have more difficulty with both academic assignments and reading for pleasure. As adults, these same students with weak reading skills may also experience difficulty following written directions or reading a newspaper. Career-oriented reading may require the worker to read and comprehend complex documents. Therefore, students who are successful in reading may be more likely to find success in adult life activities that involve both personal reading and career-related reading.

Previously in the school district involved in this study, Moore County Schools district level administrators allowed school principals and faculties to select reading programs based upon their own student needs and budgets. Program selections varied by training, implementation, and fidelity. This selection process resulted in a list of at least 13 different reading programs in 23 schools across the district. In addition, as more reading programs were purchased and as data became more important, the district administration began requiring schools to provide a streamlined evaluation of the implemented program, including data results for groups of students and the school population as a whole, in response to RttT requirements

and methods of monitoring achievement data. Superintendent Dr. Aaron Spence expected schools to provide data showing that their selected intervention programs were effective for the purpose of improving students' reading. For streamlined evaluation, each school provided pre and/or post data using scores or information the school deemed important to its purpose. This study sought to provide a review of reading scores, Lexile levels, and teacher information regarding implementation of the *Reading Plus* program and fidelity to implementation in order to produce a more thorough result. Though data regarding achievement gaps among groups may have existed, for the purpose of this study, achievement gaps were not examined.

The district superintendent requested the evaluation of reading programs to determine whether or not data supported the current programs, whether or not these programs improved student achievement and, particularly, proficiency in reading. This study focused on the impact of *Reading Plus* on student reading achievement in elementary, middle, and high school, so that information was gleaned to provide an objective view of student academic progress in reading. Three schools were included in the study: Cameron Elementary School, located in rural northeastern Moore County, with 242 students; New Century Middle School, a rural school in central Moore County with 550 students; and Pinecrest High School, in southern Moore County serving 1,982 students, according to 2011–2012 data (NCDPI, 2012b).

Stakes were higher than ever before because of state and federal testing requirements (U.S. Department of Education, 2004b; Common Core State Standards; 2012b, North Carolina General Assembly, 2011). In addition, because of the budgetary and curricular concerns about intervention programs, this specific study assisted the Moore County Schools in making decisions about the *Reading Plus* program and which levels or students, if any, should receive the program instruction. Data released by the NCDPI for 2011–2012 indicated that students at or

above proficient in Moore County were at the 74.7% level. At Cameron Elementary School, third-grade students scored 71.3% proficient in 2010–2011 and 70.4% for 2011–2012. Both of these scores were below the district-wide average of 74.7%. At New Century Middle School, 2010–2011 data revealed student scores at or above proficient as 80.5%, as well as 2011–2012 reading proficiency for New Century at 77.8%. At Pinecrest High School, reading proficiency based on North Carolina English 1 EOC was 89.7 in 2010–2011 and 89.6% in 2011–2012. Despite the fact that scores from these three schools averaged at or above the MCS average, each school still served students who did not read at the expected proficiency level and were, therefore, in need of reading remediation.

Based on the study design, five questions are pertinent to this research:

1. To what extent, if any, did the *Reading Plus* program impact student academic achievement in reading for those students enrolled in the program in grades three through five based on the student Lexile scores generated from the Scholastic Reading Inventory (SRI)?
2. To what extent, if any, did the *Reading Plus* program impact student academic achievement in reading for those students enrolled in the program in grades six through eight based on the student Lexile scores generated from the Scholastic Reading Inventory (SRI)?
3. To what extent, if any, did the *Reading Plus* program impact student academic achievement in reading for those students enrolled in the program in grade nine based on the student Lexile scores generated from the Scholastic Reading Inventory (SRI)?

4. To what extent, if any, did the *Reading Plus* program impact student academic achievement in reading for students with disabilities enrolled in the program based on the student Lexile scores generated from the Scholastic Reading Inventory (SRI)?

Based on perceptions of teachers, it was believed that *Reading Plus* improved all or most students' reading abilities, which, in turn, impacted NC End-of-Grade test scores. This program evaluation of the *Reading Plus* program was intended, in part, to prove or disprove this perception based on the use of pretest and posttest comparison data.

Design of Study

Due to the nature of this study, it was determined that a program evaluation method was the best design to use in determining the effectiveness of the *Reading Plus* program. A program evaluation is a systematic method for collecting, analyzing, and using information to answer questions about projects, policies, and programs, particularly about their effectiveness and efficiency. In both the public and private sectors, stakeholders want to know whether the programs for which they are funding, implementing, voting, or supporting are producing the intended effect and/or results.

While program evaluations were a relatively recent phenomenon, the process of planned social evaluation dated as far back as 2200 BC (Shadish et al., 1991). Evaluation became particularly relevant in the United States during President Lyndon Johnson's "Great Society." Large amounts of money were invested in social programs, but the impact of those investments was largely unknown. Reading intervention programs may have been selected by and used in schools without significant research or study of the reading data that resulted from use of the programs.

This study of the *Reading Plus* program followed a research design pioneered by Daniel Stufflebeam called Context-Input-Process-Product (CIPP). Along with his work on the CIPP, Stufflebeam initiated the development of the program evaluation standards in 1975. These standards were developed for evaluators and other audiences to judge the overall quality of an evaluation. Stufflebeam also served multiple years as director of the Joint Committee on Standards for Educational Evaluation (Fitzpatrick et al., 2011). Stufflebeam's model provided researchers with a framework with which to address the *Reading Plus* program evaluation. This model indicated the need for program evaluations to determine the effectiveness of programs. This process began by making decisions about an area of need, implementing activities to address an area of need, and evaluating the activities that have been implemented (see Appendix A).

Researchers determined that this model would accurately provide information to stakeholders or organizations. In this case, the CIPP model provided Moore County Schools with a program evaluation of the *Reading Plus* program. Stufflebeam had been an influential proponent of a decision-oriented evaluation approach structured to help administrators make good decisions (Zhang et al., 2011). He defined evaluation as the following:

> the process of delineating, obtaining, reporting and applying descriptive and judgmental information about some object's merit, worth, probity, and significance to guide decision making, support accountability, disseminate effective practices, and increase understanding of the involved phenomena. (Stufflebeam, 2005, p. 61)

This program evaluation delineated the *Reading Plus* program in Moore County Schools. Also following Stufflebeam's cycle, researchers obtained pertinent information about the program and provided stakeholders with findings (see Appendix B).

Stufflebeam's definition has evolved over the years and his most recent analysis emphasized the importance of judging the merit and worth of a program. The CIPP model has maintained the endurance beyond other early evaluation models (Fitzpatrick et al., 2011). The principles of the model, a focus on serving decisions in addition to judging merit and worth, have remained constant. The focus of the CIPP model has traditionally targeted program improvement. Stufflebeam (2004) wrote, "Evaluation's most important purpose is not to prove but to improve" (p. 262).

Stufflebeam developed a framework to serve managers and administrators facing different types of decisions. The *Reading Plus* program evaluation focused on the product evaluation component of the CIPP model. The product evaluation component, as stated by Stufflebeam, was intended to assist administrators when determining whether or not a program should be recycled. What should be done with the program after it had run its course? Should it be revised? Expanded? Discontinued? (Fitzpatrick et al., 2011). Based on the results of this program evaluation, the information may be used to provide system officials with data for decisions regarding the *Reading Plus* program.

CIPP Product Evaluation

The purposes of product evaluation were to relate outcomes to objectives and to assess the overall worth of a procedure in terms of its effects. An advantage of the CIPP model was that it allowed the program evaluators to think of evaluation as cyclical, rather than project based (see Appendix C). This model provided evaluators the flexibility to evaluate a program in stages depending on the needs of the stakeholders (Alkin & Christie, 2004).

Although the context, input, and process of the *Reading Plus* program were critical depending on the stage of a program, administrators in the Moore County Schools wanted to

know more about the product of the program. Specifically, administrators sought valid information regarding whether or not the program improved reading achievement for those students enrolled in the program based on student Lexile scores which were generated from the SRI.

The *Reading Plus* program evaluation using the CIPP model consisted of three steps initially theorized by Stufflebeam and focused on the product of the targeted program. The first step was *delineating*, which involved assessment of the *Reading Plus* program based on program expectations by administrators in the Moore County Schools. Dr. Aaron Spence, Superintendent of Moore County Schools, expected reading intervention programs, including *Reading Plus*, to improve student reading achievement.

The second step in the evaluation process was *obtaining*, which resulted when product information was obtained through both interim and final measures of data from those students who were enrolled in the *Reading Plus* program and by analyzing responses of teachers to survey questions. With regard to student products, Lexile scores were recorded at two benchmark periods. The first period was before students began the program at the beginning of the school year (August) and the second period was at the point of exit from the program at the end of the school year (June). With regard to the teachers' products, results were gleaned from surveys that were completed by classroom teachers who facilitated *Reading Plus*. A survey was used to gathered qualitative data of observable actions of teachers who facilitated the *Reading Plus* program. The survey results were intended to document the behavioral responses of students to the program as well as the professional opinions of the teachers regarding program implementation and training. The qualitative data were intended to support, clarify and/or explain the quantitative results. Survey data included at least one teacher from each grade level

in the program from each study site, including three teachers from the elementary school, eight teachers from the middle school, and three teachers from the high school. The results were provided to the stakeholders.

The third step in the evaluation process was *providing.* Varying degrees of information and data from the Reading Plus program evaluation were provided to decision makers.

Research Setting

The research was conducted in three schools in the Moore County Schools district in North Carolina. The Local Education Agency (LEA) is located 60 miles south of Raleigh, North Carolina in the rural Sandhills region. In 2012, Moore County Schools had a student population of 12,463 students in 23 schools. Of this number, there were 5,573 elementary school students, 3,022 middle school students, and 3,868 high school students. The demographic makeup of students enrolled across the district were 66% white, 19% African American, 9% Hispanic, and 6% other races. The percentage of students in Moore County qualifying for free and reduced lunch was 46%.

This study explored the impact of the *Reading Plus* program on student reading achievement for the students who attended Cameron Elementary School, New Century Middle School and Pinecrest High School. Research involved 30 students and three teachers at Cameron Elementary School, 227 students and eight teachers at New Century Middle School, and 174 students and three teachers at Pinecrest High School. These schools were selected for this study at the request of Superintendent of Moore County Schools, Aaron Spence. They were selected because of their intense and continued involvement with the *Reading Plus* program (see Appendix D).

Study Participants

Teachers participated in the study. Participating teachers were those that had specifically implemented the program at one of the three studied schools. Student data originated from test results by students who participated in the *Reading Plus* Intervention program and whose enrollment resulted in data for at least one semester or one full year. Students who were not enrolled in the *Reading Plus* Intervention program were not included. Students who were in the program but did not yield data for one full semester or one full year of intervention were excluded. No student names were used and students were not identifiable by data.

Students at Cameron Elementary were selected for participation in the *Reading Plus* program using criteria that included the previous year's standardized reading test scores, M Class data which determined at-risk status, and the Reading Counts pretest that yielded calculated student Lexile levels. Through initial assessment at Cameron Elementary, M Class assessments were implemented in January 2012 and given to students twice, first as pretest and second as a posttest. Beginning in the fall of 2013, M Class assessments were given at the beginning of the year, at midyear, and at the end of the year. Students were deemed to be above, at, or below grade level based on these scores. Students who scored below grade level on M Class assessments received targeted interventions at least every ten days.

Elementary student data were analyzed and students were placed into the *Reading Plus* program by the team composed of the school principal, the district instructional coach, and the school instructional coach. The district coach was responsible for all district elementary schools and her primary responsibility was literacy and literacy intervention programs. The district coach had access to all school level data. The school instructional coach was also a new position and was responsible for promoting literacy at the school level, including assisting classroom

teachers with literacy implementation and interventions. The school instructional coach monitored all literacy interventions on the school level and offered suggestions to classroom teachers on additional interventions that could be put into place based on data and student performance. The criteria for inclusion in the *Reading Plus* program as determined by the school principal, the school instructional coach, and the district instructional coach required that students score in the high range of level two or the low range of level three in order to be included in the *Reading Plus* program.

Students at New Century Middle School were selected to participate in the *Reading Plus* program based upon the previous year's NC End-of-Grade (EOG) data. Students were included if they scored on the NC Reading EOG high level 1, level 2, or low level 3 (see Table 2). Lexile levels were included if they scored below grade level (see Table 3) and also received teacher recommendation based upon classroom observations.

Students at Pinecrest High School were selected based upon the previous year's NC End-of-Grade (EOG) data. The eighth-grade test scores of students entering the ninth grade were analyzed and students that scored at Level I or Level II were selected for inclusion into the *Reading Plus* program (see Table 2). The Scholastic Reading Inventory (SRI) was an assessment administered to students and a component of the Scholastic reading program adopted by Moore County Schools. The SRI measured student reading comprehension and assigned a Lexile score for each student based on performance on the assessment. In addition, student proficiency on North Carolina End-of-Grade standardized reading tests was determined using scale scores. Lexile scores were reported on the standardized test results (MetaMetrics, Inc., 2008). A score at Level three was considered a passing score or an indication of reading proficiency. For the 2011–2012 school year NCEOG achievement level ranges (NCDPI, 2008)

Table 2

Achievement Level Ranges for the North Carolina End-of-Grade Tests Reading Comprehension at Grades 3–8

Subject/Grade		Level I	Level II	Level III	Level IV
Reading (Starting with the 2007–2008 school year)	3	≤ 330	331–337	338–349	≥ 350
	4	≤ 334	335–342	343–353	≥ 354
	5	≤ 340	341–348	349–360	≥ 361
	6	≤ 344	345–350	351–361	≥ 362
	7	≤ 347	348–355	356–362	≥ 363
	8	≤ 349	350–357	358–369	≥ 370

Note. HSP-C-018, October 2, 2008.

Table 3

Lexile Measures by Grade

Grade	Reader Measures, Mid-Year 25th–75th Percentile (IQR)
1	Up to 300L
2	140L to 500L
3	330L to 700L
4	445L to 810L
5	565L to 910L
6	665L to 1000L
7	735L to 1065L
8	805L to 1100L
9	855L to 1165L
10	905L to 1195L
11 and 12	940L to 1210L

Note. MetaMetrics (2013a).

were as follows in Table 2. Lexile levels as measured by the Scholastic Reading Inventory were as follows in Table 3.

School Demographics

The Moore County Schools (MCS) in North Carolina, a school system of 12,463 students (2012 data), is located approximately 50 miles southeast of Raleigh in the Sandhills region of North Carolina. The school system, divided into 23 schools, served grades Pre–K through 12. Within the 23 schools, 14 were elementary with a population of 5,573 students, five middle schools with a population of 3,022 students, and three high schools and one alternative school with a combined population of 3,868 students. Of these 12,491 students, 19% were African American, 9% Hispanic, 66% White, and 6% were categorized as Other. Forty-six percent of the system's students (2012) qualified under federal guidelines for free or reduced lunch. The Moore County Schools system employs 1,002 certified staff with 46.7% holding master's degrees or higher (Moore County Schools, 2013).

The elementary school included in the study was located in Cameron, North Carolina. There were 242 students enrolled at Cameron Elementary School in grades K–5. The demographic population at Cameron Elementary was 73.7% white, 10.3% African-American, 9.9% Hispanic, 2.5% American Indian, and 3.7% Multiracial. The Cameron Elementary School component of this study involved the analysis of data from fourth- and fifth-grade students who were enrolled in the *Reading Plus* reading intervention program over a nine-month period. The percentage of students who qualified for free and reduced lunch was identified as 65%. Free and reduced lunch status was the determining factor in schools designated as Title I by the United States Department of Education so Title I designated schools received additional federal funds that could be used for instructional purposes. Cameron Elementary School was classified as a

Title I school by Moore County Schools based on the percentage of free and reduced lunch students enrolled in the school, so federal Title I funds could have been used for supplemental or intervention programs.

The middle school used in this study was New Century Middle School (NCMS) also located in Cameron, North Carolina. Five hundred fifty students were enrolled at NCMS in grades six through eight. The demographic population at NCMS included 1.3% Asian, 11.8% Black, 5.1% Hispanic, 2.7% Multiracial, and 78.7% White. NCMS did not meet the free/reduced lunch criteria required for Title I designation; therefore, NCMS did not receive extra funding, programs, or teachers for academic support.

The high school setting in this study was Pinecrest High School located in Southern Pines, North Carolina, where 2,082 students were enrolled in grades 9-12. The demographic population at Pinecrest was 1.3% Asian, 24.2% Black, 6.6% Hispanic, 2.5% Multi-Racial, 1.1% American Indian and 64.2% White. Pinecrest High School did not did not qualify for Title I status and did not receive additional funding due to the socioeconomic status of the school.

Data released by the NCDPI for 2011–2012 indicated that students at or above proficient in Moore County were at the 74.7% level. At Cameron Elementary School, third-grade students scored 71.3% proficient in 2010–2011 and 70.4 % for 2011–2012. Both of these scores were below the district-wide average of 74.7 %. When 2011–2012 NC End-of-Grade Reading data were further reviewed, Cameron Elementary School revealed 80% proficiency among White students, 29.4% Black students, 35.7% Students with Disabilities, and 57.5% Economically Disadvantaged. At New Century Middle School, 2010–2011 data revealed student scores at or above proficient as 80.5%, as well as 2011–2012 reading proficiency for New Century at 77.8%. Further review of New Century Middle School data showed White students scored 82.5%

proficient, Black students 57.1 %, Students with Disabilities 46.7%, and Economically Disadvantaged 67.2%. At Pinecrest High School, reading proficiency based on North Carolina English I EOC was 89.7 in 2010–2011 and 89.6 % in 2011-12. Ninth-grade students at Pinecrest High School yielded proficiency data of White 95%, Black 74.6%, Students with Disabilities 34.1%, and Economically Disadvantaged 77.8%. Though achievement gaps among gender and race may have existed in these schools, for the purpose of this study, achievement gaps were not examined.

Data Collection

Assessment data was collected from 2012–2013 data files for 30 students enrolled in the Reading Plus program at Cameron Elementary, 227 students who enrolled in the Reading Plus program at New Century Middle School and 174 students enrolled at Pinecrest High School. These students had been enrolled in *Reading Plus* for at least one full semester of study or one full year of study, so both pretest and posttest data were available. In addition to the Reading Plus assessment data, NC End-of-Grade (NCEOG) Reading scores and Scholastic Reading Inventory (SRI) scores were collected for review and comparison. The Scholastic Reading Inventory was a computer-adaptive reading assessment program for students in grades K–12 that measured reading comprehension on the Lexile Framework for Reading (Scholastics, Inc., 2014). The Lexile Framework was a system for measuring students' reading levels and matching readers to appropriate instructional level text. The Lexile Framework used a common metric to evaluate both reading ability and text difficulty. By placing both reader and text on the same scale, the Lexile Framework allowed educators to forecast the level of comprehension a student would experience with a particular text and to evaluate curriculum needs based on each student's ability to comprehend the materials. Data were analyzed for each student participating in

Reading Plus to determine the amount of growth from the beginning of the school year. The pretest scores from the Reading Counts test and the post-test reading tests were obtained and the growth or lack of growth for a particular student was determined based on student Lexile scores. As required by the Moore County Schools Internal Review Board (MCSIRB), all student data was and will remain confidential. Students enrolled for less than the nine-month school year were not included in the data analysis.

The qualitative portion of this study was based on the responses to a sixteen-item researcher-developed survey, *Reading Plus* Observations, which was sent to the teachers administering the *Reading Plus* program in the three schools where data were collected to evaluate their perceptions of the effectiveness of the Reading Plus program in their schools.

A pilot administration of the survey was administered to five teachers to establish construct validity. Open-ended, short answer responses were available for teachers to provide information to assist with the clarification of the questions.

Staff members who facilitated, monitored, or implemented the *Reading Plus* program were asked to volunteer to participate in the survey. The survey titled *Reading Plus* Observations was a sixteen-item questionnaire designed by the researchers and administered through a free online survey tool (Google forms; see Appendix E). The questionnaire was based upon the key characteristics, belief statements and the CCSS guidelines. It included an introduction, demographic, attitudinal, behavioral, short answer, and closing instructions. The scale type was a continuous scale (strongly agree to strongly disagree) and categorical scales that ranked items of importance (Creswell, 2013). The participants were assured that their comments were kept confidential and their participation was voluntary. The survey was distributed to a specific selection of 14 teachers via email communication in March 2014 and the participants

were requested to complete it within ten days. This selection of teachers included participating English Language Arts (grades 3–8) and English I (grade 9) teachers, teacher assistants, tutors, and teachers from other content areas that facilitated *Reading Plus*. The teachers were selected based upon their role with the students participating in the *Reading Plus* program. This survey was normed for use by the Moore County School District teachers by piloting the instrument which included short answer questions and open-ended questions.

All data collection instruments were in the participants' academic language. The research settings were Cameron Elementary, New Century Middle, and Pinecrest High schools within the public school system in Moore County. There was minimal risk to any participant and participants were in no foreseeable harm. Student data sets were collected and used. Student participants were not questioned or interviewed.

The researchers used student achievement data that was not personally identifiable by individual student names. All data collected from the county were housed on a flash drive that was accessible only to the researchers and the Director of Dissertation. The flash drive was locked in a secure file cabinet when not being used for research purposes. Names of participants were not used during any phase of the research. Unique identifiers were used to protect all participants. Individual students were not identified, interviewed, or questioned by the researchers. Student data collected from the district was housed on a disc that only the Director of Dissertation could access. Data will be kept for three years and the researcher will dispose of the data at the end of that period.

Students who were enrolled in the *Reading Plus* Intervention program with data for one full semester of study or one full year of study were included in the student data analysis group. Students who were not enrolled in the *Reading Plus* Intervention program were not included.

Students who were in the program but did not yield data for one full semester and/or year of intervention were excluded. The data collected were based upon the number of students who met the criteria of enrollment in the *Reading Plus* Intervention program.

Unless the Superintendent granted permission, the researchers did not name Moore County Schools in final reports. Informed consent by students was not necessary since students were not contacted or identified. The target date for Board presentation was set for April 2014.

Data Analysis

The assessment data were analyzed with regard to progress by grade level, gender, race, and students with disabilities. Forms of data included pre and post assessments designed by and required for the *Reading Plus* program, NC standardized testing End-of-Grade reading scores, and reading Lexile levels. SRI scores from the beginning and the end of the 2012–2013 school year were analyzed for the students enrolled in the *Reading Plus* program. Data were analyzed for outcomes and trends. This information may determine if student progress and growth could be attributed to their participation in *Reading Plus*.

The constant environmental factors were curriculum subject matter, student grade level and reading abilities, instructional strategies, teacher experience, and a teacher's attitude and abilities. Dependent environmental factors were the CCSS, class time length, and course length. The researchers noted the effects and environmental differences of the accessibility of the *Reading Plus* program, teacher facilitation, student motivation, and student attendance.

The qualitative data from the surveys were collected using an online survey tool (Google forms) using a Likert scale as well as open-ended responses. Results were presented in graphic form to assist with trends and patterns.

Cost-Benefit Analysis

In addition to extensive collection and analysis of academic data, preliminary information on the costs of the program will be reviewed. A limited cost-benefit analysis will be conducted to assist the LEA with decisions on cost efficiency and comparisons.

Summary

In summary, the purpose of this program evaluation was to determine the effectiveness of the *Reading Plus* intervention program at the elementary, middle, and high school levels, as well as for students with disabilities. Three schools were selected, each of which served students in need of reading intervention based on NC End-of-Grade test scores and Lexile scores. This study sought to provide a review of reading scores, Lexile levels, and teacher information regarding implementation of the program and fidelity to implementation. While quantitative data included students' reading scores, qualitative data—which were gleaned from surveys completed by teachers who facilitated the program—were necessary to support or explain the resulting scores. Because the district superintendent had requested evaluation of reading intervention programs, this program evaluation focused on the impact of *Reading Plus* on student reading achievement at grades 4–5, 6–8, and 9, as well as students with disabilities who were enrolled in the *Reading Plus* intervention program.

A program evaluation was determined to be the most appropriate design and included both qualitative and quantitative data. This evaluation followed a research design by Daniel Stufflebeam called Context-Input-Process-Product (CIPP), which targeted program improvement. The intended use of this model was to provide guidance to school officials for future decisions regarding the *Reading Plus* intervention program.

CHAPTER 4: RESULTS AND RECOMMENDATIONS

The purpose of this study was to evaluate the *Reading Plus* reading program used in the Moore County Schools and, specifically, to evaluate its use in the three schools that were chosen because each of the selected schools used a web-based platform and systematic collection of data. Two sources of information were used in this evaluation. First, Lexile data were reviewed and analyzed. Second, an online survey was used to collect information from Reading Plus facilitators. By using this information, the evaluator sought to answer the following question: To what extent, if any, did the Reading Plus program impact student academic achievement in reading for students with disabilities who were enrolled in the program based on student Lexile scores generated from the Scholastic Reading Inventory (SRI)?

During the study, one other question continued to arise. Because remediation programs, unless provided by the state, are costly and must be purchased by school funds, the recurring question was the following:

Does Reading Plus provide a financially efficient option considering (a) other programs that are similar, and (b) the impact on student achievement?

This study addressed the progress of Students with Disabilities who participated in the *Reading Plus* program in three schools for the purpose of determining whether or not these students received benefit from the *Reading Plus* program.

A review of the literature revealed that since the 1800s, research and discussions about teaching reading and remediating reading skills have varied in focus and preference of methodology. In the earlier years, students who read well were thought to be academically capable, while students who struggled with reading were inappropriately considered intellectually deficient and less capable mentally to conquer academic work. A student's ability

or struggle to read determined his or her career path. Educators encouraged students who read well to pursue more complex vocations while tracking weaker readers into trade schools where they could learn skills that did not require a great deal of reading.

Phonemic awareness, an auditory approach to reading letters, required the reader to associate a letter or group of letters with corresponding sounds. As the reader vocalized letters, the sounds were blended into a word. Research indicated that training in phonological awareness, coupled with instruction in specific letter-sound relationships, significantly enhanced growth in early word-reading skills (Torgesen et al., 1994, p. 278). The *deaf mute* method, more commonly known as reading through recognition of sight words, focused on a visual method of recognizing written words while the reader silently comprehended meaning from context (Rodgers, 2001, p. 956). Post World War II children, or baby-boomers, learned to read through the sight-word method as they applied the skill to stories about Dick, Jane, and Spot.

In Rudolph Flesch's (1955) book, *Why Johnny Can't Read—And What You Can Do About It*, the author stressed the need for early phonics education and attempted to debunk the theory by teachers that young school-age children might not be developmentally ready to read. His work was followed by a group of reading experts appointed to a National Reading Panel who spent years studying reading research in order to determine five key areas necessary to reading instruction. Their findings were then publicized in a special 449-page report, "Teaching Children to Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and the Implications for Teaching Reading" by the NRP, which was released in 2000. This report included evidence through research of significant areas that should be included in reading instruction. Identification of these five key areas of (a) vocabulary, (b) comprehension, (c) fluency, (d) phonemic awareness, and (e) phonics changed the way reading was addressed in

schools by impacting education policy, classroom instruction, and textbook development. The subject of this program evaluation study, *Reading Plus*, trains fluidity of eye movement while also addressing the five key reading skills noted above by the NRP (2000) in order to improve reading.

Reading was not only a matter of looking at words and sounding out letters. The physical and neurological connection of the reading process could not be avoided. Because *Reading Plus*, the focus of this program evaluation, was a commercial reading remediation program that used current computer technology to train smooth eye-movements during the process of reading, literature from the field of ophthalmology was important in the literature review. Therefore, information from three eras of eye-movement research from 1879 to 2012 was reviewed.

During the first era of eye research and the quest to determine the connection between the physical eye and reading, Emile Javal documented the "oculo-motor nature of the reading process" as early as 1879. Subsequent work by researchers, such as Miles A. Tinker, noted not only that more efficient reading occurred by sweeping the eye across multiple works but that reading speed and reading comprehension appeared to be related. This second period of research noted that readers perceive information during the time the eye is fixed on a word. Tinker further revealed findings to show a reader's eye-movements, or saccades, created a vehicle for identifying reading problems through the types and lengths of the fixations and movements (Tinker, 1933). During this period, technology was developed that included eye-movement photography equipment, pacers, films, and the tachistoscope, a mechanical device which measured eye-movement. The tachistoscope spurred new efforts to create speed reading programs that could improve reading efficiency (Williams, 2009). In addition, further

development of complex technology through computers propelled improved methods of reading remediation.

Through technology, researchers were able to verify a connection between fluid eye-movements and successful cognitive processes in reading (Rayner, 1998), thus revealing that a student's need for remediation was more complex than the simple need to connect sounds to symbols in reading. During a third era of eye-movement research, the Visagraph III was developed to record eye positions during reading. A study using the Visagraph III verified that slower developmental eye-movement (DEM) corresponded to weaker reading skills because the duration of both fixations and reading rate determined through technology corresponded to standardized reading achievement scores (Webber et al., 2011). Further research in eye movements and reading revealed differences in eye movements between good readers and poor readers; faster readers make shorter fixations, longer saccades (the jump of the eye from one fixation to another), and fewer regressions than slow readers. This work categorized dyslexic readers as plodders and explorers; plodders made shorter forward saccades and more regressions, while explorers demonstrated frequent word skipping, extended forward saccades, and regressions (NRP, 2000).

Disability Definitions

Educators understood that all students do not learn the same way or at the same rate. Physical and neurological problems impacted a special needs student's ability and/or method of absorbing and retaining information. Children with severe learning problems were identified by North Carolina school or agency personnel as an Exceptional Child, or student with a disability, under one or more category defined in North Carolina law and policy (Policies Governing Services for Children with Disabilities, 20 U.S.C. 1401(3); 1401(30); 34 CFR 300.8; 115C-

106.3(1)(2)). Fourteen categories of disability were specifically defined in legislation. In order to be formally approved as a student with a disability, the child must have met one or more of the definitions, and the identified condition must have impeded the child's educational performance or the child was not identified and funded under the Division of Exceptional Children's Services. Definitions and terms used to identify a child with a disability in North Carolina included the following:

1. Autism (AU): a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three, which adversely affects a child's educational performance. The impairment may include Autistic Disorder, Pervasive Developmental Disorder-Not Otherwise Specified (Atypical Autism), Asperger's Disorder, Rett's Disorder, Childhood Disintegrative Disorder or all Pervasive Developmental Disorders.
2. Deaf-blindness (DB): hearing and visual impairments that occur together causing severe communication and other developmental and educational needs.
3. Deafness (D): hearing impairment that is so severe that the child is impaired in processing linguistic information through hearing with or without amplification.
4. Developmental delay (DD): a child, age 3 through 7, whose development and /or behavior is delayed or atypical in at least 3 areas, including physical development, cognitive development, communication development, social or emotional development, or adaptive development.
5. Serious emotional disability (SED): a condition exhibiting over a long period of times and to a marked degree one or more of specific areas, including educational progress, interpersonal relationships, inappropriate types of behavior or feelings

under normal circumstances, general pervasive unhappiness or depression, or tendency to develop physical symptoms or fears associated with personal or school problems; includes schizophrenia but not social maladjustment.

6. Hearing impairment (HI): permanent or fluctuating impairment in hearing;
7. Intellectual disability (ID): significantly sub average general intellectual functioning that exists concurrently with deficits in adaptive behavior and manifests during the development period.
8. Multiple disabilities (MD): two or more disabilities occurring together (such as intellectual disability-blindness, intellectual disability-orthopedic impairment, etc.), the combination of which causes such severe educational needs that they cannot be accommodated in special education programs solely for one of the impairments. Multiple disabilities does not include deaf-blindness.
9. Orthopedic impairment (OI): a severe physical impairment caused by a congenital anomaly, impairments caused by disease (e.g., poliomyelitis, bone tuberculosis, etc.), and impairments from other causes (e.g., cerebral palsy, amputations, and fractures or burns that cause contractures, etc.).
10. Other health impairment (OHI): having limited strength, vitality or alertness, including a heightened alertness to environmental stimuli, that results in limited alertness with respect to the educational environment, that is due to a chronic or acute health problem.
11. Specific learning disability (SLD or LD): a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in the impaired ability to listen, think, speak,

read, write, spell, or to do mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia.

12. Speech or language impairment (SLI): a communication disorder, such as an impairment in fluency, articulation, language, or voice/resonance that may include function of language (pragmatic), the content of language (semantic), and the form of language (phonologic, morphologic, and syntactic systems), or a speech or language impairment which may result in a primary disability or may be secondary to other disabilities.

13. Traumatic brain injury (TBI): an acquired injury to the brain caused by external physical force or by internal occurrence resulting in total or partial functional disability and/or psychosocial impairment caused by, but not limited to, open or closed head injuries, cerebrovascular accidents (e.g., stroke, aneurysm), infections, kidney or heart failure, electric shock, anoxia, tumors, metabolic disorders, toxic substances, or medical or surgical treatments. The brain injury can occur in a single event or result from a series of events (e.g., multiple concussions). Traumatic brain injury also can occur with or without loss of consciousness at the time of injury. Traumatic brain injury may result in impairments in one or more areas, such as cognition; language; memory; attention; reasoning; abstract thinking; judgment; problem-solving; sensory, perceptual, and motor abilities; psychosocial behavior; physical functions; information processing; and speech. Traumatic brain injury does not apply to

brain injuries that are congenital or degenerative, but can include brain injuries induced by birth trauma.

14. Visual impairment including blindness (VI): impairment in vision that, even with correction, impacts a child's educational performance, and may include partial sight or blindness. A visual impairment is the result of a diagnosed ocular or cortical pathology.

In addition to these formal categories for Students with Disabilities, as approved by the North Carolina Department of Public Instruction Division for Exceptional Children, one other disability identification impacted student achievement and the service a student received in school. Section 504 of the Rehabilitation Act of 1973 is federal legislation that predated Public Law 94:142, which was the original law that defined exceptionality. Section 504 legislation was the first civil-rights for persons with disabilities. Section 504 was the last sentence in the Rehabilitation Act of 1973 legislation and stated,

> No otherwise qualified *handicapped individual* in the United States, as defined in Section 7 (6) shall, solely by reason of his or her disability, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance or under any program or activity conducted by any Executive agency or by the United States Postal Service. (Federal Communications Commission, n.d., para. 4)

The 1973 federal legislation allowed students with a disability that was not later applicable under IDEA to receive special accommodations in the classroom. For purposes of this study, students identified under Section 504 and students identified under IDEA were considered Students with Disabilities. In addition, students identified through North Carolina procedures as Academically

or Intellectually Gifted (AIG) were included in the broader group of Students with Special Needs.

Data Overview

The focus of this chapter included two key sources of data. First, the study analyzed assessment data from the group of Students with Disabilities that were included as participants in the *Reading Plus* reading program in grades four through nine. Second, information was provided by teacher facilitators through participation in a survey regarding their implementation of the *Reading Plus* program. With regard to student assessment data, it was necessary for data to be available for a participating student for at least one full semester during 2012–2013. This data included both pre and post assessments and was collected from three schools from Moore County Schools in North Carolina. The schools were Cameron Elementary School, New Century Middle School, and Pinecrest High School. Data included overall reading achievement as measured by a standardized test of reading achievement (Scholastic Reading Inventory) and a teacher survey. Each school was reviewed separately and conclusions were drawn for each level, as well as for the group as a whole. In addition, a survey was used to collect qualitative data from teachers who had implemented the *Reading Plus* program. The purpose of the survey was to collect professional opinions and observations regarding student improvement and student behavior, such as motivation, confidence, and general reading success, as viewed by the teachers who facilitated the program and as related specifically to the *Reading Plus* program. Recommendations were provided based on qualitative data from the teacher survey and quantitative data from the test results. In addition, recommendations were made regarding program costs and administrator comments.

Evaluation Model

A program evaluation was determined to be the most appropriate design and included both qualitative and quantitative data. This evaluation followed an evaluation design by Daniel Stufflebeam called Context-Input-Process-Product (CIPP), which targeted program improvement. The intended use of this model was to provide guidance to school officials for future decisions regarding the *Reading Plus* intervention program.

The purpose of product evaluation was to relate outcomes to objectives and to assess the overall worth of a procedure in terms of its effects. An advantage of the CIPP model was that it allowed the program evaluators to view evaluation as cyclical, rather than project based (see Appendix C). This model provided the flexibility to evaluate a program in stages depending on the needs of the stakeholders (Alkin & Christie, 2004).

Although the context, input, and process of the *Reading Plus* program were critical points depending on the stage of a program, administrators in the Moore County Schools wanted to know more about the product of the program. To determine the context of this problem, administrators sought valid information regarding whether or not the program improved reading achievement for those students enrolled in the program based on student Lexile scores that were generated from the SRI. Dr. Kathy Kennedy, Moore County Schools' Assistant Superintendent for Instructional Design and Innovation noted, "Curriculum needs to be very involved in this process. The data I have reviewed thus far isn't indicating we need to expand (*Reading Plus*) at this point. We probably need to see end of year data first" (K. Kennedy, personal communication, October 1, 2012). From an email message in May 2013, Dr. Kennedy required administrators to "review the EOY *Reading Plus* data and compare it to the SRI data for the students participating in *Reading Plus* in order to determine next steps. She noted (*Reading Plus*

is) . . . very expensive now so we have to ensure we are getting the results to continue" (K. Kennedy, personal communication, May 1, 2013).

Following the recommendation of district administrators, the Scholastic Reading Inventory measurement system was used to benchmark student Lexile growth. Dr. Kennedy recommended the process outlined in the *Growth Expectations: Setting Achievable Goals* by Kimberly A. Knutson, EdD (2011), of Scholastic Research, and MetaMetrics to outline how teachers can use Scholastic Reading Inventory (SRI), a test of reading comprehension developed by Scholastic Inc., to set reading growth goals and evaluate students' responsiveness to instruction by measuring fall-to-spring growth expectations.

The *Reading Plus* program evaluation using the CIPP model consisted of three steps initially theorized by Stufflebeam and focused on the product of the targeted program. The first step was *delineating*, which involved assessment of the *Reading Plus* program based on program expectations by administrators in the Moore County Schools. The second step in the evaluation process was *obtaining*. Product information was obtained through both interim and final measures of data from those students who were enrolled in the *Reading Plus* program and by analyzing responses of teachers to survey questions. With regard to student products and data, Lexile scores were recorded at two benchmark periods. The first period was prior to implementation of the program at the beginning of the school term and the second period was at the point of exit from the program. With regard to the teachers' products, results were obtained from survey questions and interviews that were completed by classroom teachers who facilitated *Reading Plus*. Survey data included at least one teacher from each grade level in the program from each study site, including four teachers from the elementary school, six teachers from the middle school, and three teachers from the high school. The survey was used to gather

qualitative data of observable behavior during implementation of the program. The survey results were intended to document the behavioral responses of students in the program as well as the professional opinions of the teachers regarding program implementation and training. The qualitative data were intended to support, clarify, and/or explain the quantitative results.

The third step in the evaluation process was *providing.* Information and data from the *Reading Plus* program evaluation will be provided to decision makers including the Superintendent of the Moore County Schools and the Director for Exceptional Children's Services for the purpose of reporting and providing current information that supports problem solutions and future decisions by the school system leadership.

In order to describe the problem solutions, it was important to understand the problem. Among the general student population, students with disabilities, who were identified for service in the area of reading, demonstrated neurocognitive or physical issues that impede reading skills. These issues were documented in psychological reports that were collected when the student was identified by the school system in one or more of 14 categories as a student with a disability (NCDPI, 2014). Depending on the deficits involved in a student's academic problems and subsequent identification as a special needs student, reading can be impacted in areas such as fluency, comprehension, phonemic awareness, phonics, or vocabulary. A student who was formally identified as a Student with a Disability (Exceptional Child with special needs under NC law or Section 504 identified student under federal law) received remediation based on specific identified needs that were outlined in a written Individual Education Plan (IEP). Specific programs such as *Reading Plus* were not designated in the student's IEP. Instead, the student's identified need, such as phonics or generalized reading, was written into the plan with goals and objectives to address the need. An additional area in North Carolina identification was

that of Academically or Intellectually Gifted (AIG). Through AIG, a student was identified for one or more areas, such as math. In some cases, a student was identified in an area, such as math, but still demonstrated deficiencies in another area, such as reading. Teachers then determined appropriate programs or materials to address the need and improve the student's skills.

The issue discussed in this study was that individual schools were allowed to choose their own reading intervention/remediation programs, in addition to using state mandated or state provided programs, in order to address the needs of a defined population of students who were not achieving at a proficient level on the end-of-grade tests. Struggling students included both regular education, non-identified students, as well as identified Students with Special Needs. The remedial programs were appropriate to use with identified Students with Special Needs when the student's need was matched with the program's method and goals. Schools throughout the county selected from as many as 13 different programs. Previously, schools did not record and maintain consistent data to validate use or progress with student groups.

Delineating

The first step of the Context-Input-Process-Product (CIPP) model is delineating, which involves the expectations by administrators of the Moore County Schools, who sought valid information regarding whether or not the program improved reading achievement for those students enrolled in the program. These administrators not only wanted to see improvement in achievement but they also wanted to know outcomes for the five domains of reading. The NRP identified five domains that included vocabulary, fluency, comprehension, phonemic awareness, and phonics. Dr. Aaron Spence, Superintendent of Moore County Schools, expected reading intervention programs, including *Reading Plus*, to improve students' reading achievement and

requested that program evaluations be conducted so that decision makers could have valid information on which to base future curricula decisions. The most important goal by the Moore County Schools administrators was to determine whether any program implemented by a school made a positive difference in students' reading. This information could be assessed quantitatively through pre and post tests for remedial programs, end-of-grade results, end-of-course results, report card data, and IEP progress. The information could be qualitatively assessed through teacher observations. For purposes of this study, pretests and posttests for *Reading Plus* were used in addition to the teacher survey.

Current standards focus significant attention to the complexity of the text that students are reading as well as how students read the text. Students advancing through the grades must develop comprehension skills and also apply them to increasingly more complex material from a designated text band (Metametrics, 2014). Therefore, beginning in as early as second grade, students are expected to read well each time they tackle more complex text material.

Local expectations are influenced by North Carolina requirements regarding reading. *Read to Achieve* 2012 legislation (House Bill 950/S.L. 2012-142 Section 7A) (G.S. 115-C-83) required third grade students to perform at a proficient level on the End-of-Grade (EOG) reading test in order to be promoted to fourth grade. Students who were not proficient by the end of the school year attended a Summer Reading Camp in order to improve their skills. If the student did not meet proficiency based on the EOG test at the end of the summer program, then the student moved to the next school year with "retained" label. The "retained" student was placed in a third-grade class, a third/fourth transition class, or an accelerated reading class. The student was then tested again in the fall to determine if the "retained" label could be removed and the student could be promoted to fourth grade. In a Department of Public Instruction document for

Exceptional Children's Directors, the department stated, "R2A (*Read to Achieve*) could have a significant impact on students who may experience difficulty meeting proficiency on the EOGs. These students need to be given the same opportunities as other struggling readers who are not meeting proficiency" (NCDPI, 2013b, p. 2).

In addition to *Read to Achieve*, the *North Carolina Responsiveness to Instruction* (NCRtI) initiative promoted school improvement through engaging, high quality instruction. Teachers and schools were expected to facilitate learning through evidence-based differentiated instruction and intervention within a multi-tiered framework based on data. Tier I addressed all students who receive instruction through the NC Standard Course of Study. Tier II included approximately 20% of students who received NC Standard Course of Study and supplemental evidence-based programs for instructional support. Tier III included approximately 5% of students, both the NC Standard Course of Study and evidence-based programs with increased frequency, duration, and/or intensity of instruction (North Carolina Read to Achieve: A Guide to Implementing House Bill 950/S.L. 2012-142, Section 7A). According to the North Carolina Department of Public Instruction, 20% of students need supplemental support while approximately 5% of students need intensive support (http://www.ncpublicschools.org/docs/academicservices/conference/2014/presentations/98.pdf). A comparison of the two charts (2008 and 2012) for proficiency levels revealed changes in academic expectations for public school students, as shown in Tables 4 and 5. North Carolina legislation passed in 2012 requiring third grade students to read at grade level in order to move to the next grade.

Table 4

Achievement Level Ranges for the North Carolina End-of-Grade Tests Reading Comprehension at Grades 3–8 (2008)

Subject/Grade		Level I	Level II	Level III	Level IV
Reading (Starting with the 2007–2008 school year)	3	≤ 330	331–337	338–349	≥ 350
	4	≤ 334	335–342	343–353	≥ 354
	5	≤ 340	341–348	349–360	≥ 361
	6	≤ 344	345–350	351–361	≥ 362
	7	≤ 347	348–355	356–362	≥ 363
	8	≤ 349	350–357	358–369	≥ 370

Note. HSP-C-018, October 2, 2008.

Table 5

Achievement Level Ranges for the North Carolina End-of-Grade Tests Reading Comprehension at Grades 3–8 (2012)

Grade	Level I	Level II	Level III	Level IV
3PT	At or below 185L	190L to 310L	315L to 620L	At or above 625L
3	At or below 260L	265L to 515L	520L to 775L	At or above 780L
4	At or below 365L	370L to 620L	625L to 905L	At or above 910L
5	At or below 495L	500L to 725L	730L to 980L	At or above 985L
6	At or below 515L	520L to 800L	805L to 1055L	At or above 1060L
7	At or below 620L	625L to 875L	880L to 1105L	At or above 1110L
8	At or below 620L	625L to 905L	910L to 1160L	At or above 1165L

Note. NCDPI (n.d.).

Obtaining

With regard to products within the evaluation model, results were gleaned from two sources. Survey questions were completed by teachers who facilitated *Reading Plus*. In addition, Lexile scores were used to record student progress at two benchmark periods. The first period was prior to implementation of the program and the second period was at the point of exit from the program.

Qualitative data. Teachers who facilitated the *Reading Plus* program were asked to complete a survey regarding the program components and to note their observations and perceptions of student success. The survey results were intended to document the behavioral responses of students in the program, as well as to record the professional opinions of the teachers regarding program training and implementation. The qualitative data from the survey were intended to support, clarify, and/or explain the quantitative results from the tests. Questions included in the survey referenced (a) training and support, (b) program implementation, (c) comprehension, (d) fluency, (e) vocabulary, (f) phonemic awareness, (g) phonics, (h) reading stamina, (i) non-verbal behaviors, and (j) motivation strategies. The survey was sent to 14 teachers who had facilitated the *Reading Plus* program in the three specific schools. Respondents were asked to mark each item on a scale of one (lowest) to five (highest) and offer comments. Ten teachers (71%) responded with completed surveys. Two of the ten (20%) who responded were elementary teachers. Six of the ten (60%) who responded were middle school teachers. Two of the ten (20%) were high school teachers.

Survey questions about training and implementation. Item #1 addressed teacher training/preparation/support. Background in the area of training revealed that Taylor and Associates conducted training on site for the teachers who implemented the program at each

school included in the study. Teachers completed online modules and then received face-to-face, on-site training by company representatives. The on-site training sessions were a total of three to five hours and focused on components of the program, as well as specific implementation of the *Reading Plus* program. In addition, a representative for the program conducted one-on-one training in person and over the phone to personalize the training with teachers who were preparing to implement the program. On a scale of one to five (with one being "no training/support" and five being "significant training/support"), 10% scored the question response at level three with regard to sufficiency of training/preparation. Eighty percent of the respondents noted a score of four with regard to the sufficiency of the training/preparation. Ten percent noted a score of five, which was the highest level of training/support.

Figure 1 shows teachers' responses regarding a survey specific question regarding whether or not they had implemented the *Reading Plus* program with fidelity. Thirty percent of the respondents noted that they had implemented the program with the highest level of fidelity (five) and 70% noted program implementation with high fidelity (four).

Survey questions about the five domains. The five domains of reading, including comprehension, fluency, vocabulary, phonemic awareness, and phonics, were also included in the survey. Teachers were asked to rate these areas with regard to skill improvement for students in the *Reading Plus* program with whom they worked. Figure 2 shows survey responses regarding the five domains.

Items #3 and #4 addressed comprehension. Respondents noted the impact of the *Reading Plus* program on comprehension at a level of 4.25 out of a possible five with 100% of the responding teachers noting that students increased their rates of retention of text as well as new vocabulary. One teacher noted that the *Reading Plus* program allowed her "to target specific

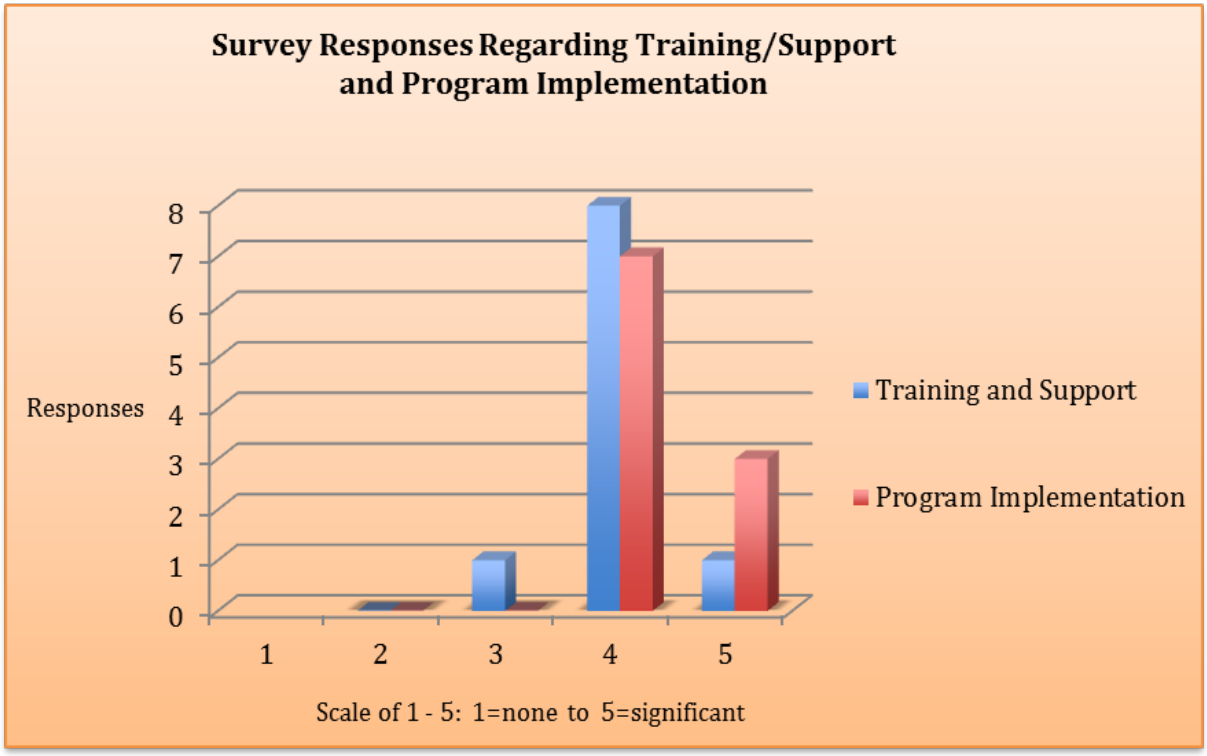

Figure 1. Survey responses regarding training/support and program implementation.

Note. Ten of 14 teachers responded to the survey questions regarding training/support and program implementation using a scale of one (none) to five (significant). All teachers marked 3, 4, or 5 with regard to training/support. All teachers marked 4 or 5 with regard to program implementation. Responses indicated that teachers believed they had received adequate training/support to implement the *Reading Plus* program and that they implemented the program with fidelity.

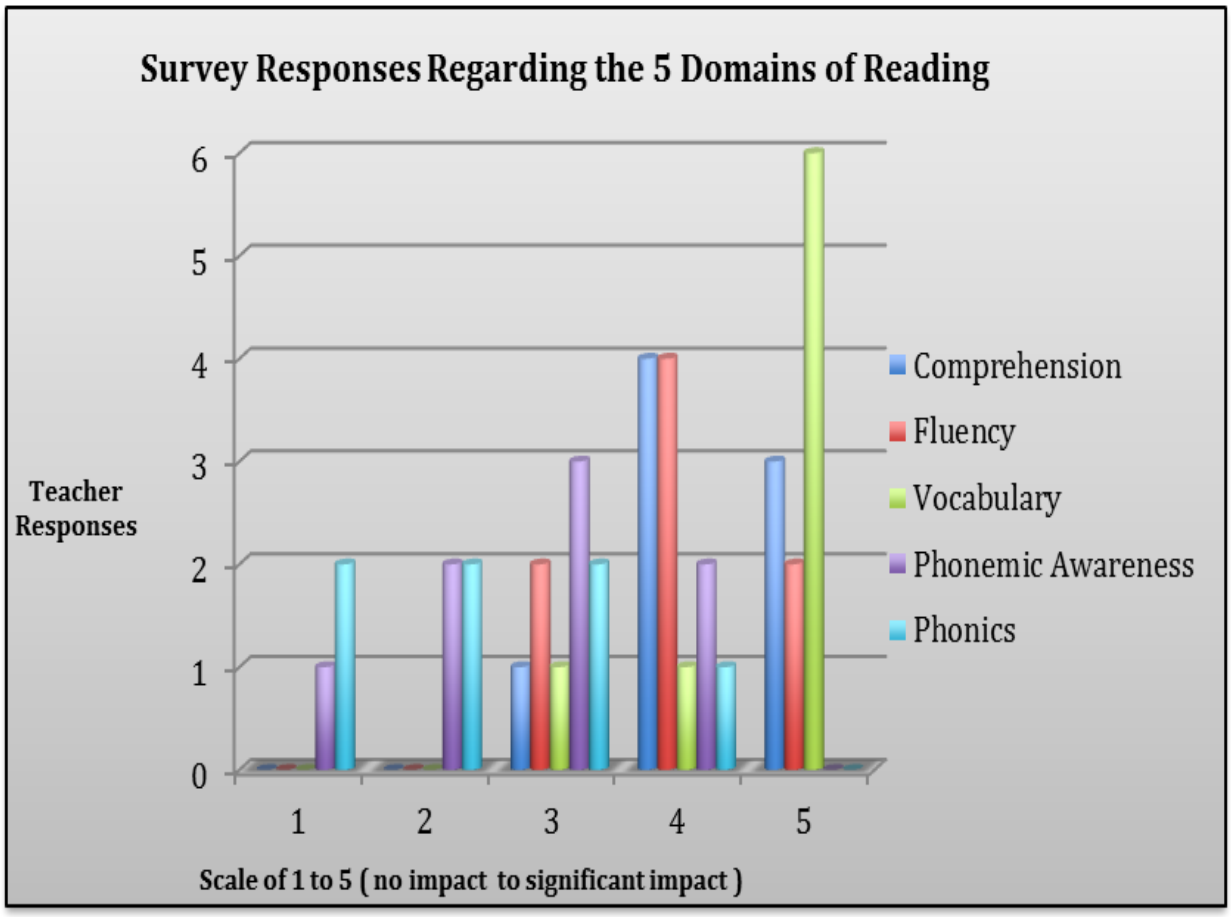

Figure 2. Survey responses regarding the 5 domains of reading.

Note. Eight of 10 responding teacher facilitators answered survey questions regarding the impact of the RP program on the five domains of reading using a scale of one (no impact) to five (significant impact). (For example, 1 teacher scored Vocabulary at 3, 1 teacher scored Vocabulary at 4, and 6 teachers scored Vocabulary at 5.) Teachers rated vocabulary highest, followed by comprehension and fluency, noting program impact on their students. Phonemic awareness and phonics received the lowest survey scores regarding the impact of these components on student success.

comprehension skills and to individualize instruction based on each student's reading/ comprehension deficiencies." Another teacher wrote, "Comprehension improved in the areas of inference, main ideas, theme, point of view and tone."

"Reading comprehension is the construction of the meaning of a written text through a reciprocal interchange of ideas between the reader and the message in a particular text" (Harris & Hodges, 1995, p. 39). The NRP (2000) explained comprehension as the moments when "a reader reads a text to understand what is read and to put this understanding to use" (p. 5). In addition, the panel noted that comprehension skills were active when the reader could learn, locate information, or even be entertained in order to gain meaningful memories of the reading text and then communicate that information to others (NRP, 2000). Further, comprehension strategies guide the student as he reads and writes so that he is able to understand the text and use the information effectively (NRP, 2000). The evaluator believes it is an important finding that 100% of the teachers polled believed their students' comprehension improved with use of the *Reading Plus* program.

Items #5 and #6 asked teachers to rate their students' improvement in the area of fluency. Fluency is the student's ability to read text with speed, fluidity, accuracy, and expression. The NRP (2000) emphasized "[there is] a close relationship between fluency and reading comprehension. Students who are low in fluency may have difficulty getting the meaning of what they read" (NRP, 2000, p. 1). The NRP included speed, accuracy, strong word recognition skills, and proper expression as skills that impacted fluency skills but noted that these components do not always lead to fluency. Fluency was critical so that readers could devote their attention to understanding the meaning of the content instead of identifying the words in print (Florida Center for Reading Research, 2006).

Fluency skills were taught but no one method was proven best for all students. Many educators contended that practice increases fluency, so reading aloud and reading frequently were understandable instructional solutions. Procedures such as repeated oral reading practice and guided oral reading practice and programs such as Sustained Silent Reading, Accelerated Reader, and other incentive programs were analyzed for effectiveness by the NRP. The panel noted that these procedures improved sound/word recognition and comprehension, along with the speed and accuracy of the oral reading process, thus contributing to reading achievement. The Florida Center for Reading Research (2006) recommended fluency instruction built upon phonemic awareness, oral reading practice, and listening to appropriate reading of others. Based upon the uncertainty of correlational studies, NRP reminded educators that reading practice was important to reading attainment, though stronger readers may read more and continue to improve their reading because they enjoy reading. One respondent to the teacher survey noted an emphasis through the *Reading Plus* program on "building stamina daily through practice." A second teacher wrote, "It required my students to read more quickly while simultaneously paying attention to the content. The speed progression was incremental, but over time—significant." Yet a third teacher noted, "Students are able to read more quickly because of the exercises involving eye movement. I often ask my students to read a question out loud. I have noticed that they are reading much more fluidly than they did in the beginning of the year." A significant observation by a different teacher facilitator was,

> *Reading Plus* helped increase the fluency skills by letting the students decide when they were ready to move forward. If the program detected a struggle, it gave another choice to decrease the speed. Students were able to see for themselves how fast they could

comfortably read while still understanding the material they read. It helped the students to understand the importance of rate and understanding.

Survey Items #7 and #8 addressed vocabulary. Eight teachers responded to these questions. All stated that vocabulary skill improved among their students. The NRP (2000) noted that vocabulary occupied an important position in learning to read. "As a learner begins to read, reading vocabulary encountered in texts was mapped onto the oral vocabulary the learner brings to the task. The reader learns to translate the (relatively) unfamiliar words in print into speech, with the expectation that the speech forms will be easier to comprehend" (NRP, 2000, p. 7). Biemiller and Boote (2006) contended the importance of vocabulary instruction for children who have not been exposed to a vocabulary-rich environment as critical. Biemiller and Boote stated that "early vocabulary limitations make 'catching up' difficult even though once in school, children appear to acquire new vocabulary at similar rates. To 'catch up,' vocabulary-disadvantaged children have to acquire vocabulary at above-average rates" (NRP, 2000, para. 7). Therefore, students who acquired stronger vocabulary skills will most likely handle academic texts in a more competent manner. With the importance of vocabulary for comprehension and the critical need for exposure to a rich vocabulary environment, it was imperative for vocabulary and comprehension to be taught on a daily basis. In their comments, teachers wrote, "If implemented correctly, teachers can use the appropriate grade level (most frequent) vocabulary words to improve vocabulary knowledge and words in context," and "I especially noticed improvement in my students' use of context clues and prefix and suffix variations of base words."

Items #9 and #10 addressed phonemic awareness, which is the reader's ability to hear, identify, and use sounds in reading by manipulating the sounds to create meaning. Teachers

scored this area lower with an average response of 2.75 out of a possible 5. Responding to the questions, a teacher wrote, "Students are having less difficulty pronouncing words. I also saw many students making connections between words with similar spellings, patterns, etc." Another teacher commented," For most of my students, phonemic awareness was not a critical or weak skill," while another teacher wrote, "This is a difficult area to measure. Much individual help was necessary to help students with pronunciation of new vocabulary." Two additional responses included, "Did not notice," and "My students did not start at this level in *Reading Plus.*" The researcher found the last two comments most interesting because 100% of the respondents indicated that they were trained and implemented the program with fidelity according to the training. If teachers were well trained in the *Reading Plus* program and if the program was implemented with fidelity, facilitators of the program understood that it was their responsibility to monitor for difficulty in all of the five areas. In addition, facilitators were trained to conduct individual and small group sessions to address any weak area on a regular basis. If the teachers were well trained as they indicated in survey item #1 and if they implemented the program with fidelity as they indicated in survey item #2, then teachers would have continually addressed phonemic awareness throughout program implementation.

Survey items #11 and #12 assessed the impact of phonics skills. Only seven teachers responded to these items and the average of the responses was 1.85 out of a possible 5. One teacher noted, "For most of my students, phonemic awareness was not a critical or weak skill," while another respondent wrote, "This is a difficult area to measure. Much individual help was necessary to help students with pronunciation of new vocabulary." Other teachers noted "an increase in basic phonics skills" and "exposure to new words forces the student to sound them out and use context clues."

Because small group and individual instruction were important support components of program facilitation, these responses about phonics and phonemic awareness raised questions regarding attention to training and fidelity of implementation. Twenty percent of teachers surveyed did not respond to the questions about the impact of phonics. Fifty percent of teachers surveyed responded with "Not known," "My students did not start at this level," "Did not notice," or left the item blank when asked about the impact of phonemic awareness.

Because the *Reading Plus* program was an automated computer program, students did not read out loud unless the teacher worked one-on-one for skill improvement or unless the teacher introduced one of the optional programs. Teacher training included an approach to working individually with students regarding oral reading, so there were program components to assist students with phonemic awareness and phonics skills if the teacher chose to implement the additional optional components.

Survey questions about reading stamina and non-verbal behaviors: Survey items #13 and #14 assessed reading stamina among students who were receiving support through *Reading Plus* instruction. In response to the survey, reading stamina was scored at level four or level five (on a scale of one to five with one being least impact and five being greatest impact) by 80% of the respondents, who noted that students were "able to handle much longer passages now in comparison to the beginning of the year" and that students increased "the length of books they (students) chose and read for independent reading." Reading stamina was the students' ability to read with attention for long periods of time. Reading stamina was exceptionally important for end-of-grade tests when students must read long, grade-level passages and respond to complex questions regarding the material. One hundred percent of the teachers who responded to the survey scored the impact of *Reading Plus* on reading stamina at a high level (four or five).

Teacher comments included “students were compelled to stay with a selection until it was completed on the same day” and “students are able to handle much longer passages now in comparison to the beginning of the year . . . due to the gradual increase in length of the comprehension exercises.” One teacher noted “marked improvement” for her students’ reading stamina while another wrote that “EOG stamina is better after a year’s worth of teaching with *Reading Plus* as an intervention.” One respondent wrote, “Reading stamina is one of the most difficult skills to develop for my struggling readers. I saw improvement in at least 2/3 of my students as shown in the length of time on the program and the length of books they chose and read for independent reading.” Figure 3 shows survey responses regarding reading stamina.

Survey respondents were also asked to list any positive non-verbal behaviors that they observed in students as they used the *Reading Plus* program. Teachers reported the following positive behaviors:

- Joyous facial expressions when achieving 90% or when leveling up.
- Focus on the program.
- Working after school on lessons on their own.
- Moving up levels.
- Becoming more serious about the program over the year.
- Physical control of the head when the student stops moving his/her head and instead uses eyes to track when reading.
- Responding well to individual and class goals.
- Enjoying competition.
- Constantly smiling.
- Yelling out loud by accident or out of excitement at accomplishment.

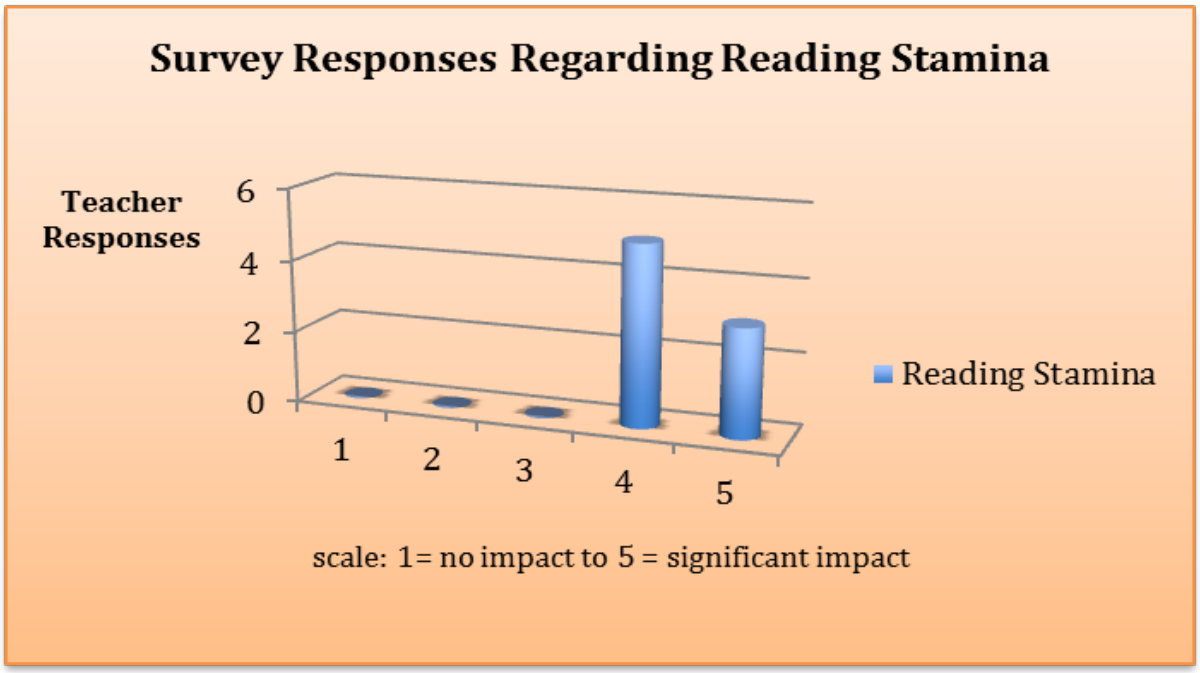

Figure 3. Survey responses regarding reading stamina.

Note. Eight teachers responded to the survey questions that addressed the area of reading stamina. All respondents indicated a positive reaction to the program results by marking level four or five on a scale of one to five to show that the *Reading Plus* program made a strong impact on their students' reading stamina.

- Tracking focused.
- Focused attention to reading, sitting up, or going back to passages to find answers.
- Better behavior due to feeling more successful.

Teachers were also asked to list any negative non-verbal behaviors that they observed in students as they used the *Reading Plus* program:

- Some frustration when the program does not count a score.
- Frustration involving the “Combo” requirement.
- Some loss of interest/motivation.
- Off-task behaviors for non-medicated students with ADHD.
- Two students lose focus and “zone out” related to other classes and stress.
- Toggling over to other websites.
- Difficulty focusing.
- Rushing through questions.
- Not using re-reads.
- Negative behavior when a goal was not accomplished.
- Giving up, rushing, lack of focus.

Finally, teachers were asked to list any motivation strategies that they used with students as they participated in the *Reading Plus* program:

- All Level-Up awards for the Read Around and the See Reader were printed and posted.
- Principal signature on See Reader Awards for levels H, I, J, K, L, and M which were mounted and posted on the wall. All level up awards were posted on walls and then given to students at the end of the semester.

- Small wrapped candy was also used as an incentive as students attained a score of 90% or better on See Reader.
- Chocolate candy offered to those who Leveled Up.
- Periodically students would receive “Free Friday” if all goals were meant with 85% or better.
- Sweet treats.
- Conferencing daily or at least weekly.
- Configuring the settings for individual students; not relying on RP program settings.
- Clear guidelines for “graduating out.”
- Connections between RP work and ELA classwork.
- Frequent conferencing with parents and through PEPs.
- Students may earn “free time” on Fridays if they complete all assigned work.
- If they complete more work than assigned, they earn bonus points for extra free time and extra credit at the end of the 6 weeks. Each Monday, our goal was to complete 20-25% of our work for this week. This allowed them to pace themselves and also “plan out” their work for the week. This also made the number of assignments seem a little less overwhelming.
- Verbal and nonverbal praise.
- Candy.
- Rewards from treasure box.
- Certificates.
- Celebrations.
- Prizes or rewards.

- Competitions.
- Free computer time for completing all weekly goals.
- Free Friday Time for accomplishing a certain amount of “levels” during the week.
- Encouraging words.
- Individual conferences to discuss progress and areas of improvement.

Summary of survey. A summary of the survey results revealed that teachers who facilitated the *Reading Plus* program believed that they were well trained and that they implemented the program with fidelity. In addition, teachers indicated that the program improved their students’ skills in comprehension, vocabulary, and fluency. However, teacher responses were mixed regarding the program’s impact on skills involving phonemic awareness and phonics. Because of the comments submitted by the respondents, it appeared that at least some of the facilitators did not implement the program components with fidelity because not all facilitators addressed weaknesses through individual or small group practice. Also, some responses indicated that the facilitating teachers did not understand the concepts of phonemic awareness or phonics. It is this evaluator’s opinion, based on the information in the study, that if all teachers were adequately trained and if they all implemented the program as directed with true fidelity, teachers would have (a) indicated an understanding of all five skill components in the program, and (b) noted that they recognized and responded when students displayed phonics or phonemic awareness weaknesses.

With regard to non-verbal behaviors, teachers noted both positive and negative behaviors among students. Primary positive non-verbal behaviors indicated that students displayed a more positive attitude and confidence as their reading improved and goals were attained, as well as stronger physical control of head and eye movements during reading. Primary non-verbal

negative behaviors involved frustration when not accomplishing goals, rushing through the activities, and losing focus. Because students with disabilities may exhibit shorter attention spans or difficulty with neurological processing, it was to be expected that students would display some frustration during challenging academic work. A display of confidence in the ability to read was a strong indicator of success on the part of the student. Also, when the student changed physical habits, such as head movement during reading, it was apparent that the program impacted the students' ability to process information more comfortably.

Teachers also listed a variety of incentives that were successfully used throughout the program, such as certificates, sweet treats, and free time. These incentives were offered as rewards for appropriate work and progress and served to stimulate students' interest in completing work toward the next level for accomplishing goals.

Quantitative data. Quantitative data were collected from three schools in Moore County, North Carolina. Data collected from the schools included eight Students with Special Needs at Cameron Elementary, 29 Students with Special Needs at New Century Middle School, and 36 Students with Special Needs at Pinecrest High School. The total number of special needs students submitted for this study was 73.

Accurate implementation of the *Reading Plus* program included specific components required for student success (*Reading Plus* Glossary of Terms). *PAVE*™, which stands for Perceptual Accuracy/Visual Efficiency, was a two-part warm-up activity of each *Reading Plus*™ session. The activity enabled the student to improve visual-perceptual skills through two components, *Scan* and *Flash*. Visual-perceptual skill was the student's ability to interpret and give meaning to letters, words, or symbols. *Scan* required the student to scan and count letters or numbers that move across the screen in order to improve visual coordination, directional attach,

visual discrimination, and instant recognition. The second activity within the *PAVE*™ process was *Flash*, during which the student viewed a set of characters that flashed on the screen and then typed the characters, thus encouraging the student to absorb visual information quickly and then replicate it.

Guided Reading™ (GR) was the primary component of the *Reading Plus*™ system that allowed the student to practice silent reading through structured, scaffolded passages. This process allowed the student to acquire new words, skills, or knowledge. The student chose a story, followed skill directions, and answered comprehension questions. The student's Guided Reading Rate (G-Rate) was assessed as he or she read text within a guided window that moved from left to right across single lines. The speed of the window that guided the student's eyes (the guided text window) was determined by the student's Reading Placement Appraisal (RPA™) results. If the student scored at least 70%, he moved to the next story and the speed became incrementally faster. Students also read within a timed but self-paced format. During this period, the student's silent reading rated was assessed at an Independent Rate (I-Rate). Students were encouraged to record their own rate scores for both information and intrinsic motivation purposes on a Guided Reading Record Sheet.

The Cloze Plus™ component was a vocabulary program, which increased vocabulary and comprehension skills, for students with vocabulary levels of 1–8 as assessed by the Reading Placement Appraisal (RPA). Each lesson is 4–16 paragraphs on a social studies or science topic.

Reading Around Words™ (RAW™) was a vocabulary program component for students who scored at vocabulary levels of grades 4–12, as assessed by the RPA™. Students worked through reading passages to build vocabulary through the context and used context clues to

determine meaning of unfamiliar words. RAW vocabulary activities were included on levels D through L.

In addition, optional program components, which were not components of the automated *Reading Plus* program, included Word Memory™ for lower level students in grades one through three who were not yet ready for Guided Reading™ and also D-Code™, an optional program for students who needed practice in decoding skills with the 60 major letter clusters in the English language. Students sounded out letters and letter clusters in whole words for additional practice to improve phonics and phonemic awareness skills.

When a student achieved the rate goal and comprehension goal of a current level, the program automatically generated an award certificate for the student and moved the student to the next, more difficult content level. This process was known as Level Up.

The *Reading Plus* methodology included critical components for success with the *Reading Plus* program. These components included (a) an intense schedule of three to five times per week, (b) 45-minute sessions in a lab environment, (c) extrinsic motivation rewards and recognition, (d) adequate computer work stations; and (e) student monitoring by the teacher through one-on-one encouragement with individual program adjustments.

The elementary level. At the elementary level, data from eight special needs students were included in the study. This included data from six Students with Disabilities along with data from two students identified in the area of Academically or Intellectually Gifted (AIG). Of the six with disabilities, five were identified in the category of Learning Disabilities (LD) and one was identified in the category of Autism (AU).

Lexile data revealed that four of the five LD students (80%) improved reading growth in Lexile scores by an average of +227.25 points. One LD student (20%) declined from 604 to 526

resulting in a regression of 51 points. Figure 4 shows a comparison of the beginning scores and end-of-year scores for elementary students with Learning Disabilities who were included in the remediation program.

Data from the AU student results revealed an 86-point decline in Lexile scores from 902 to 816. Figure 5 illustrates the decline in scores for the AU student. Sixty-seven percent of the total elementary Students with Disabilities showed academic progress in reading skills after participating in the *Reading Plus* program, while 33% of the total elementary Students with Disabilities declined according to Lexile scores as tested by the Scholastic Reading Inventory (SRI). Of the two AIG students included for acceleration, both declined with an average decline of 82 points. Figure 6 reveals a comparison of beginning-of-year and end-of-year scores for the AIG students.

The middle school level. At the middle school level, 29 students with special needs received intervention through the *Reading Plus* program. This special needs group included 27 identified Exceptional Children (EC) who were served through Individual Education Plans (IEPs); one student identified through Section 504 of the Rehabilitation Act of 1973 and served through a written 504 plan, and one student identified as AIG in math only. Figure 7 shows the growth in Lexiles for all AU students in the middle school group. Of the total students who improved, the average Lexile growth for all students with disabilities was +147.35.

With respect to individual grade levels, Figure 8 shows that eighth-grade students averaged +144.45 points, while seventh-grade students averaged +170.6 points and sixth-grade students averaged +126.99 points. The student identified as AIG improved from 621 to 778 indicating a gain of +157 points. The student identified via Section 504 improved from 662 to 764 indicating a gain of +102 points. Within the total group of special needs students, eight

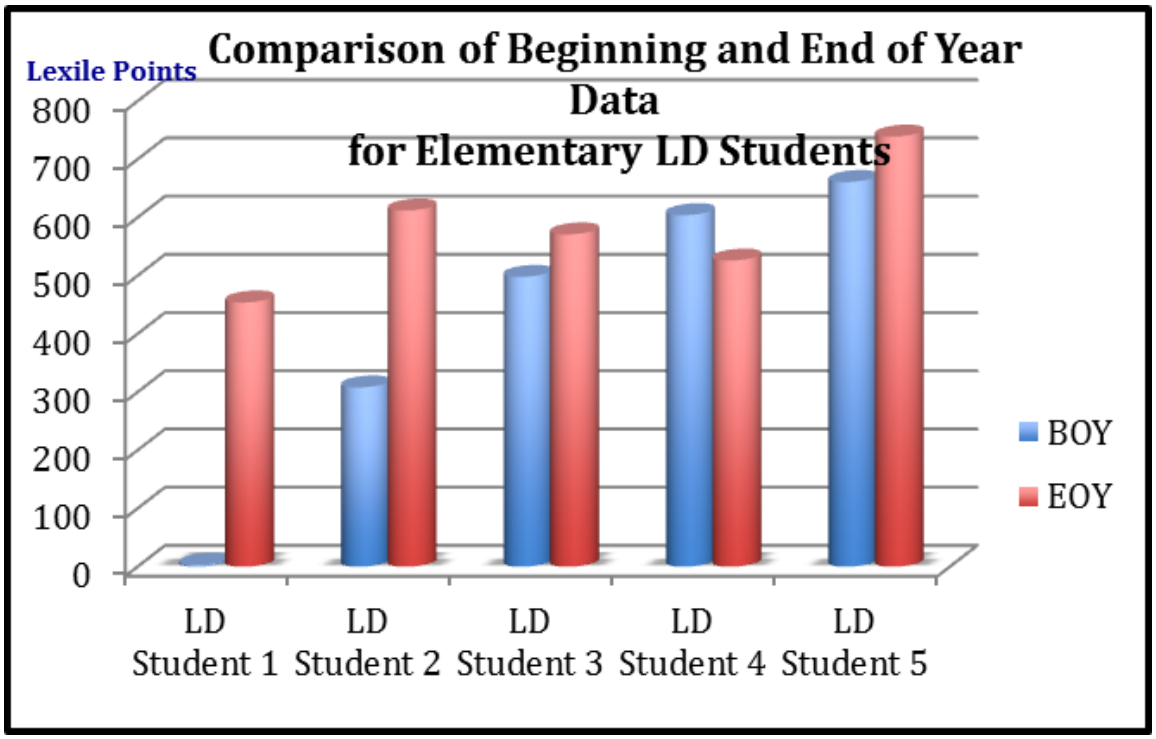

Figure 4. Comparison of beginning and end of year data for elementary LD students.

Note. Data for elementary LD students revealed that 80% of these students improved an average of 226.5 points while 20% of these students declined 51 points. Gains ranged from 73 to 451 points of improvement using the Lexile scale.

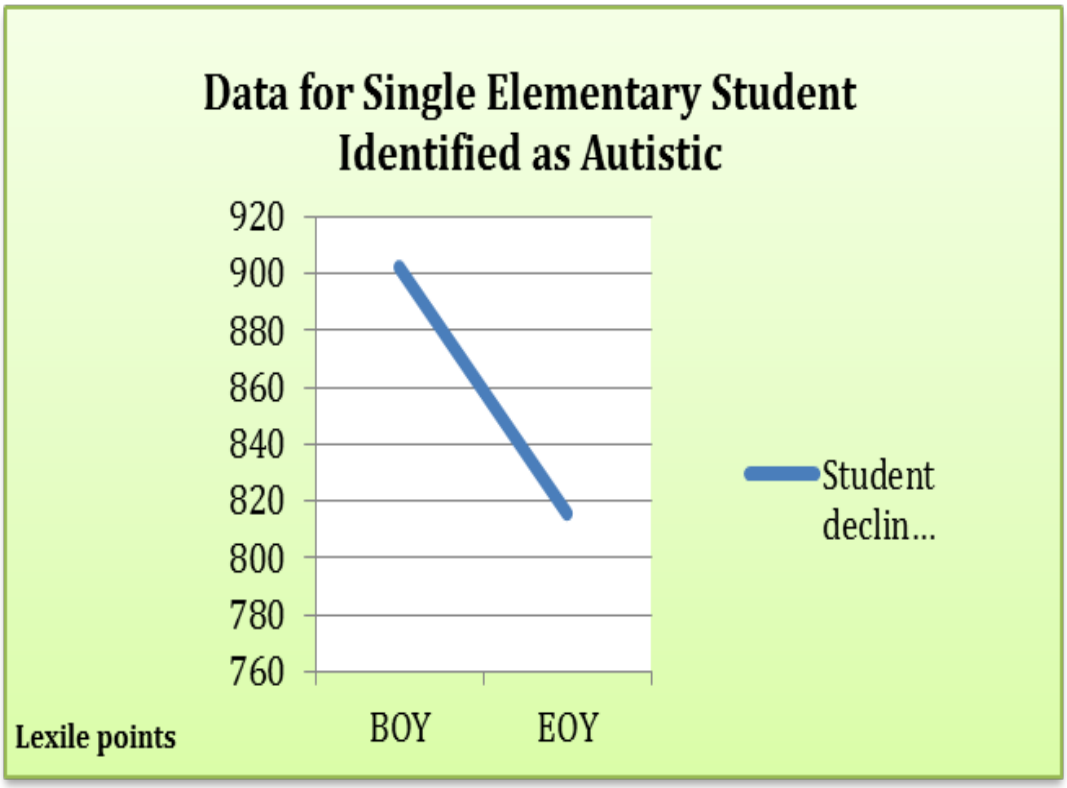

Figure 5. Data for single elementary student identified as autistic.

Note. One student formally identified for service through the category of Autistic was included in the elementary data. This student's pretest Lexile score was 902 and posttest score was 816. No further information was available to assist in analyzing the drop in score.

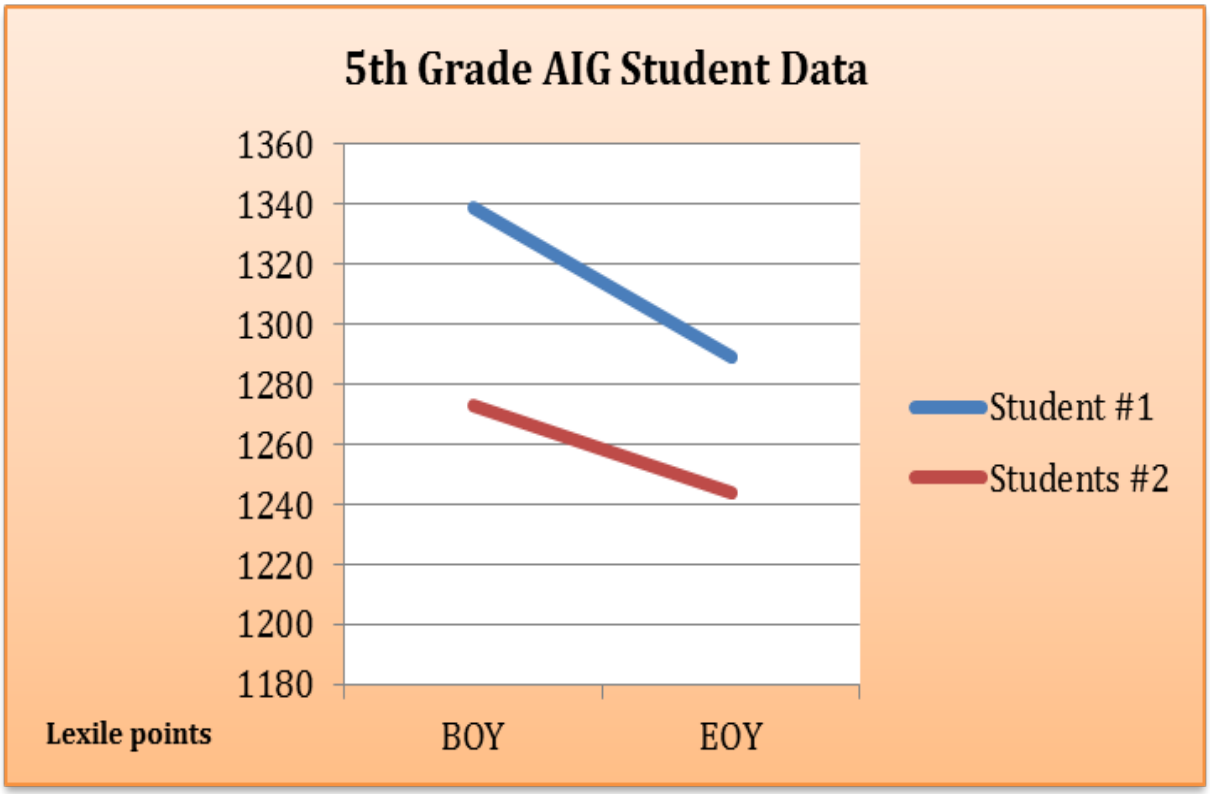

Figure 6. 5th grade AIG student data.

Note. Fifth grade AIG students included in the program for the purpose of acceleration only declined in Lexile score by an average of -39.5 points.

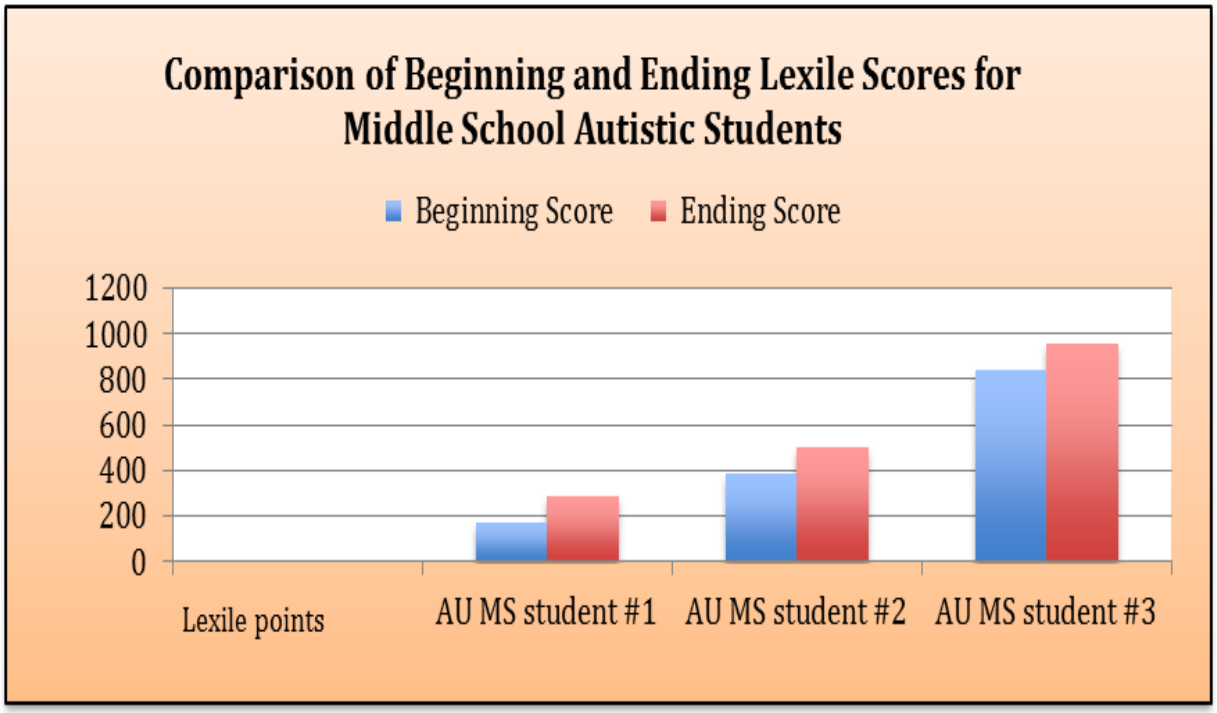

Figure 7. Comparison of beginning and ending Lexile scores for middle school autistic students.

Note. All students identified as Autistic at the Middle School demonstrated improved results in reading Lexiles using *Reading Plus*.

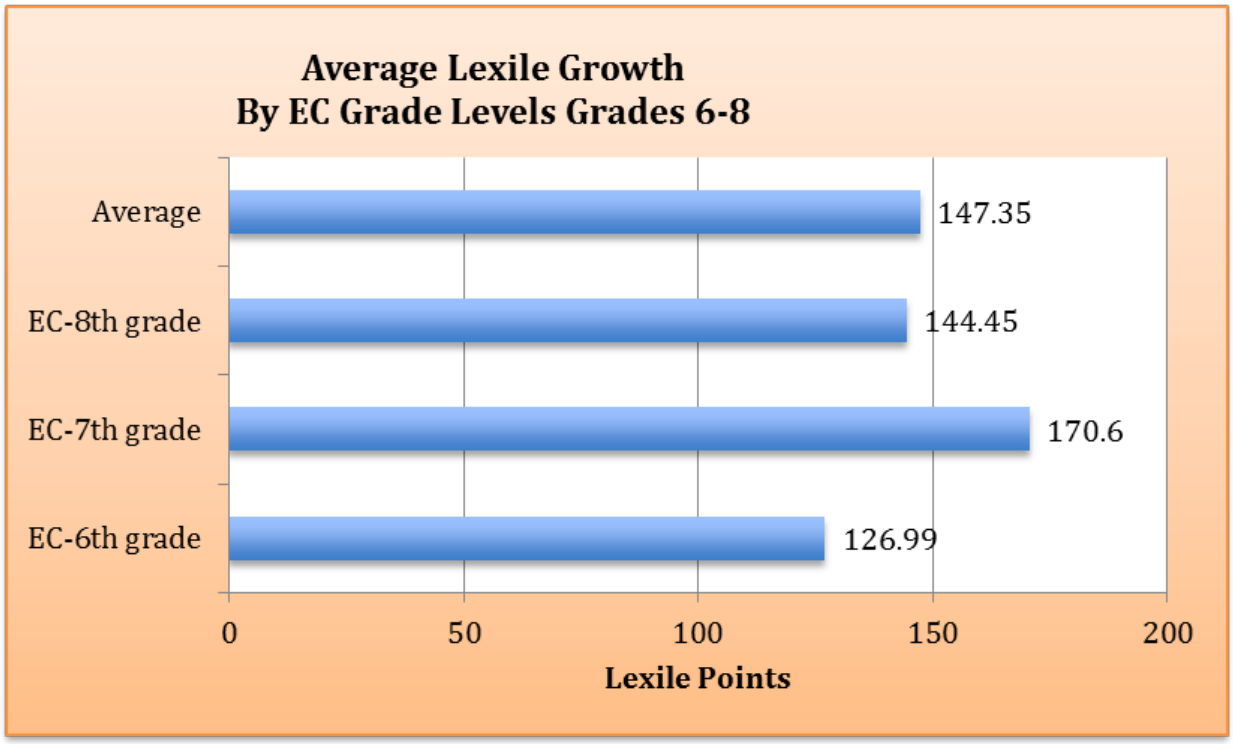

Figure 8. Average Lexile growth by EC grade levels 6-8.

Note. While EC students in grades 6, 7, and 8 improved their scores, the average for all middle school EC students was an improvement of 147.35 points.

students (24%) declined in Lexile scores with an average decline of -89.61 points. Figure 9 shows that data indicated that 77.14 % of the total group of identified middle school special needs students made academic progress after participating in the *Reading Plus* reading program, while 22.86% resulted in Lexile posttest scores that showed decline. Overall, the data (see Figure 10) revealed that Students with Disabilities at the middle school level made about the same level of progress as their non-identified counterparts.

The high school level. At the high school level, 36 special needs students identified as Exceptional Children (EC) participated in the *Reading Plus* program. Eight students, or 22% of the total, were self-contained (SC) students. These students received special education services for at least 61% of the day and were with nondisabled peers during 39% or less of the instructional day. Only one student (3%) in the SC groups was enrolled in the Occupational Course of Study (OCS) program. All data were available for the self-contained and OCS students with the exception of the end of program test. Posttest results allowed the researcher to determine gains or losses for this group of lower functioning students. Because the final assessment for the self-contained students was missing from the data, the required data were incomplete; therefore, the group of self-contained students was not discussed in connection to other high school data. However, the evaluator believed it was necessary to draw conclusions from the data received and reserved comments for the observations and recommendations section of this chapter.

The remaining 28 high school special needs students for whom complete data were reported received EC resource service as academic support while in the inclusion program. In inclusion, these students were in regular classes with nondisabled peers 40% or more of the day.

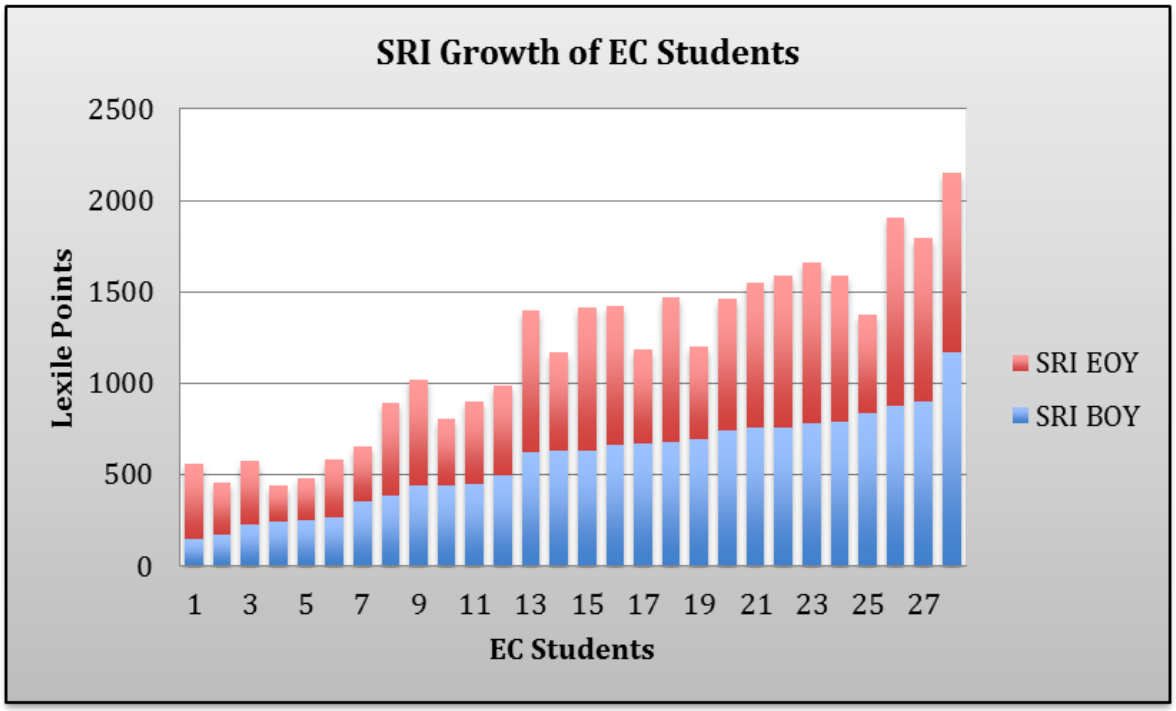

Figure 9. SRI growth of EC students.

Note. Data show 77.14 % of the total group of identified middle school special needs students made academic progress after participating in *Reading Plus*.

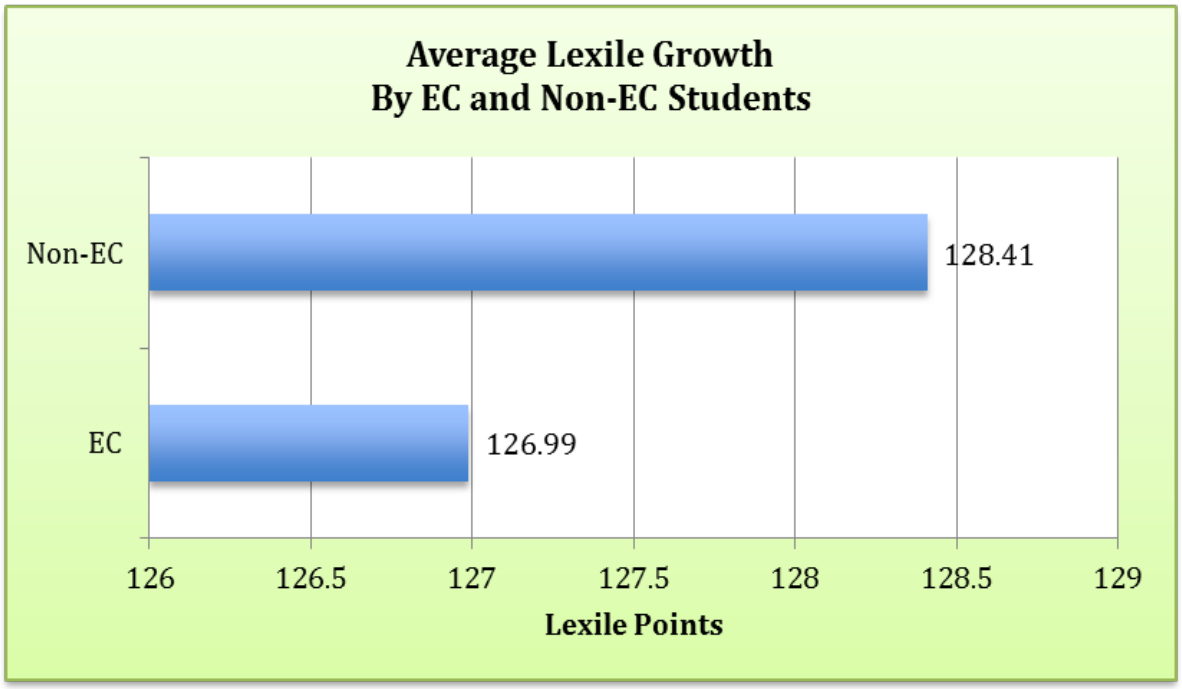

Figure 10. Average Lexile growth by EC and non-EC students.

Note. Data revealed that the *Reading Plus* program was as effective at the Middle School level for Exceptional Children as it was for non-identified, regular education students.

According to the data, 94% of these identified EC students showed academic gains after participating in the *Reading Plus* reading program while 6% showed no gain.

End of Grade (EOG) English I scores were available for ten students. By comparing eighth-grade EOG scores to English I EOG scores, the data revealed that 70% of the students improved Lexile scores by an average increase of 98.6 points. Thirty percent declined in Lexile scores by an average drop of 43 points. The evaluator had anticipated that all students included in the data would have participated in EOG tests but found that 36% of the EC students were included in the English EOG tests while 44% of the inclusion students did not have English EOG scores. It should be noted that an EC student is dependent on the IEP committee to determine participation in regular EOG or end-of-year alternate assessments.

At the high school level, data for one AU student was included, and this progress is noted in Figure 11. The student completed 87 RAW lessons (vocabulary) and improved 5 levels; 143 lessons in GR (silent reading with comprehension) and improved 7 levels; and 107 lessons in CLOZE (vocabulary and comprehension) and improved 2 levels. This student did not take the English EOG.

Two HI students were included in the data which indicated an average gain of 3.5 levels in RAW after an average of 40 lessons. With an average of 103 lessons, the data showed 2.5 levels average gain in CLOZE. In GR, HI students averaged 111 lessons with 2.5 levels average gain. Figure 12 shows data for Hearing Impaired students.

Data for 13 LD students indicated that this group averaged 41.9 lessons in GR with an average gain of 3.9 levels and averaged 118.9 lessons in CLOZE with an average gain of 1.8 levels. The group also averaged 49.8 GR lessons with an average gain of 5.1 levels, as demonstrated in Figure 13.

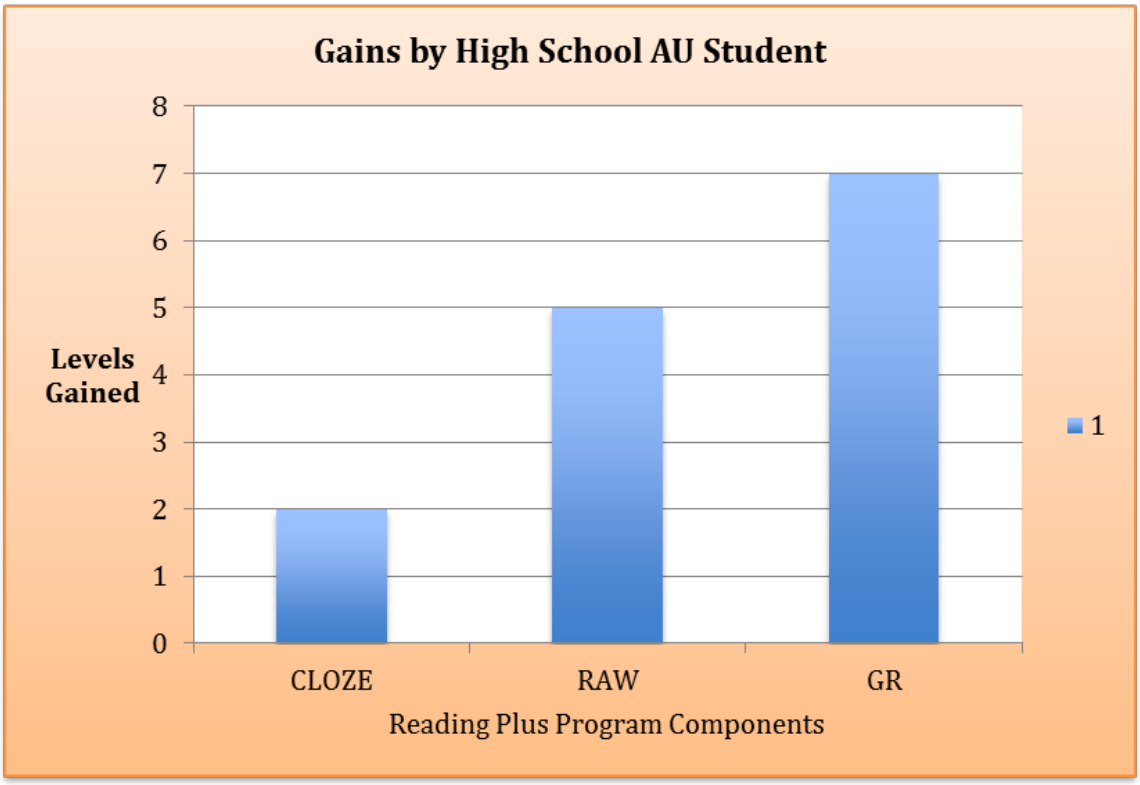

Figure 11. Gains by high school AU student.

Note. The high school AU student demonstrated gains in three key program components of *Reading Plus*.

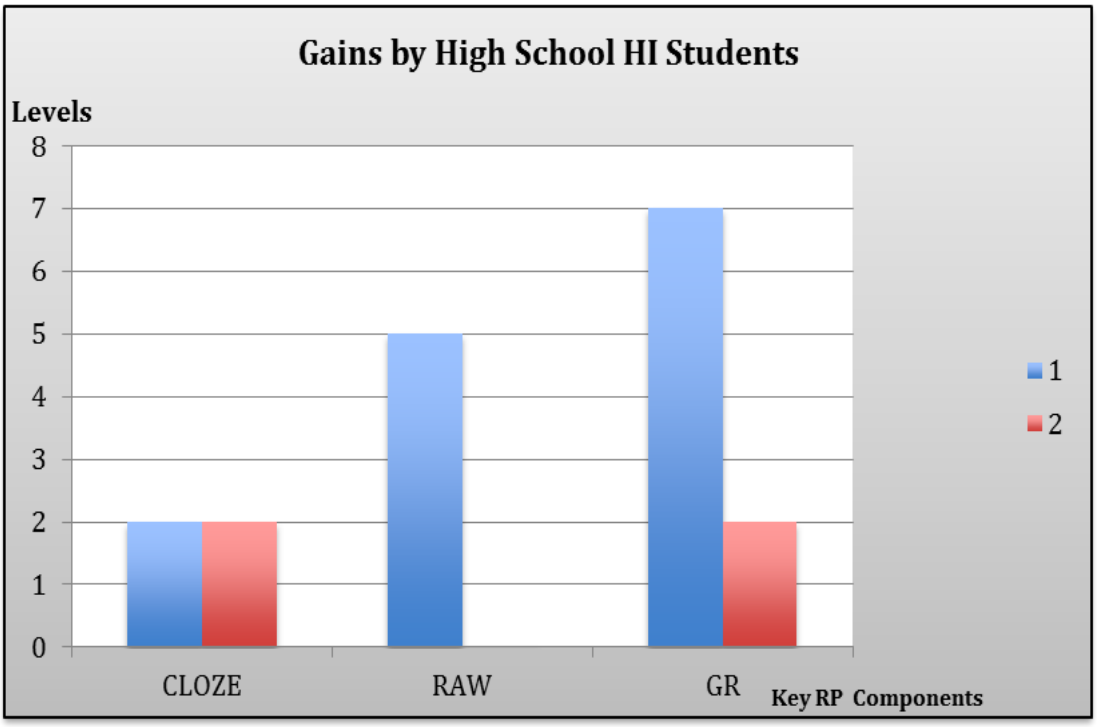

Figure 12. Gains by high school HI students.

Note. Hearing Impaired students showed greatest gain in Guided Reading.

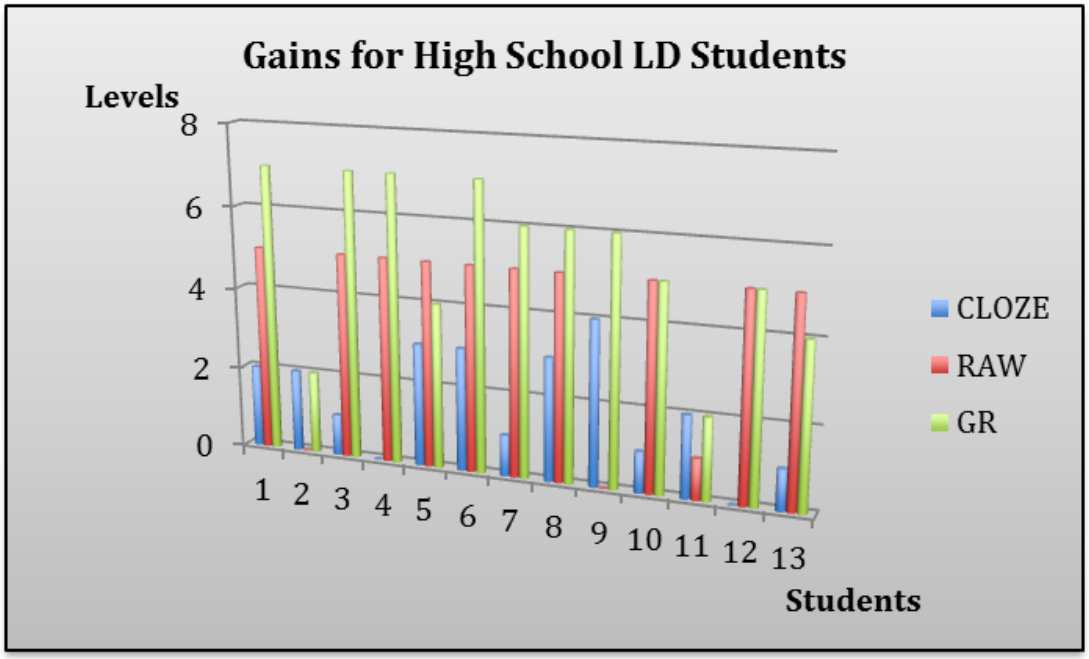

Figure 13. Gains for high school LD students.

Note. LD students at the high school level posted stronger gains in silent reading and vocabulary components.

Providing

The third step of the evaluation model was that of providing a report of the program results and achievements to the Superintendent and the Director of Exceptional Children that was both descriptive and analytical. Because the purpose of program evaluation was to relate objectives to outcomes and, thus, assess the overall worth of the program in terms of its effects, the following question was important to answer: "To what extent, if any, did the *Reading Plus* program impact student academic achievement in reading for students with disabilities who were enrolled in the program based on student Lexile scores generated from the Scholastic Reading Inventory (SRI)?" Further, this information was intended to provide administrators in the school system with valid information for future decisions regarding this particular program and its relationship to reading achievement for elementary, middle, and high school students, as well as students with disabilities throughout these three levels.

Based on perceptions of teachers who implemented the program, it was believed that *Reading Plus* improved all or most students' reading abilities and that *Reading Plus* impacted NC End-of-Grade test scores by improving the students' reading efficiency and reading stamina. This program evaluation of the *Reading Plus* program was intended, in part, to prove or disprove this perception based on the use of pretest and posttest comparison data. This study was intended to investigate data and attitudes regarding the *Reading Plus* intervention program for struggling readers and the role of *Reading Plus* instruction in developing 21st century-ready students within Moore County Schools.

However, during the study, another question continued to be raised: "Does *Reading Plus* provide a financially efficient option with regard to (1) other programs that are similar and (2) the impact on student achievement?" A *Reading Plus* quote proposal shown in Appendix F

notes that the per seat cost for middle school is $44 per student with an administrative fee of $1,200 that includes 24 hours (four hours for each of six sessions) of facilitator training on site, additional webinar training, unlimited toll free support for individual teachers, and ongoing individual training, as well as all web-based reports. Based on this quote, the total cost of one student seat in the program was $56, which included $44 per seat for web-based instruction plus $12 administrative fee to cover teacher training, support, and reports.

Another current reading remediation program, *Fast ForWord*, offered a single student license in Language for $900 and a single license in Reading for $500 in 2010, according to What Works Clearinghouse. Multiple license discounts for Language were available but Reading licenses were firm with no quantity discounts. *Fast ForWord* is a remediation program that recommends at least 30 minutes per day for 5 days each week to attain proficiency.

In contrast, a 2013 proposal for *System 44* (20 licenses for a middle school for students reading below the 400 Lexile level) and READ 180 (120 licenses) was offered for three middle schools in a neighboring LEA near Moore County. The contract included licenses for three middle schools, 3 ½ days of teacher training, classroom materials, software licenses, web hosting, and ongoing teacher support with coaching and data. Cost of the three-school contract was $247,783. Therefore, it appears the cost of this program was $82,594.33 per school (READ180) or $690.49 per student.

Conclusions

1. Through the survey, teachers reported that they received training and, therefore, understood the goals and implementation process of the program. They further noted that they implemented the program with fidelity, so teachers believed that they were trained in the program and that they taught according to *Reading Plus* expectations. However, a review of teachers' responses to the areas of phonemic awareness and

phonics revealed that some facilitators were not addressing these areas appropriately. *Reading Plus* training required teachers to monitor each student's progress and to work individually or with small groups on specific phonics issues throughout implementation of the program. Thirty percent of the teachers who responded to the survey did not respond to the phonemic awareness or phonics questions while 20% noted that they had not reached that area yet. This led the evaluator to believe that some teachers may not have implemented the program with fidelity even though they believed they did so. Optional program components were available to address phonics and phonemic awareness needs and these were included in facilitator training. Also, teachers were encouraged to work individually or in small groups with students who needed additional attention on any skill. The *Reading Plus* lab should include a combination of students who are engaged in the program at computers, as well as students who are working individually or in small groups with the teacher when necessary or appropriate. It is the opinion of this evaluator that, if the *Reading Plus* program is implemented correctly, the facilitators should be just as engaged in teaching as the students are in learning.

2. All of the teachers who responded to the survey noted their belief that the *Reading Plus* program had improved their students' comprehension skills.
3. All of the teachers who responded to the questions about vocabulary indicated that their students had grown in this area.
4. All of the teachers who responded to the survey noted their belief that the *Reading Plus* program had improved their students' reading stamina.

5. Teachers scored the impact of phonics and phonemic awareness on their students at a lower than average level. It appears that some teachers did not use the optional programs for these areas, that some teachers may not have used small group and individual instruction as instructed in training, or that some teachers did not have a firm grasp of practices for phonics and/or phonemic awareness.
6. Two-thirds (67%) of the elementary Students with Disabilities demonstrated gains in Lexile scores after participating in *Reading Plus*.
7. Over three-fourths (77%) of the middle school Students with Disabilities demonstrated gains in Lexile scores after participating *Reading Plus*.
8. Ninety-four percent (94%) of the high school students who had complete data demonstrated gains in reading through Lexile scores or *Reading Plus* program components.
9. Students identified as autistic (AU) were included at all three levels. Though one AU student at the elementary level declined in Lexile scores, all AU students at the middle and high school levels demonstrated gains in GR, RAW, and CLOZE after participating in *Reading Plus*. Further study is necessary before drawing conclusions about success of *Reading Plus* on elementary AU students.
10. AIG students who were included at the middle school level because of weak reading skills demonstrated improvement after using the program.
11. AIG students at the elementary level who were included in the program for the purpose of acceleration at the elementary level did not improve. This was unexpected because consultants in the *Reading Plus* program encouraged inclusion of AIG students for this purpose.

12. Careful attention should be given to inclusion of any AIG students. These students should be included in the discussion of the purpose of their participation in this program (remediation versus acceleration), and they should be given ample opportunity whenever possible to choose the material they read within the structure of the *Reading Plus* program. For students who are included for acceleration purposes, a special reward system or healthy competition could be created for AIG students who are participating in the program. In addition, opportunities for these students to discuss their reading through literature circles will serve as motivation.
13. High school OCS students made notable growth in reading skills based on EOG English scores, as well as *Reading Plus* data, and posted the highest gains in silent reading and vocabulary.
14. Self-contained students at the high school level participated in *Reading Plus*, but data for these students was incomplete. Based on available data, self-contained students at the high school level did not appear to participate in the program according to program guidelines, though this cannot be confirmed without further study. Self-contained (SC) students averaged 45.37 sessions for the semester as opposed to the inclusion students who averaged 108.33 sessions in the *Reading Plus* lab. *Reading Plus* training recommends three to four sessions of 45 minutes per week. There could be several reasonable explanations for their limited participation, such as scheduling or behavior and/or attention issues related to student disabilities; however, the data stimulates the following questions:
    A. What was the purpose for including the self-contained students in *Reading Plus*?

B. Were the teachers who worked with the self-contained students in the *Reading Plus* lab fully trained to facilitate the program?

C. Why did the SC group receive fewer sessions in the *Reading Plus* lab than the inclusion group or the non-EC group?

D. How is the *Reading Plus* lab scheduled?

E. Did all students, including Students with Disabilities, have equal access to the *Reading Plus* program lab?

Because this research did not include discussions with teachers or face-to-face surveys, this evaluator would need further information from teachers who facilitated the program with this group to determine (a) the goals of participation by the self-contained students, and (b) if the self-contained students received equal access to the *Reading Plus* lab, or (c) if behavior issues impacted the amount of time spent in the lab. It was difficult to determine if self-contained EC students would benefit from the *Reading Plus* program based on data received for this study. Further study would be needed with this defined group of students before conclusions regarding benefit could be drawn.

Recommendations

1. Careful attention should be given to inclusion of any AIG students. These students should be included in the discussion of the purpose of their participation in this program (remediation versus acceleration), and they should be given ample opportunity whenever possible to choose the material they read within the structure of the *Reading Plus* program. For students who are included for acceleration purposes, a special reward system or healthy competition could be created for AIG students who are participating in the program. In addition, opportunities for these students to discuss their reading through literature circles will serve as motivation.

2. During training, as well as throughout implementation, oversight should include attention to the process of addressing phonemic awareness and phonics so that students are supported individually or in small groups with oral reading, decoding, and fluency. While teachers noted that they administered the program with fidelity, it was clear that some did not adequately address phonemic awareness or phonics problems.
3. Each participating school should include trained EC teachers and, if possible, central staff of Exceptional Children as consultants to the implementation process for the purpose of monitoring student progress and needs, as well as making informed decisions regarding participation of special needs students in the *Reading Plus* program. Collaboration with the EC department is essential for oversight of special needs.
4. Every school that implements the *Reading Plus* program should designate an administrative monitor who is responsible for scheduling of the EC students into the computer lab, regular walkthroughs of the *Reading Plus* program classes, scheduled conferences with the program facilitators to monitor lab time, to review progress and identify issues that need attention, and to review student data from *Reading Plus* reports.
5. Students with Disabilities may possess not only visual processing difficulties but also motor processing lags that may impact their ability to type quickly when they respond to activities such as the *Flash* segment. Motor speed must be taken into account before adjusting the program for the student or, particularly, before removing a student from the program. Because the program includes a speed component, special

needs students may require additional support or adjustment. These students should not be removed in haste because the program does not appear to be working for them. Rather, the speed should be decreased while analyzing the student's struggle, and motivation should be offered to the student to remain in the program if possible.

6. All students included should be given equal access to lab facilities and the *Reading Plus* program. SWD are entitled to the same facilities and programs that regular education students receive, so no limits should be placed on their access to computer facilities, program components, or qualified instructors. Any access or advantage that is given to regular education students should also be given to SWD.
7. An EC student identified to participate in the *Reading Plus* program should be ensured the same time and support of any non-EC student. The program should be delivered with fidelity to this student population by a trained *Reading Plus* facilitator who is committed to adhering to the guidelines of the program, but who also understands the unique needs of these students and is able to adjust the program to meet student needs. Insincere use of the *Reading Plus* program, or any other remediation program, only serves as a way to fill time rather than provide viable academic instruction. The *Reading Plus* program should not be used as a computer-time reward for Students with Disabilities but rather should be implemented with complete fidelity and seriousness of purpose.
8. Every teacher who facilitates the program must be afforded thorough training and support. In addition, these teachers must understand all components, automated and optional, and must be encouraged to use any component necessary for reading improvement. Further, facilitating teachers must be committed to implementing the

program with complete fidelity and remain engaged and vigilant as they monitor and teach students who are working in the program.

9. As a result of expectation and evaluation standards for both teachers and principals, North Carolina now includes a school accountability growth composite in yearly evaluations. In the evaluation process for both teachers (Standard 6) and principals (Standard 8), school faculty and staff are held accountable for student test scores at the end of the school year. Standard 6 for teachers and Standard 8 for principals populate automatically in the web-based summative evaluation document to include achievement scores (class scores for EOG teachers and school scores for principals). Therefore, teachers and principals are held accountable for data and student improvement. With this in mind, schools should be able either to choose programs and materials that they believe match the needs of their students, or give significant input into the choice of programs and materials, because they will be held accountable for school level results.
10. In all schools, the principal's expectations drive the instructional process and school success. School leadership is essential to every aspect of the school. The principal who understands and monitors the *Reading Plus* program is more likely to see his or her students reap the benefits of the program, so it is important for the principal and school leadership team to support this program, monitor its implementation, and review and discuss the results on a regular basis.

Summary

In summary, the *Reading Plus* program, which is based on medical research connecting eye-movements and reading, appears to work successfully in grades four through nine for SWD.

More than three-fourths of the special needs students who used the *Reading Plus* program at the elementary level improved their Lexile scores, while special needs students improved and performed just as well as their non-identified counterparts at the middle school with two-thirds of the middle school SWD demonstrating improvement in reading. At the high school level, special needs students revealed highest gains in vocabulary and silent reading.

Through a qualitative survey designed to assess professional opinion about the impact of the program, teachers who facilitated *Reading Plus* indicated that the program was successful for their students and particularly improved their students' sustained reading, which is an important skill for success on end-of-year and end-of-course tests. Teacher opinions also supported the quantitative data that revealed student success in vocabulary and comprehension.

There are multiple reading remediation programs on the consumer market and some are as expensive as $500, $700 or $900 per student. However, the Reading Plus program is approximately one-tenth of the cost of other programs and is successful at remediating skills of mild to moderate special needs students. Based on the results of this study, the *Reading Plus* program is cost-effective and successful in improving the reading skills of Students with Disabilities at the elementary, middle, and high school levels.

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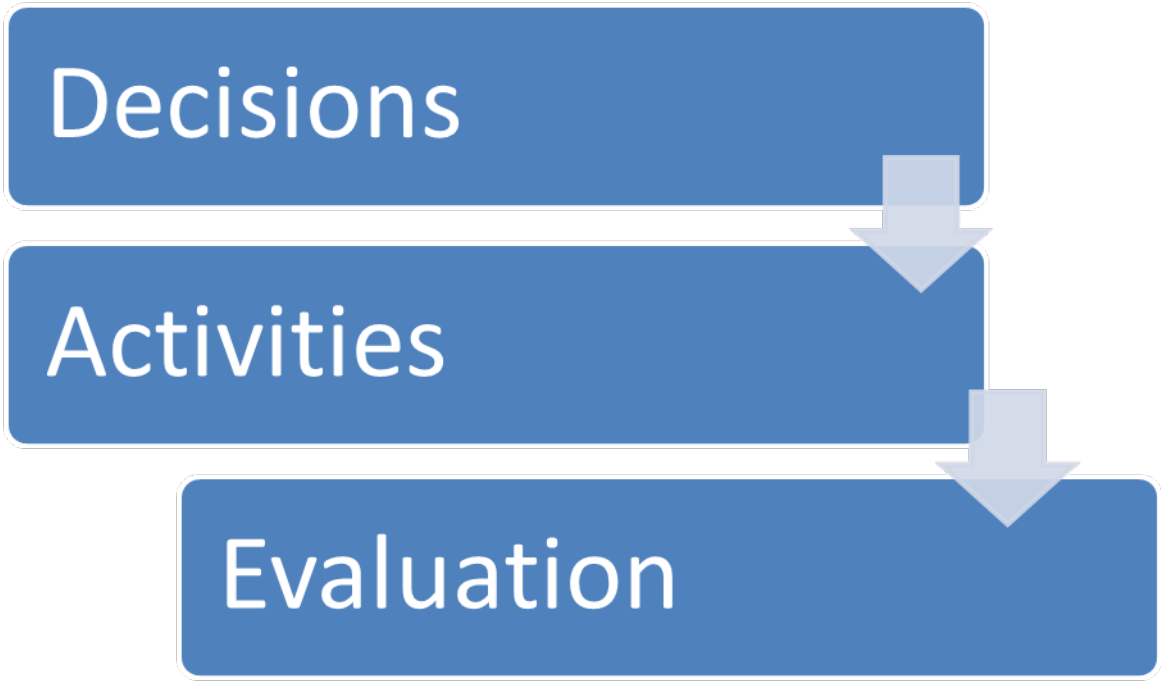
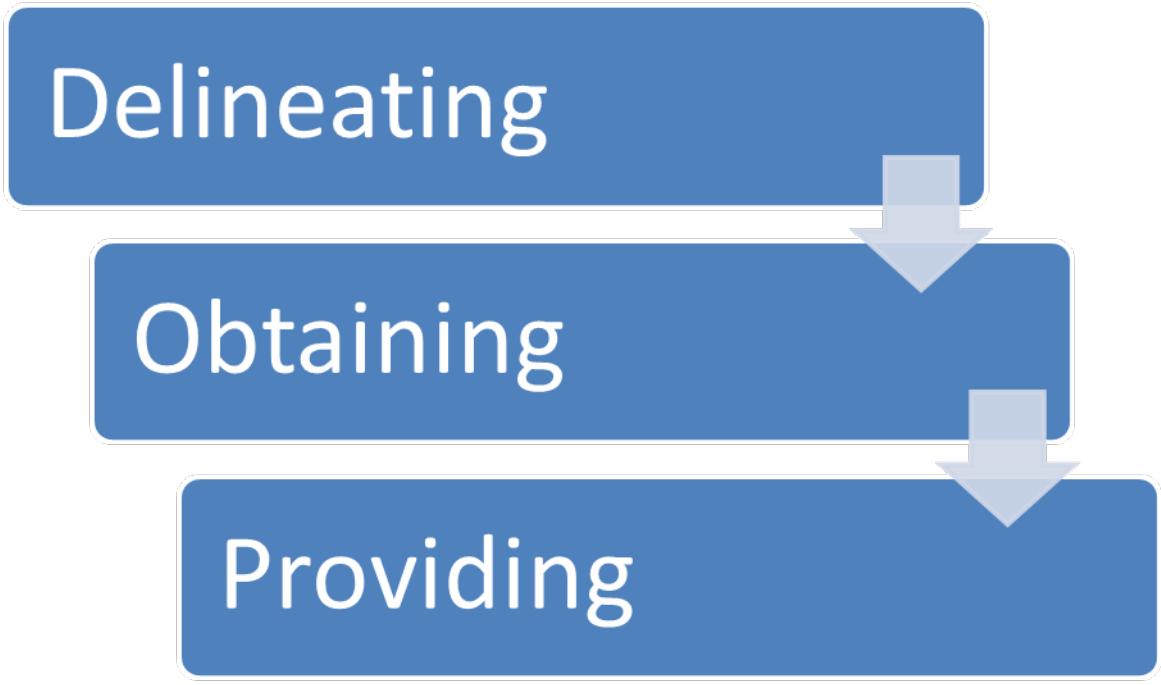
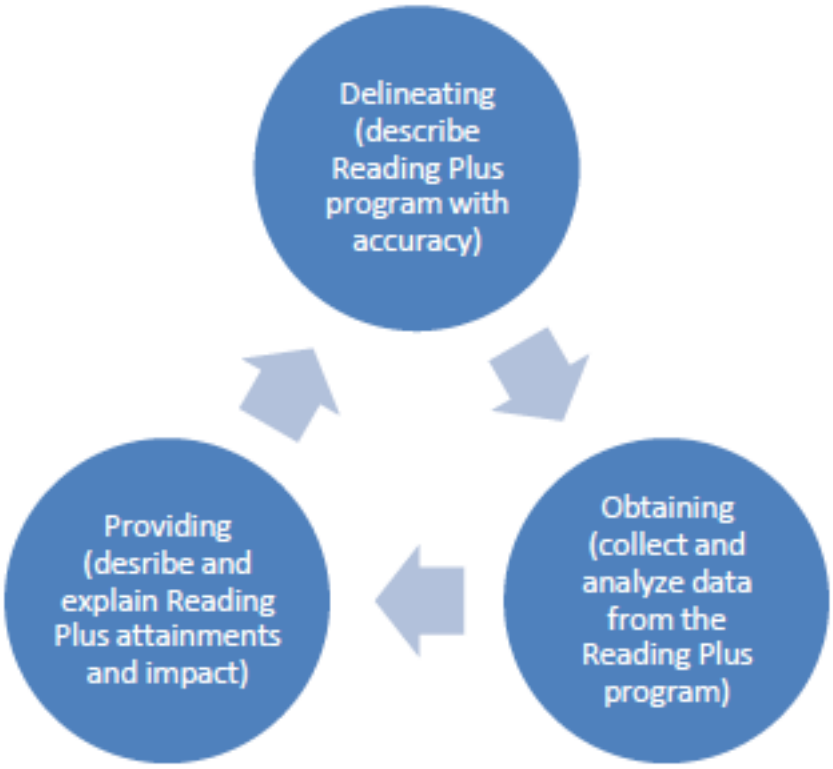
APPENDIX A: CONTEXT-INPUT-PROCESS-PRODUCT (CIPP) DECISION MODEL



APPENDIX B: PROGRAM EVALUATION CYCLE



APPENDIX C: CIPP RELATIONSHIP OF EVALUATION TO DECISION-MAKING



APPENDIX D: SUPERINTENDENT'S REQUEST FOR PROGRAM EVALUATION

MOORE COUNTY SCHOOLS
Growing to Greatness

January 30, 2014

Dr. William A. Rouse, Chairperson
East Carolina University
Department of Educational Leadership
College of Education- 210 Ragsdale Building
Mailstop: 515
Greenville, NC 27858

Dear Dr. Rouse:

I am writing in support of Robin Calcutt, Dale Buie, Joel County and Emilie Simeon to complete a program review of the "Reading Plus Program" from the elementary, middle, high school and of students with disabilities perspectives for their dissertation project. While several schools in our system have purchased the Reading Plus Program, I am requesting that they use data from Cameron Elementary School, New Century Middle School and Pinecrest High School because these schools have consistently implemented the program and have also collected data for school use. They will work in a "problem of practice" method so that their research centers on an issue relevant to the work here in Moore County Schools. They are excited, as I am, that their study will benefit our own students and school system.

I would also be honored to serve on their dissertation committee. I understand that I will need to be approved by the university to serve in this capacity. I look forward to receiving future information on this process. If you have any questions, please feel free to contact me at 910-947-2976 or email at aspence@ncmcs.org.

Sincerely,

Aaron C. Spence, Ed.D.
Superintendent of Schools

ACS: cbm

P.O. Box 1180, Carthage, North Carolina 28327 • ph: 910.947.2976 | fax: 910.947.3011 • www.ncmcs.org

APPENDIX E: TEACHER SURVEY QUESTIONS

1. Did you receive adequate training and support on the implementation of the *Reading Plus* program?
2. Did you implement the Reading Plus program with fidelity according to the *Reading Plus* implementation guide?
3. Based upon your observations, did the *Reading Plus* Intervention Program impact the students' comprehension skills?
4. Based upon your observations, how did the *Reading Plus* Intervention Program impact the students' comprehension skills?
5. Based upon your observations, did the *Reading Plus* Intervention Program impact the students' fluency skills?
6. Based upon your observations, how did the *Reading Plus* Intervention Program impact the students' fluency skills?
7. Based upon your observations, how did the *Reading Plus* Intervention Program impact the students' vocabulary skills?
8. Based upon your observations, did the *Reading Plus* Intervention Program impact the students' phonemic awareness skills?
9. Based upon your observations, how did the *Reading Plus* Intervention Program impact the students' phonemic awareness skills?
10. Based upon your observations, did the *Reading Plus* Intervention Program impact the students' phonics skills?
11. Based upon your observations, how did the *Reading Plus* Intervention Program impact the students' phonics skills?

12. Based upon your observations, did the *Reading Plus* Intervention Program impact students' reading stamina?
13. Based upon your observations, how did the *Reading Plus* Intervention Program impact students' reading stamina?
14. List any positive non-verbal behaviors that you observed in students as they used the *Reading Plus* program.
15. List any negative non-verbal behaviors that you observed in students as they used the *Reading Plus* program.
16. As a *Reading Plus* facilitator, what motivation strategies did you use with students participating in the *Reading Plus* program?

APPENDIX F: *READING PLUS* QUOTE PROPOSAL

Date January 15, 2013

AREA Administration

AGENDA ITEM(S) READ 180/System 44 Proposal

CONTACT PERSON(S) Dr. Jeff Moss

Agenda Report

1. **READ 180** - There are 120 READ 180 licenses for each middle school. The READ 180 costs include licenses (which we will own after this initial purchase), student materials, teacher materials and the classroom library/materials. These materials are used to set up the R180 experience for the students in a designated classroom.

2. **System 44** - There are 20 System 44 licenses for each middle school. Again the costs include licenses (which we will own after this initial purchase), student materials, teacher materials and the classroom library/materials. System 44 is for those students who are reading below the 400 Lexile level.

3. **HOSTING** - Hosting is included in the proposal. This is based on the number of students in R180 and System 44 plus a 1 time set up fee. This is the only required reoccurring costs that you will need to pay annually.

4. **Consulting and data analytics** - In-class coaching – 2 days per month to allow the consultants to work with the 3 schools. They can normally visit 2 schools per day but not 3 schools so the consultant needs 2 days per month for a total of 16 days.

Also included is the data analytics to deliver a high level data report.

The total is $247,783 and includes all the best practices for a successful implementation at the 3 middle schools. The licenses and hosting are needed to service the number of students at each school. Included is the consulting that is needed to support these 3 schools in year one. It is critical to support these schools during the first year of implementation with the monthly coaching/consulting visits.

Administration is recommending that the Board approve the READ 180/System 44 proposal.

Suggested Motion-I move that the Lee County Board of Education approve the READ 180/System 44 proposal for the three middle schools in the amount of $247,783.

SCHOLASTIC

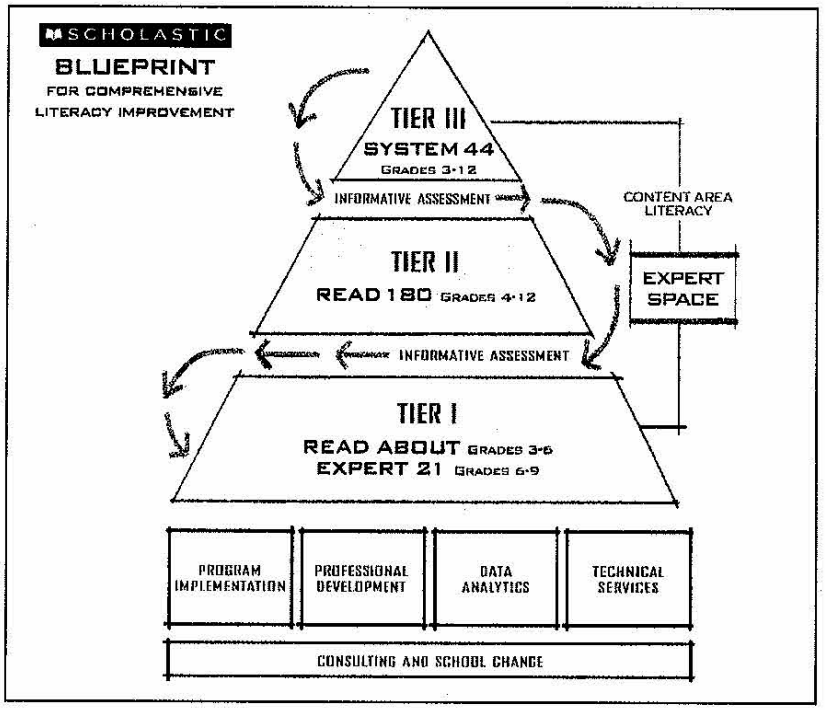
Lee County School District

Scholastic's Tiered Intervention Solution
Servicing (420) Below Proficient Students

PART 1: INTRODUCTION

We are honored to have the opportunity to work with Lee County School District School District in helping to raise reading achievement, and are pleased to share the following *Tiered Intervention Treatment Program Plan* servicing (420) below proficient students. The goals of the materials and services in this intervention treatment proposal necessary to build sustainable literacy achievement are:

- Tiered Intervention Materials and Services for below proficient students
- Initial Training for teachers, coaches and leaders to ensure an efficient implementation
- Ongoing in-classroom implementation support to help accelerate student gains
- Technical support to ensure the technology components of the implementation run flawlessly



Scholastic believes that a solid literacy foundation for all students is a critical "gateway" to further reforms. We will work collaboratively with you to develop a comprehensive literacy improvement plan, implementing a delivery model that includes *READ 180*, the most thoroughly documented and proven program for low-achieving students; *System 44*, a foundational reading program designed for the *most* challenged readers; highly recommended Tier I supplemental instructional materials; and a consistent assessment/management system to drive accountability. These programs are the most thoroughly tested and proven solutions used in schools today, and have a proven track record of success.

It is not enough to know change is needed and identify concerns and deficiencies. It is not enough to offer general ideas to apply to non-related curricula and assessments. A unique, powerful approach offered by this proposal is the recommendation of specific literacy intervention programs that interface with other assessment, professional development, and overall philosophy around school reform and student improvement.

Scholastic programs employ the power of technology to motivate students and to provide for structured engagement. Students who are not drawn to print media, but voluntarily spend hours on the computer, will use a tool they value to master skills they need. Care is taken so that students see themselves in diverse characters that encourage, provide feedback, and otherwise appear in anchor videos and literature. In addition to research-based instructional features designed to support struggling students using Scholastic programs, technology itself offers personalization, privacy, nonjudgmental coaching and feedback, and the ability to easily pick up where the student left off, minimizing embarrassment for the student who falls behind due to absence or ability.

Summary of Students Served: Scholastic's recommended Tiered Intervention Treatment Program Proposal will support (420) below proficient students consisting of (60) Tier III beginning reader students, (360) Tier II students who are one or more years below proficient from (3) schools.

SCHOLASTIC

SUMMARY OF TIERED PROGRAMS & SERVICES

This Scholastic Tiered Intervention Proposal includes the necessary materials and services to support (420) below proficient students consisting of (60) Tier III beginning reader students, (360) Tier II students who are one or more years below proficient from (3) schools.

Tiered Intervention Instructional Materials

- (3) *System 44* Beginning Reader Student Classroom Materials
- (60) *System 44* Beginning Reader NEW Student Software Licenses and *System 44* books
- (2) *READ 180* Stages A, B or C Classroom Materials
- (360) *READ 180* Stages A, B or C NEW Student Software Licenses and Student *rbooks*
- (2) *READ 180* Next Generation Upgrade Packages Stages A, B or C
- (420) *Scholastic Reading Inventory (SRI)* and (420) *Scholastic Reading Counts* Software Licenses
- (300) *Scholastic Phonics Inventory (SPI)* Software Licenses

Tiered Intervention Services Best Practices

- Two days of initial on-site Initial Implementation Training for new teachers
- One day of Day 2 Implementation Training for new teachers
- One, half-day on-site Leadership Training for new school leaders
- (1) visits of in-classroom support per *READ 180* and/or *System 44* teacher per month (8 Months)
- Onsite, telephone, online technical support and relevant software updates

The total investment of materials and services to support (420) below proficient students:

***System 44* Student Software Licenses, Teacher & Student Materials**	$42,000
***READ 180* Student Software Licenses, Teacher & Student Materials**	$153,600
Classroom Setup, Hosting set up and hosting per student, Technical Support & Management	$13,200
Intervention Teachers Ongoing In Classroom Support, Coaching and Data Analytics	$38,983
Total Savings: $84,700	
Total Cost Scholastic Tiered Intervention Solution	**$247,783**
Deferred Billing Option Down Payment Payable Net 30-60	$123,891.50
Deferred Billing 2nd Payment (Due w/in 12 Months of PO)	$123,891.50

APPENDIX G: INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

From: umcirb@ecu.edu
Subject: RX: Your Exempt study has been approved
Date: June 3, 2014 at 8:23 AM
To: SIMEONE10@students.ecu.edu

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board Office
4N-70 Brody Medical Sciences Building· Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office **252-744-2914** · Fax **252-744-2284** · **www.ecu.edu/irb**

Notification of Exempt Certification

From: Social/Behavioral IRB
To: Emilie Simeon
CC: Jim McDowelle
Date: 6/3/2014
Re: UMCIRB 14-000487
PROGRAM EVALUATION OF READING PLUS: STUDY OF READING ACHIEVEMENT FOR STUDENTS WITH DISABILITIES IN MOORE COUNTY SCHOOLS

I am pleased to inform you that your research submission has been certified as exempt on 6/3/2014 . This study is eligible for Exempt Certification under category #1 - 4 .

It is your responsibility to ensure that this research is conducted in the manner reported in your application and/or protocol, as well as being consistent with the ethical principles of the Belmont Report and your profession.

This research study does not require any additional interaction with the UMCIRB unless there are proposed changes to this study. Any change, prior to implementing that change, must be submitted to the UMCIRB for review and approval. The UMCIRB will determine if the change impacts the eligibility of the research for exempt status. If more substantive review is required, you will be notified within five business days.

The UMCIRB office will hold your exemption application for a period of five years from the date of this letter. If you wish to continue this protocol beyond this period, you will need to submit an Exemption Certification request at least 30 days before the end of the five year period.

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418

Study.PI Name:
Study.Co-Investigators: