ABSTRACT

Joel M. County, PROGRAM EVALUATION OF *READING PLUS*: STUDY OF THE IMPACT ON READING ACHIEVEMENT FOR NINTH-GRADE STUDENTS IN MOORE COUNTY SCHOOLS (Under the direction of Dr. James McDowelle). Department of Educational Leadership, March 2015.

The following is a program evaluation of the *Reading Plus* program in Moore County Schools from southern North Carolina and its impact on reading achievement for ninth-grade students. *Reading Plus* is a valuable asset that may be utilized to increase student ability to read. The Reading Plus program increases the degree of phonemic awareness, phonics, fluency, reading stamina, comprehension, character recognition and recall, vocabulary acquisition skills, and Lexile levels of students when the program is implemented with fidelity.

The results of this study show that students who spent sufficient time on task, with each component of the program, demonstrated growth in all the areas mentioned above. Teachers who implemented this pilot were overwhelmingly pleased with the student outcomes and the program itself. The outcomes of this program evaluation were so impressive that the Reading Plus program is now being implemented at Riverside High School in Durham Public Schools, located in central North Carolina.

PROGRAM EVALUATION OF *READING PLUS:* STUDY OF THE IMPACT ON READING ACHIEVEMENT FOR NINTH-GRADE STUDENTS 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 (2014) would be retained, remediated during the fall of the next school year (2014), 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 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

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

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 typesand 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 (National Reading Panel, 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 National Reading Panel (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 National Reading Panel of 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 National Reading Panel 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 National Reading Panel'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 National Reading Panel (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 (Traxler et al., 2012).

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. (National Reading Panel, 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 National Reading Panel (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 National Reading Panel 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 National Reading Panel (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 National Reading Panel (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, p. 7). The NRP (2000) 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" (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 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 National Reading Panel (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 National Reading Panel (2000) regarding research-based reading skills in The Report of the National Reading Panel: Teaching children to read (National Reading Panel, 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] (2007) 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 National Reading Panel (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 National Reading Panel 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 (National Reading Panel (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 National Reading Panel (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 National Reading Panel (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.

Summary

Early reading methodologies included focus on reading by sight and a whole word approach while later reading instruction recognized the significance of associating letter sounds and symbols. The 1930 *deaf mute* method of reading silently one word at a time was slow, methodical, and focused more on reading sight words but little on phonics (Rodgers, 2001). By 1955, Rudolf Flesch claimed in his book, *Why Johnny Can’t Read – And What You Can Do About It*, that phonics was the key to successful reading. A National Reading Panel of 2000, established by the United States Department of Education and comprised of reading experts, determined five key components necessary for reading instruction. These included phonemic

awareness, phonics, fluency, vocabulary instruction, and comprehension. The work of this panel impacted classroom instruction across the country as well as development of instructional materials for teaching reading.

Concurrently, research was conducted regarding the medical association of eye-movement and reading success. Tinker documented that reading deficiency and efficiency, as well as immature reading habits, could be identified through studying a reader's eye-movements. As research in this field continued, technology was developed that measured eye-movement in response to reading symbols and words (Williams, 2009). More recent studies focused on working memory and processing speed in relation to eye-movement and language processes (Traxler et al., 2012). Earl Taylor, James Taylor, and Carl Taylor began their eye-movement research as early as 1931 and developed the Ophathalmograph to photograph the eyes during reading and also the Metronoscope, a type of speed-reading machine intended to increase binocular coordination. In the 1960s, Earl Taylor developed the *Reading Plus* program as an instructional program for remediating reading deficiencies.

While research in the history of reading confirmed that there was no one best method for teaching reading, both technology and accountability have been shown to influence the development of reading programs. In order to evaluate effectively the impact of the Reading Plus program with regard to fluency, comprehension, and success with grade-level texts, this study analyzes the data from elementary, middle, high school and students with special needs.

CHAPTER 3: METHODOLOGY

Research Purpose

The purpose of this study is 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 seeks 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 will not be 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 focuses on the impact of *Reading Plus* on student reading achievement in elementary, middle, and high school, so that information will be available to provide an objective view of student academic progress in reading. Three schools are 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 are higher than ever before because of state and federal testing requirements (Common Core State Standards, 2012b; North Carolina General Assembly, 2011; U.S. Department of Education, 2004b). In addition, because of the budgetary and curricular concerns about intervention programs, this specific study will assist the Moore County Schools to make 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, 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 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 is 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 is 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 is determined that a program evaluation method is 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 are a relatively recent phenomenon, the process of planned social evaluation dates 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 follows 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 indicates 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 provides an effective framework for 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 delineates the *Reading Plus* program in Moore County Schools. Also following Stufflebeam's cycle, researchers will obtain pertinent information about the program and will provide 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 will focus on the product evaluation component of the CIPP model. The product evaluation component, as stated by Stufflebeam, is 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 want to know more about the product of the program. Specifically, administrators seek valid information regarding whether or not the program improves reading achievement for those students enrolled in the program based on student Lexile scores, which are generated from the SRI.

The *Reading Plus* program evaluation using the CIPP model consists of three steps initially theorized by Stufflebeam and focus on the product of the targeted program. The first step is *delineating*, which involves 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, expects reading intervention programs, including *Reading Plus*, to improve student reading achievement.

The second step in the evaluation process is *obtaining*, which results when product information is 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 are recorded at two benchmark periods. The first period is before students began the program at the beginning of the school year (August) and the second period is at the point of exit from the program at the end of the school year (June). With regard to the teachers' products, results will be gleaned from surveys that are completed by classroom teachers who facilitated *Reading Plus*. A survey will be used to gather qualitative data of observable actions of teachers who facilitated the *Reading Plus* program. The survey results are 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 is intended to support, clarify and/or explain the quantitative results. Survey data will include 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 will be provided to the stakeholders.

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

Research Setting

The research will be 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 will explore 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 in 2012-2013. The study will involve 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 are selected for this study at the request of Superintendent of Moore County Schools, Aaron Spence. They are selected because of their intense and continued involvement with the *Reading Plus* program (see Appendix E).

Study Participants

Teachers will participate in the study. Participating teachers will be those that had specifically implemented the program at one of the three studied schools. Student data originates from 2012-2013 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 are not included. Students who were in the program but did not yield data for one full semester or one full year of intervention are excluded. No student names will be used and students will not be 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.

In 2012-2013, elementary student data was 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) 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

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	3	≤ 330	331–337	338–349	≥ 350
(Starting with the 2007–2008 school year)	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. Source: 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. Source: MetaMetrics, Inc. (2013a).

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 is located in Cameron, North Carolina. In 2012, 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 will involve 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 is New Century Middle School (NCMS) also located in Cameron, North Carolina. In 2012, 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 in 2012, 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 will be 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 will be collected for review and comparison. The Scholastic Reading Inventory is 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 is a system for measuring students' reading levels and matching readers to appropriate instructional level text. The Lexile Framework uses a common metric to evaluate both reading ability and text difficulty. By placing both reader and text on the same scale, the Lexile Framework allows educators to forecast the level of comprehension a student will experience with a particular text and to evaluate curriculum needs based on each student's ability to comprehend the materials. Data will be 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 and Scholastic Reading Inventory tests and the post-test reading tests will be obtained and the growth or lack of growth for a particular student will be determined based on student Lexile scores. As required by the Moore County

Schools Internal Review Board (MCSIRB), all student data will remain confidential. Students enrolled for less than the nine-month school year will not be included in the data analysis.

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

A pilot administration of the survey will be administered to five teachers to establish construct validity. Open-ended, short answer responses will be 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 will be asked to volunteer to participate in the survey. The survey titled *Reading Plus* Observations is a sixteen-item questionnaire designed by the researchers and will be administered through a free online survey tool (Google forms). The questionnaire is based upon the key characteristics, belief statements and the CCSS guidelines. It includes an introduction, demographic, attitudinal, behavioral, short answer, and closing instructions. The scale type is a continuous scale (strongly agree to strongly disagree) and categorical scales that ranks items of importance (Creswell, 2013). The participants will be assured that their comments will be kept confidential and their participation is voluntary. The survey will be distributed to a specific selection of 14 teachers via email communication in May 2014 and the participants are requested to complete it within ten days. This selection of teachers includes 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 are selected based upon their role with the students participating in the *Reading Plus* program. This survey will be

normed for use by the Moore County School District teachers by piloting the instrument that includes short answer.

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

The researchers will use student achievement data that is not personally identifiable by individual student names. All data collected from the county will be housed on a flash drive that is accessible only to the researchers and the Director of Dissertation. The flash drive will be locked in a secure file cabinet when not being used for research purposes. Names of participants will not be used during any phase of the research. Unique identifiers will be used to protect all participants. Individual students will not be identified, interviewed, or questioned by the researchers. Student data collected from the district will be housed on a disc that only the Director of Dissertation can 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 will be included in the student data analysis group. Students who were not enrolled in the *Reading Plus* Intervention program will not be included. Students who were in the program but did not yield data for one full semester and/or year of intervention will be excluded. The data to be collected is 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 will not name Moore County Schools in final reports. Informed consent by students is not necessary since students will not be contacted or identified. The target date for Board presentation may be scheduled for August 2014.

Data Analysis

The assessment data will be analyzed with regard to progress by grade level, gender, race, and students with disabilities. Forms of data will include 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 will be analyzed for the students enrolled in the *Reading Plus* program. Data will be analyzed for outcomes and trends. This information may determine if student progress and growth can be attributed to their participation in *Reading Plus*.

The constant environmental factors are curriculum subject matter, student grade level and reading abilities, instructional strategies, teacher experience, and a teacher's attitude and abilities. Dependent environmental factors are the CCSS, class time length, and course length. The researchers will note 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 will be collected using an online survey tool (Google forms) using a Likert scale as well as open-ended responses. Results will be 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 is 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 are selected, each of which serves students in need of reading intervention based on NC End-of-Grade test scores and Lexile scores. This study seeks to provide a review of reading scores, Lexile levels, and teacher information regarding implementation of the program and fidelity to implementation. While quantitative data will include students' reading scores, qualitative data—which will be gleaned from surveys completed by teachers who facilitated the program—is necessary to support or explain the resulting scores. Because the district superintendent had requested evaluation of reading intervention programs, this program evaluation focuses 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 in 2012-2013.

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

CHAPTER 4: RECOMMENDATIONS BASED UPON LITERATURE REVIEW, DATA COLLECTION, AND ANALYSIS

Review of Previous Chapters

In 2002, the United States Department of Education reported what many feared; that regardless of years of educational reform, students continue to struggle in reading (Grigg et al., 2003). Students in grades 4–12 were not reading at grade level. These fears were confirmed by the 2006 ACT, Inc. study titled "Reading between the Lines," where evidence was presented to support an increase in reading requirements for all age groups. The pertinence of this study was furthered with the implementation of the Common Core curriculum that required students to read and understand material within complex literary and informational texts (Common Core State Standards, 2012b). School-age students who do not read well may have more difficulty with both academic assignments and reading for pleasure.

The growing reading demands of college, workforce training programs, and workforce citizenship have risen over the past 50 years, while K-12 academic texts have become less rigorous. 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 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.

Lesnick et al. (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, as well as 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 et al., 1992), and that third-grade students with poor skills in word recognition were not likely to improve their reading skills with any significance by the end of eighth grade (Felton & Wood, 1992). Partially as a result of this type of research there are now mandates of *No Child Left Behind* and the 2012 North Carolina State Law which dictate that students must read on grade level by the end of third grade.

The National Reading Panel (NRP) of 2000 established by the United States Department of Education and comprised of reading experts, determined five key components necessary for reading instruction:

- phonemic awareness
- phonics
- fluency
- vocabulary instruction
- comprehension

The work of this panel impacted classroom instruction across the country as well as development of instructional materials for teaching reading. Prior reading methodologies included a focus on reading by sight and a whole word approach while later reading instruction recognized the significance of associating letter sounds and symbols. The 1930 Deaf Mute Method of reading silently one word at a time was slow, methodical, and focused more on reading sight words but little on phonics (Rodgers, 2001). By 1955, Rudolf Flesch claimed that phonics was the key to successful reading.

Earl Taylor, James Taylor, and Carl Taylor conducted research in the area of eye-movement and reading success that documented reading deficiency and efficiency, as well as

immature reading habits, that could be identified through studying a reader's eye-movements. As research in this field continued, technology was developed that measured eye-movement in response to reading symbols and words (Williams, 2009). More recent studies focused on working memory and processing speed in relation to eye-movement and language processes (Traxler et al., 2012). They developed in 1931 the Ophathalmograph to photograph the eyes during reading and also the Metronoscope, a type of speed-reading machine intended to increase binocular coordination. While research in the history of reading confirmed that there was no one best method for teaching reading, both technology and accountability have been shown to influence the development of reading programs. By the 1960s, Earl Taylor developed the *Reading Plus* program as an instructional program for remediating reading deficiencies.

The problem of practice that necessitated this Reading Plus program evaluation was that there was no local data to support the use of the *Reading Plus* program for reading intervention, though at least three schools have been using it for the purpose of improving student reading achievement. The issue is further compounded by the fact that schools and administrators across the system have chosen a variety of different intervention programs without LEA coordination or internal analysis resulting in at least 13 different reading programs in 23 schools across the district. Therefore, the purpose of this program evaluation is to determine the impact, if any, of the Reading Plus intervention program on the reading achievement of students within the Moore County Schools so that the administration could make informed decisions about the program.

Moore County Superintendent, Dr. Aaron Spence, directed schools to provide data to show the effectiveness of their selected reading intervention programs. For streamlined evaluation, each school provided pre and/or post data using scores or information the school deemed important to this purpose. This evaluation 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. The schools selected served students in need of reading intervention based on the North Carolina End-of-Grade test scores and Lexile scores. This evaluation sought to provide a review of reading data and scores, Lexile levels, and teacher information regarding implementation of the program and fidelity to implementation. Quantitative data included students' reading scores and 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, the program evaluations 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. This particular program evaluation focused only on ninth-grade students, using Daniel Stufflebeam's research design called Context-Input-Process-Product (CIPP).

Introduction to Chapter 4

In the evaluation of the Reading Plus Program utilized in Moore County Schools, data for analysis will be extracted from the eighth grade North Carolina End-of-Grade Reading scores, the Reading Plus Program and literature, teacher participant responses from an online survey, and the ninth grade North Carolina End-Of-Course exam in English. The definitions and explanations of the Reading Plus data was taken from the glossary provided with the program. In addition to the academic data analysis there was be a limited cost benefit analysis conducted to assist the LEA with decisions on cost efficiency and comparisons to determine the value of the Reading Plus program. The data used in the cost benefit analysis was gathered from two similar programs being utilized at two other schools within Moore County Schools.

Fundamentals of the Program

The *Reading Plus* program requires each student to begin the program by taking the Reading Placement Appraisal (RPA). This appraisal determines the beginning level in each of the components of the program. Additionally, at the beginning of each session there is a warm-up activity called the Perceptual Accuracy/Visual Efficiency (PAVE™). This activity provides students with opportunities to practice recalling a series of scanned and flashed characters that build visual skills and visual memory. These skills are notably the most basic orthographic skills necessary for fluent and efficient reading and improved spelling. The data for this program evaluation is compiled from the components of the Reading Plus program.

Flash and Scan Rates

Flash and Scan rates are used by the *Reading Plus* program to determine visual skills and visual memory necessary for fluent and efficient reading and improved spelling. Flash rates are determined by students viewing a set of flashed characters and then typing what they saw. The range of characters recalled was between four and seven, consistent with the standard for visual memory of plus or minus two. Scan rates are determined by students counting the number of targets, either numbers or letters, appearing across the screen from left-to-right. The speed of the three random elements is determined by the student's grade level and increases, remains stable, or decreases based on correct responses. A one hundred twenty lines per minute rate is set as the maximum, far above the tracking requirements for most silent reading (Taylor Associates, 2009). Figure 1 displays the year-end scan rates of the participating students and from the initial scan rates; by the end of the school year, 71 students (44%) reached the maximum and the majority of the entire group had achieved close to the maximum of 120 lines per minute (lpm). Students who achieved close to the 120 lpm rate demonstrated the visual skills to read fluently.

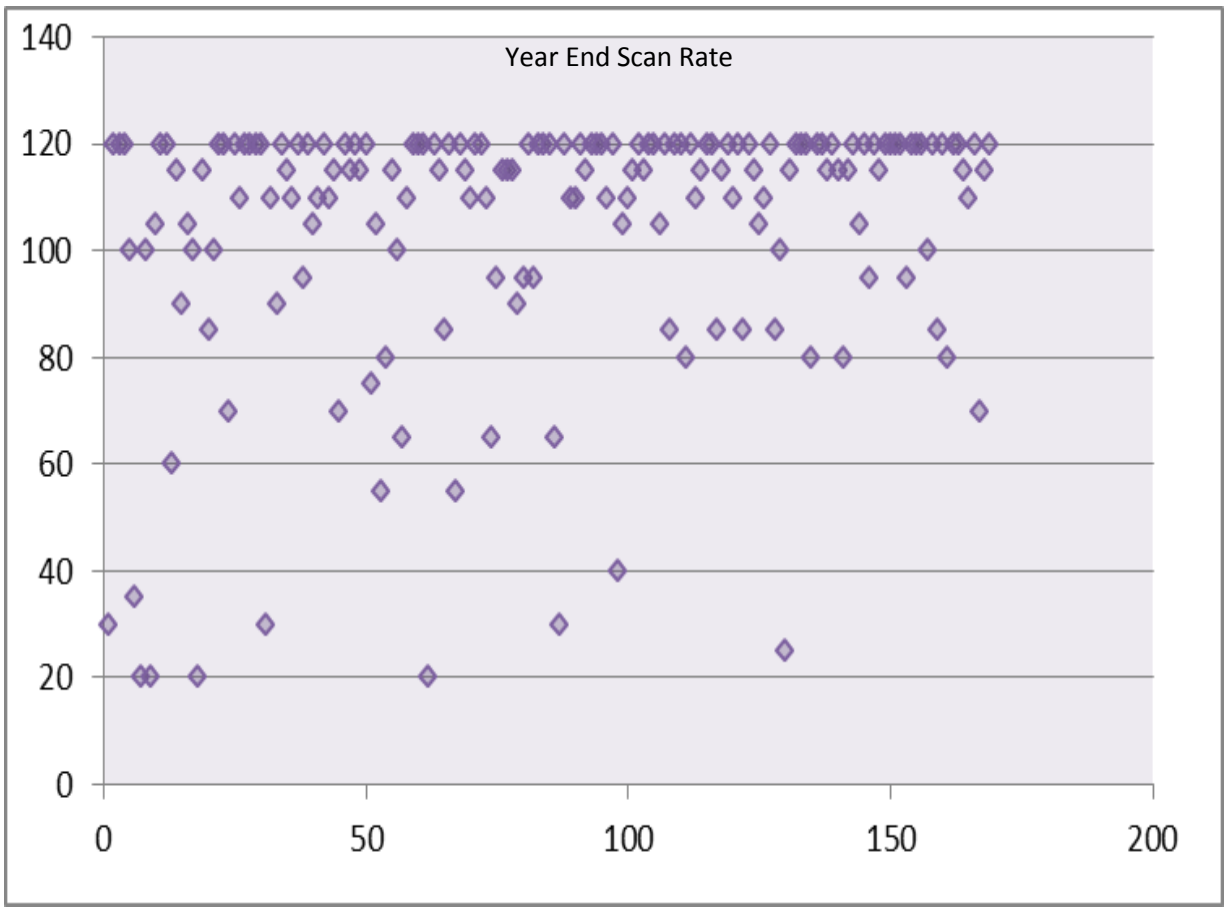


Figure 1. Year end scan rate.

Review of the Data

This evaluation of the Reading Plus program selected eighth grade students to participate in a pilot of Reading Plus based on the student's North Carolina EOG scores in Reading. These scores were not only used to identify students for this pilot, but also as a bench mark for determining achievement at the end of their ninth grade year. Students who scored at a level one (scale score of 349 or below) or level two (scale scores of 350-357) were considered not proficient and to be performing below grade level; therefore these students who were in this category were placed in year-long classes that were a combination of English Language Arts and Reading Plus instruction respectively. The year-long class met each day, for 90 minutes, with students receiving 45 minutes of Language Arts instruction and 45 minutes of Reading Plus instruction. One hundred and sixty-nine students participated in this pilot of which 43 scored at a level one, 93 scored at a level two, and 30 students with missing scores. The students with missing scores were either a result of the 8th grade students not taking the North Carolina EOG Reading assessment or the scores somehow did not get recorded. Either way, these 30 students who participated were identified based on teacher recommendation and past achievement data. These data show that males represented 55% (93) of the student participants while females represented 45% (76). African American students were the largest sub-group represented with 53% (89) student participants. Of the African American students, 60% (53) were males and 31% (53) of the total group was African American males (see Table 4).

Guided Reading (GR) Component

Another component of the Reading Plus program entails a guided reading element that provides the students activities to practice his/her silent reading in a structured manner. Students choose a story to read with key vocabulary terms and then answer comprehension questions.

Table 4

Demographic Characteristics of Students

	African American (%)	Hispanic (%)	White (%)	Asian (%)	Other (%)	Male (%)	Female (%)	African American Male (%)	Total
Participants	(53%) 89	(11%) 18	(31%) 52	(0%) 0	(4%) 7	(55%) 93	(45%) 76	(31%) 53	169
Pinecrest High School	(23%)	(6%)	(65%)	(1%)	(4%)	(51%)	(49%)	(22%)	1,916

The stories fall into one of two categories; the I-Rate (IR) or the G-Rate (GR) format. In the I-Rate format, a line at a time drops on the screen until a text box or paragraph is formed. Students set their own pace in reading these lines but it is still timed and will eventually time out. The GR format allows the reader to scan the text from left to right with initial speed determined by the reading placement appraisal. For this reason, GR rates are somewhat faster than IR rates. The student must score a minimum of 70% to move forward through the program in the GR format. As the student scores at 70% or above the rates of each of these formats increases. The students' reading achievement is apparent when comparing the initial GR rates (see Table 5), in words per minute (wpm), to the current GR Rate (see Table 6).

Researchers Taylor, Frackenpohl, and Petee (1960) identified grade level norms as 214 wpm for ninth graders and 224 wpm for tenth graders as a basis for comparison for this component. These data clearly indicate this cohort began the ninth grade well below the grade level norm of 214 wpm. The average number of level gains was just over 5 with the median level of gain being 5 and the mode level of gains achieved being 7 (see Figure 2). Clearly most students achieved growth by this measure. There did not appear to be any correlation between Scan Rate and number of sessions or total time on task.

It should be noted that the results of the guided reading data, for students completing less than 100 sessions, were mixed and does not have any positive correlation. For students completing more than 100 sessions, the data show a positive correlation between time on task and positive growth. For students completing more than 125 sessions, the data shows between 3 and 8 levels of gain (see Figure 2). For most students there were significant gains in their GR rates. In fact, except for three students there were positive gains in reading rates for all students.

Table 5

Initial Guided Reading Rate

Average Initial Guided Reading Rate	162.8855 wpm
Initial Guided Reading Rate Median	166.5 wpm
Initial Guided Reading Rate Mode	186 wpm
Initial Guided Reading Rate Min/Max	77/252 wpm

Table 6

Current Guided Reading Rate

Average Current Guided Reading Rate	283.0542 wpm
Current Guided Reading Rate Median	300 wpm
Current Guided Reading Rate Mode	312 wpm
Current Guided Reading Rate Min/Max	80/646 wpm

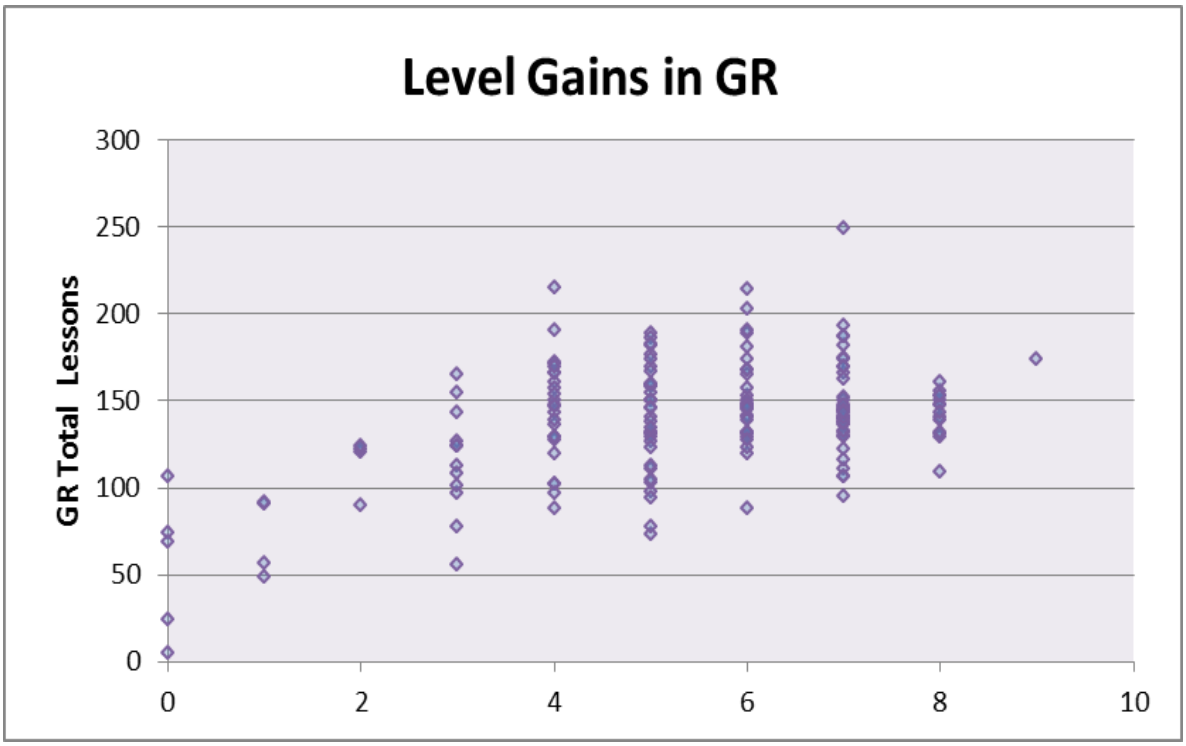


Figure 2. Level gains in guided reading.

By the end of the pilot, 76 students (56%) had achieved at least the ninth-grade reading level (see Figure 3).

When examining the GR data it is apparent that most students' I-Rates were lower than their G-Rates indicating that when students controlled the wpm rate they did not read as fast compared to when the program controlled the rate based upon their acquired skill level. It was unclear what factor caused this difference. It could be due to a lack of motivation or confidence on the students' part or possibly the teacher did not adequately monitor the students' engagement for optimum results. There were no level gains for 6 of the students whereas the most students in any one level of gain was at level 7 with only 1 student achieving at level 9 (see Figure 4). The data indicated that the most significant gains occurred from the third through the seventh levels, representing a near perfect bell curve.

Although all students showed level gains, when comparing demographic data, female students overall showed the most growth, particularly Hispanic females at 6.4 while white males gained the least at 4.6 (see Figure 5) .

Another way of looking at the gains achieved between the initial assessment and the end of the program is through the average Guided Reading gains in words per minute (see Figure 6 and Figure 7).

The average ninth-grade reading rate is 214 words per minute and 224 words per minute for tenth-grade students (Taylor, 1965). In reviewing Figure 6, it is apparent that the graph is skewed left showing consistent gains, between 100 and 200 lessons and the average 120.1687 wpm with a minimum gain of -24 and a maximum of 527 words per minute. In the Guided Reading rates, black males made by far the largest gains, followed by Hispanic females whereas Hispanic males gained the least. In some cases, students actually fell in the words per minute

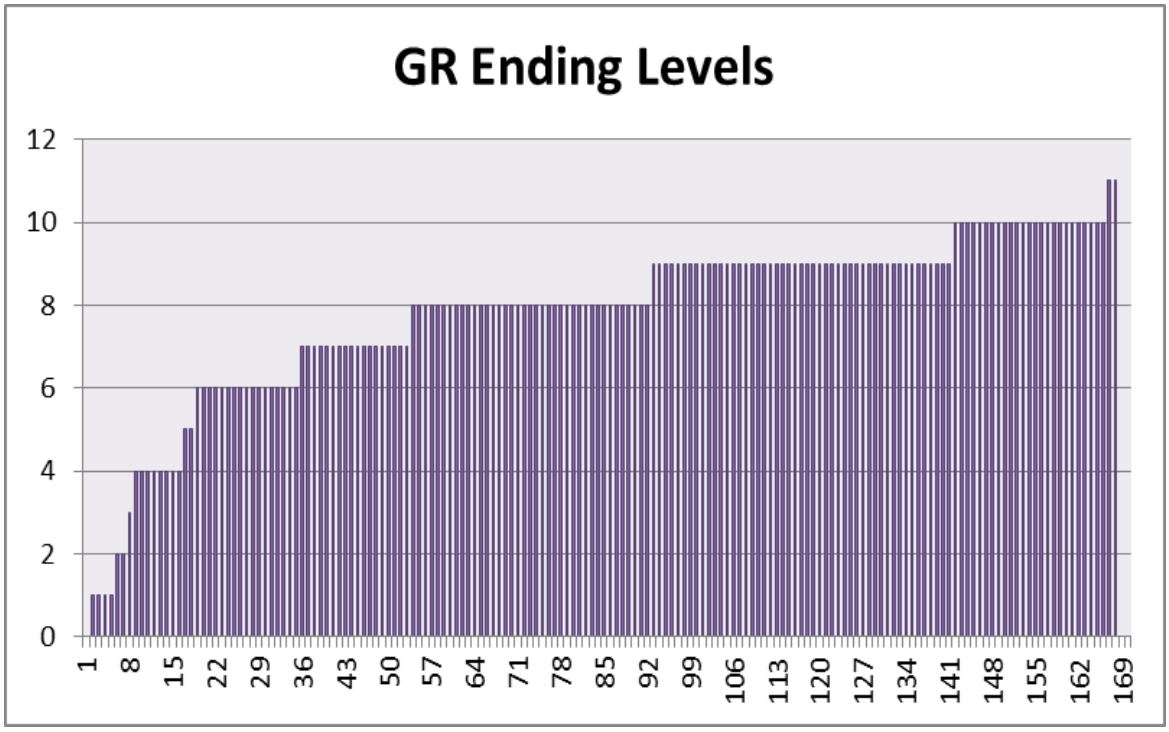


Figure 3. Guided reading year end levels.

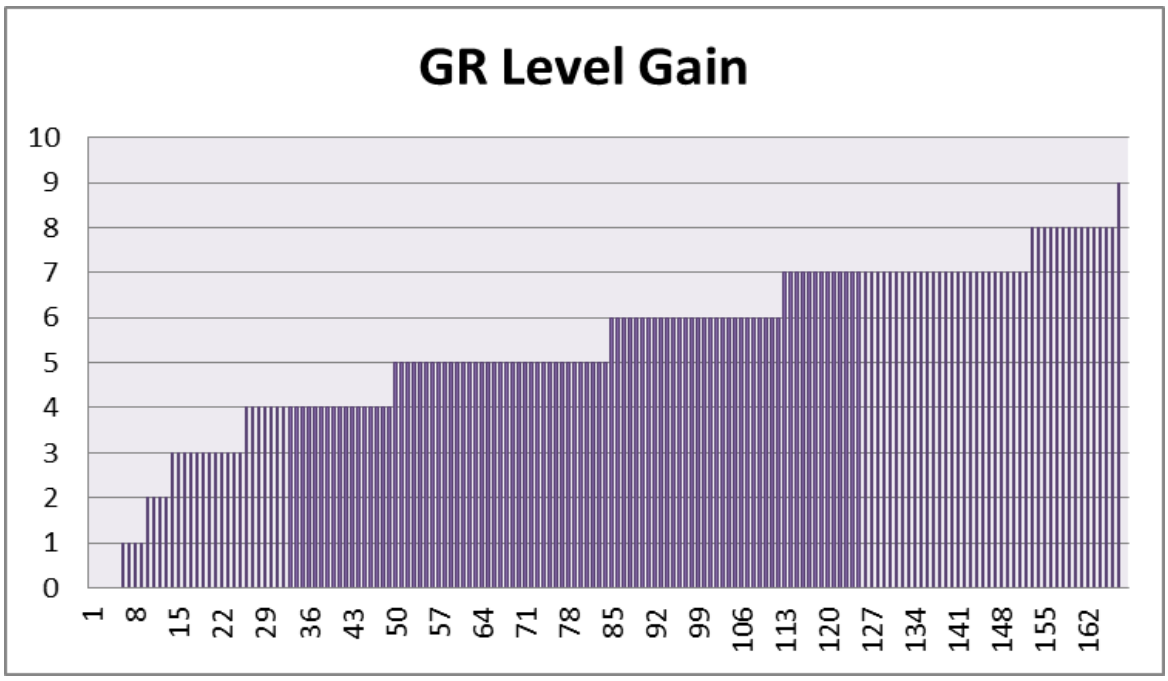


Figure 4. Guided reading level gains.

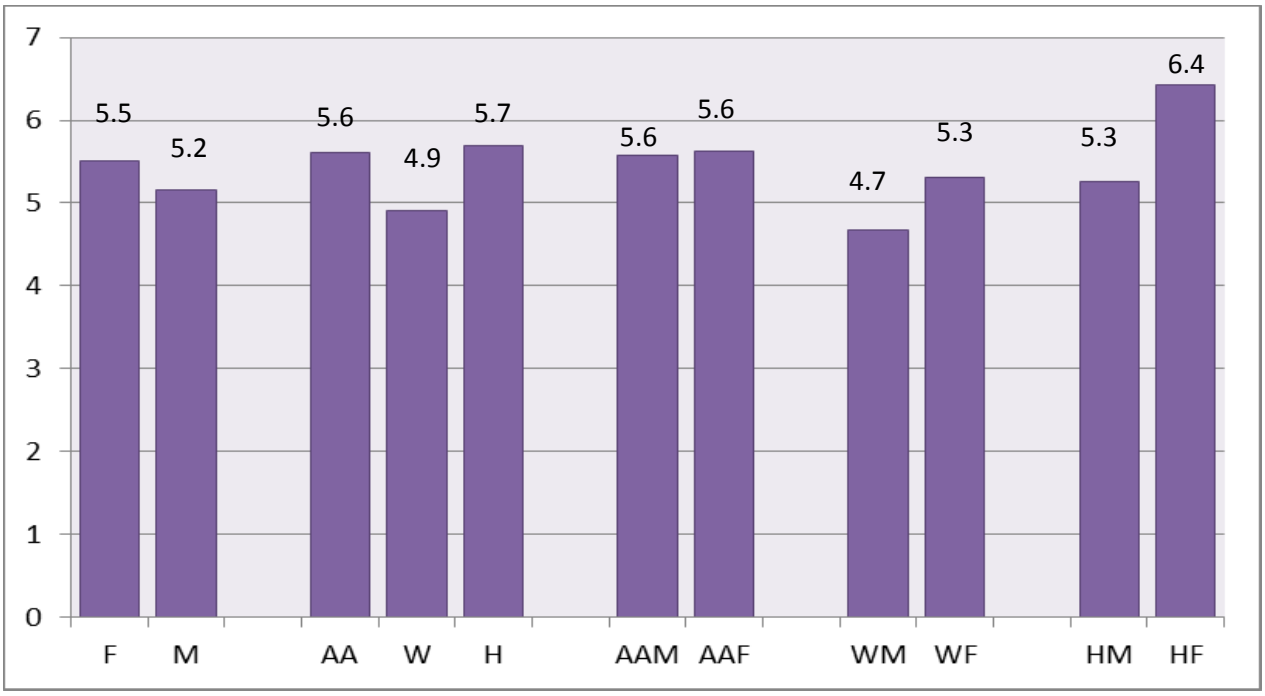


Figure 5. Average level gains.

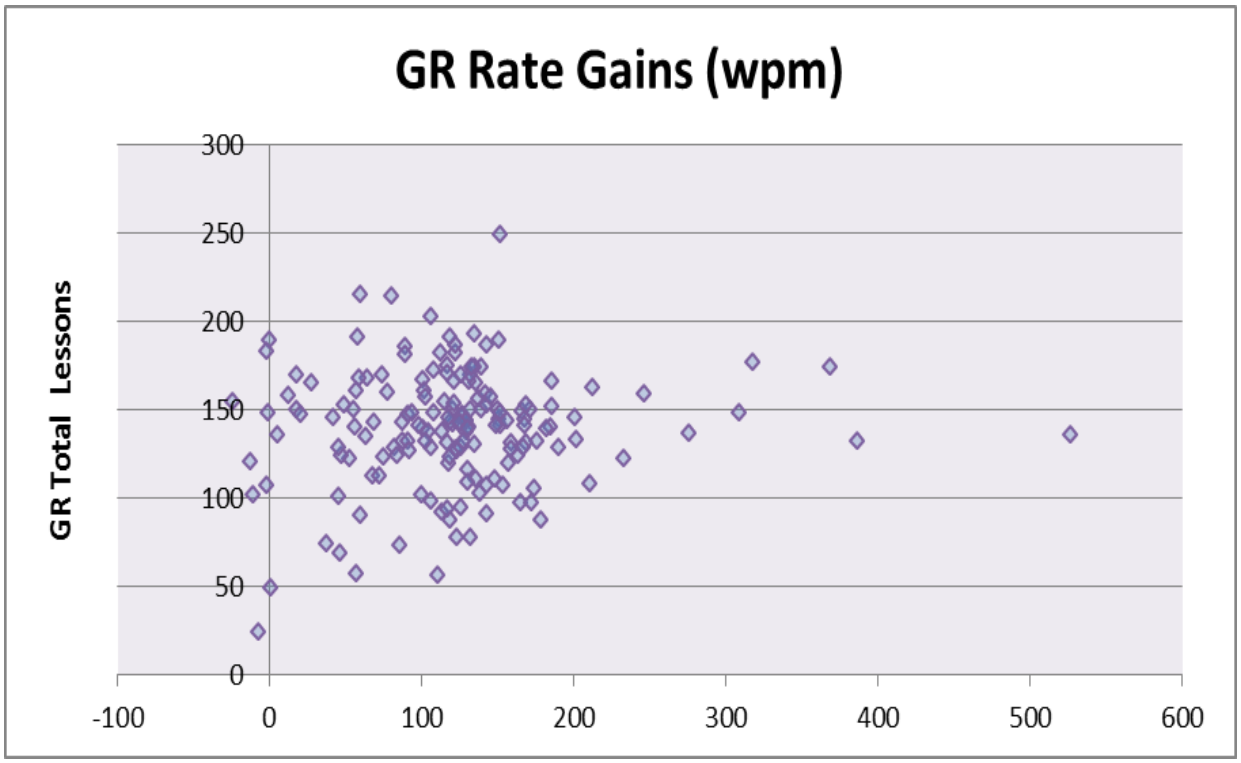


Figure 6. Guided reading rate gains (wpm).

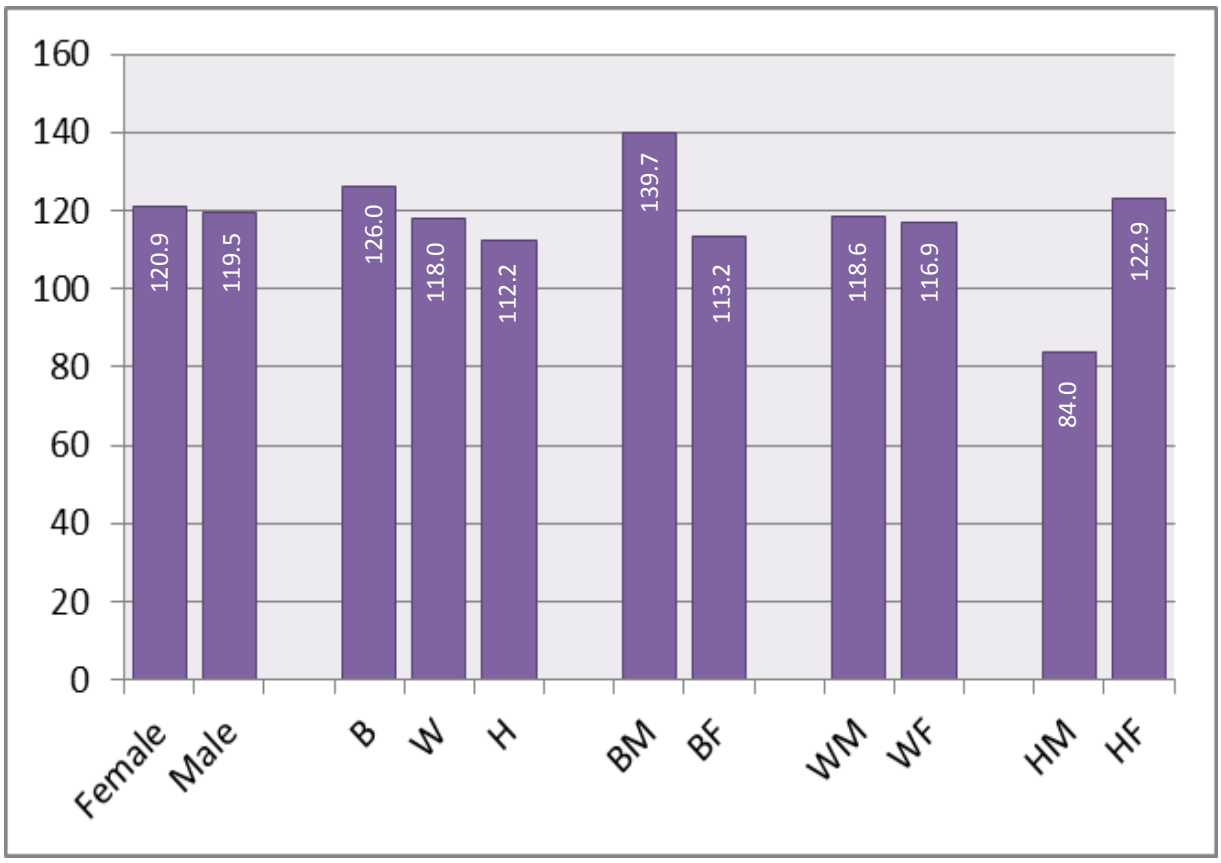


Figure 7. Average rate gains (wpm) by demographic characteristics.

category but none of these were posted by Hispanic males even though they made the least progress overall.

CLOZE Tests

Cloze refers to 'reading closure' where students must fill in the blanks of text using context clues. One of the components of the Reading Plus program is the Cloze Plus vocabulary activity that encompasses social studies and science into the readings. Examination of this year-end student achievement data provides insight into the reading comprehension and vocabulary skills growth (see Figure 8).

There are only eight levels in the Cloze Plus program, each with 20 lessons to improve predictive and inferential comprehension. Sixty-one students (36%) scored at the highest level. The Cloze Level Gains appeared modest, both in number of students and in the number of levels gained (see Figure9). From the scatter plot diagram, there does not appear to be any correlation between the number of sessions and the size of the gains in the Cloze level activities (see Figure 9).

According to the Cloze level data, students had greater difficulty in vocabulary in the areas of social studies and science than in other areas, as measured by the other components included in the *Reading Plus* program. Cloze level gains appear to be more modest, both in the number of students and in number of levels than gains in the Guided Reading level, showing that 83 students (49%) gained more than one level.

In comparing demographics, black females surpassed other females, and black students overall had the most gains in vocabulary. Males, in general, showed more growth over females, while white females demonstrated the least gain. Hispanic males gained slightly over Hispanic females but males across all subgroups made similar gains (see Figure 10).

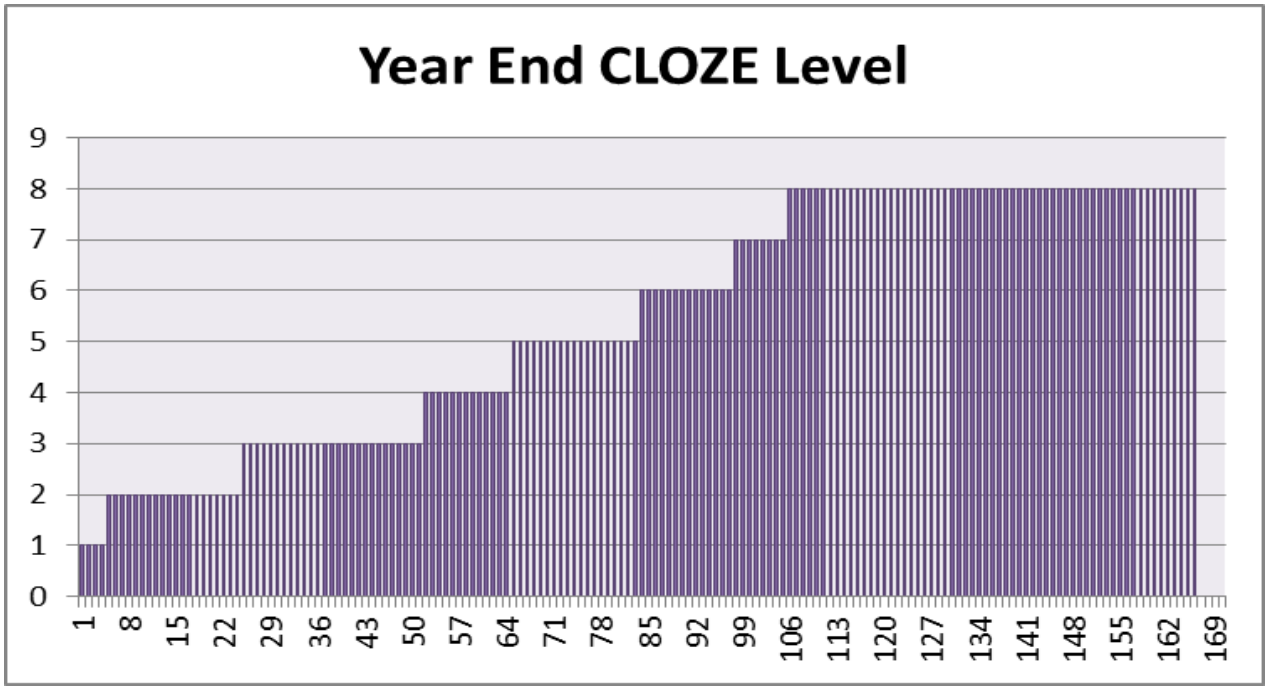


Figure 8. Year end CLOZE level.

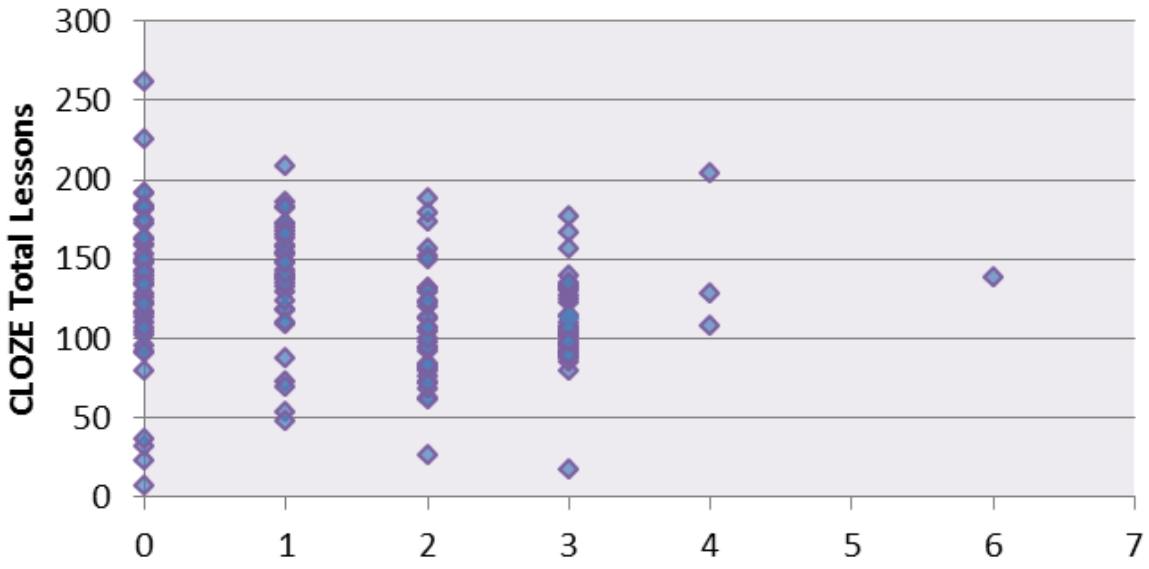


Figure 9. CLOZE level gains.

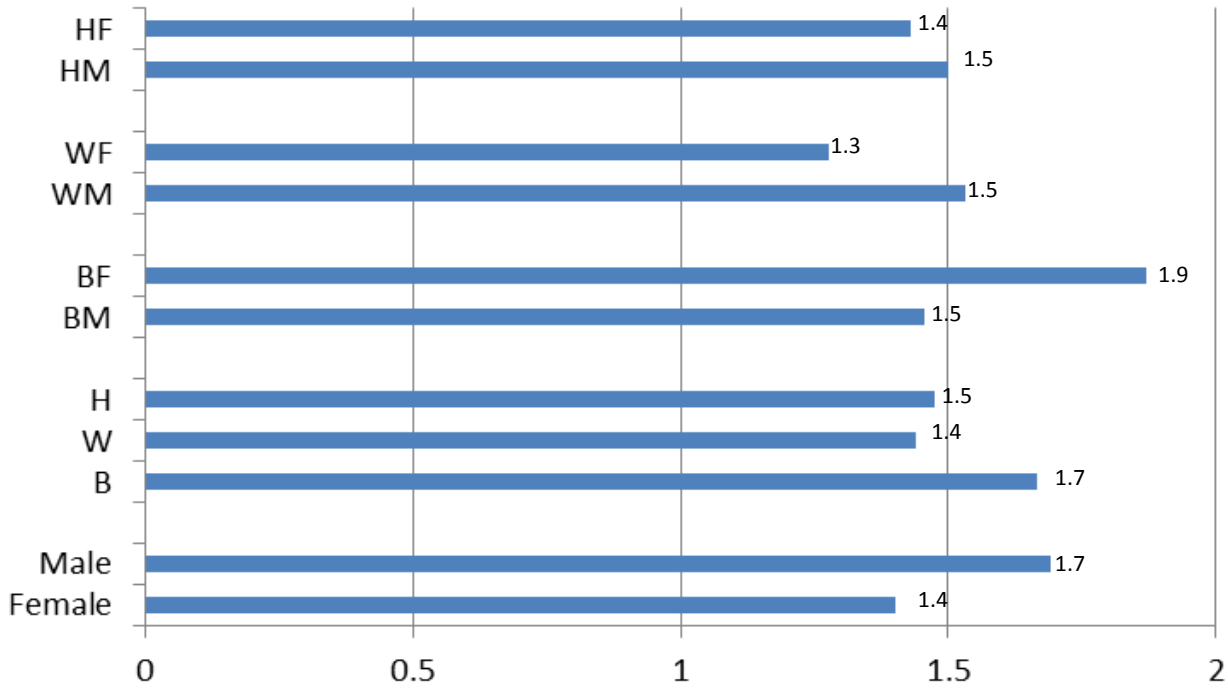


Figure 10. Average CLOZE rate gains.

RAW Data

Reading Around Words (RAW) is a vocabulary portion of the program where students build vocabulary within the context of reading passages, using context clues to determine the meanings of unfamiliar words. Upon examination of the RAW level gains, a positive correlation exists between the number of sessions and the levels of gain (see Figure 11). The data reflects that students demonstrating a level 9 or below in vocabulary comprehension and completing 10 or fewer sessions achieved no growth whereas students demonstrating levels 5, 6, or 7 and completing between 27 to 50 sessions grew 2 levels. Students ending at level 7 and completing between 54 and 90 sessions grew 3 levels. Students that increased between 4 and 8 levels and reached between the 8th and 12th levels (75%), completed between 50 and 137 lessons (see Figure 11). The complexity of vocabulary at the high school level (levels 9 or above) is such that it negatively impacts students' ability to read and comprehend content vocabulary (see Figure 10).

Demographic data incorporated with performance data indicated females slightly outperformed males; however, the greatest degree of difference was with Hispanic males making only 3.75 levels of gains. The other sub-groups were fairly consistent making over 4 levels of gain (see Figure 12).

Lexile Scores

The Lexile Framework for Reading is an educational tool that uses a measure called a Lexile to match readers with books, articles and other leveled reading resources. Readers and books are assigned a score on the Lexile scale, in which lower scores reflect easier readability for books and lower reading ability for readers. Lexile scores are used as a benchmark indicating

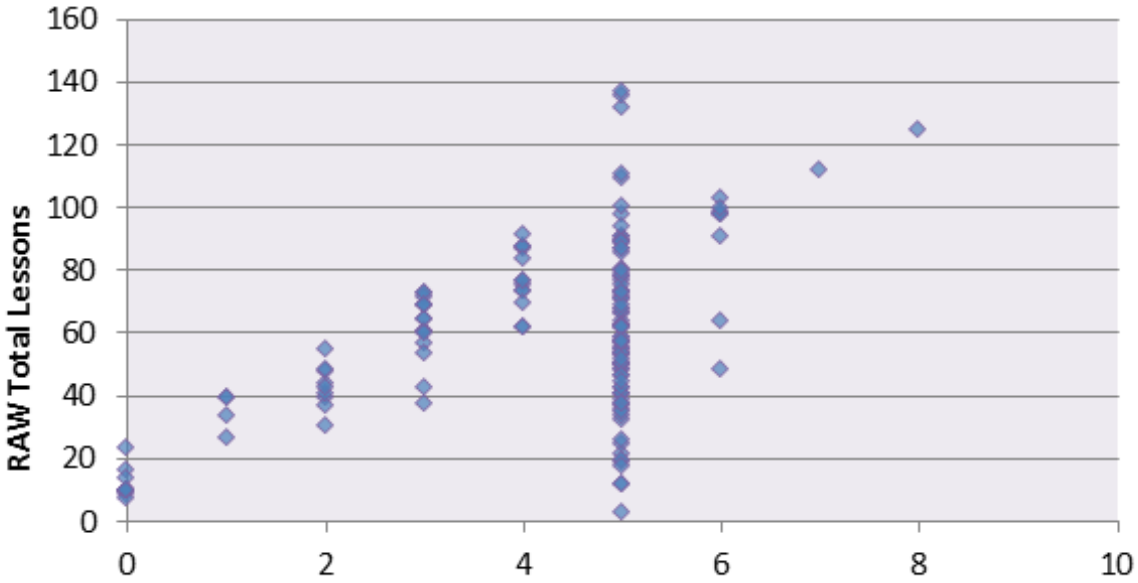


Figure 11. RAW level gains.

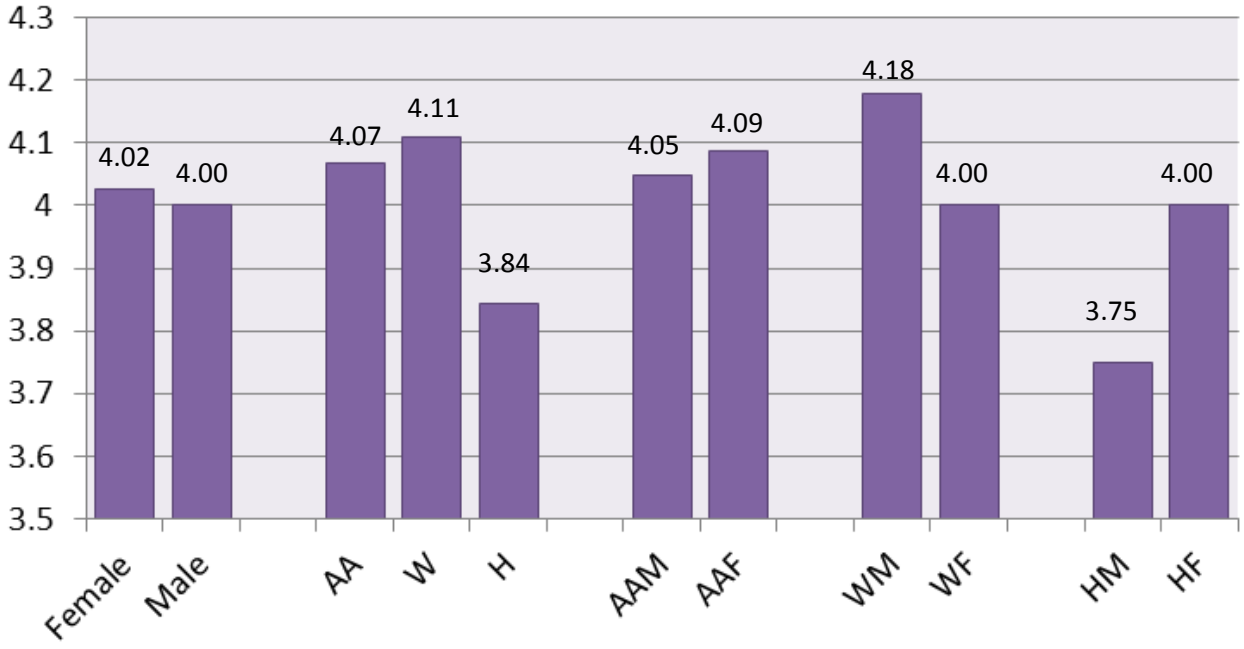


Figure 12. Average RAW level gains by gender and ethnicity.

where students began this pilot, whether at grade level, above or below grade level and also providing a measurement of achievement (see Table 7).

Upon entering 9th grade, students were evaluated based on his/her eighth-grade Lexile data, derived from their converted North Carolina End-of-Grade exam scores, and growth shown in their ninth-grade Lexile data from their converted English 1 North Carolina End-of Course scores. Data were collected from a total of 56 students that had both sets of Lexile scores. Lexile gain was obtained by subtracting the eighth-grade Lexile score from the ninth-grade Lexile score.

The average Lexile score at the completion of the pilot was 1094 which is 14 points above the expected average ninth grade score as reported by Lexile (see Figure 13 and Table 7). The achievement data represents an overall average gain of over 101 points with females averaging a 97-point increase and males averaging 105-point increase. The Lexile scores also revealed that black males, and black students overall, achieved the most growth followed closely by Hispanic females; while Hispanic males showed the least amount of growth (see Figure 14).

The range of achievement in Lexile scores went from a negative 350 points of growth to a positive 360 points of growth (see Figure 15). A preferable range of achievement in Lexile scores is from 100L below to 50L above the student's Lexile measure. When a student engages in reading material above his or her Lexile range, the teacher then can consider what additional instruction or lower-level reading resources might help this student. The demonstrated negative growth data are outliers that reflect any number of external factors unrelated to the Reading Plus program activities and assessments.

Table 7

Typical Reader 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

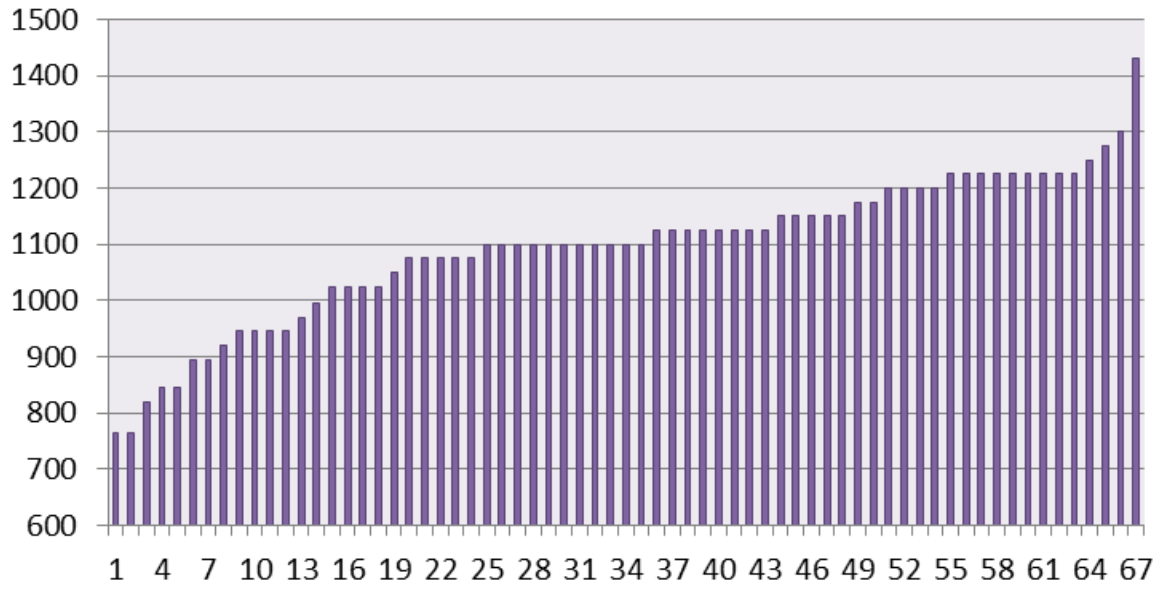


Figure 13. English 1 exam Lexile data.

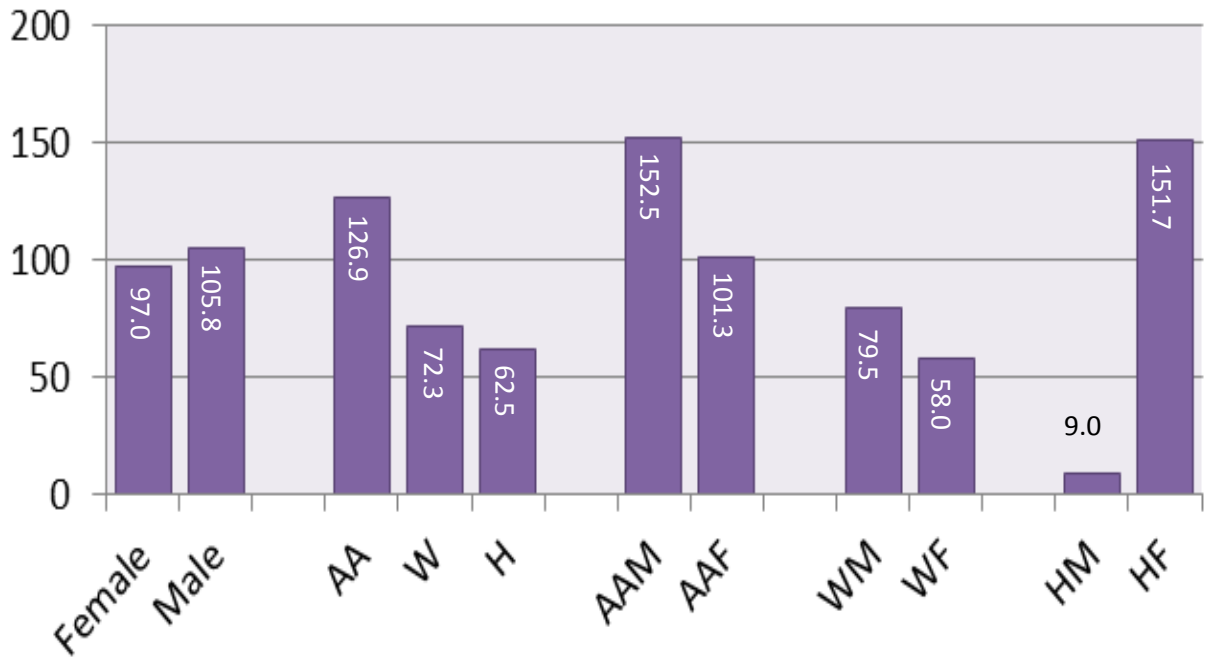


Figure 14. Average Lexile gains by gender and ethnicity.

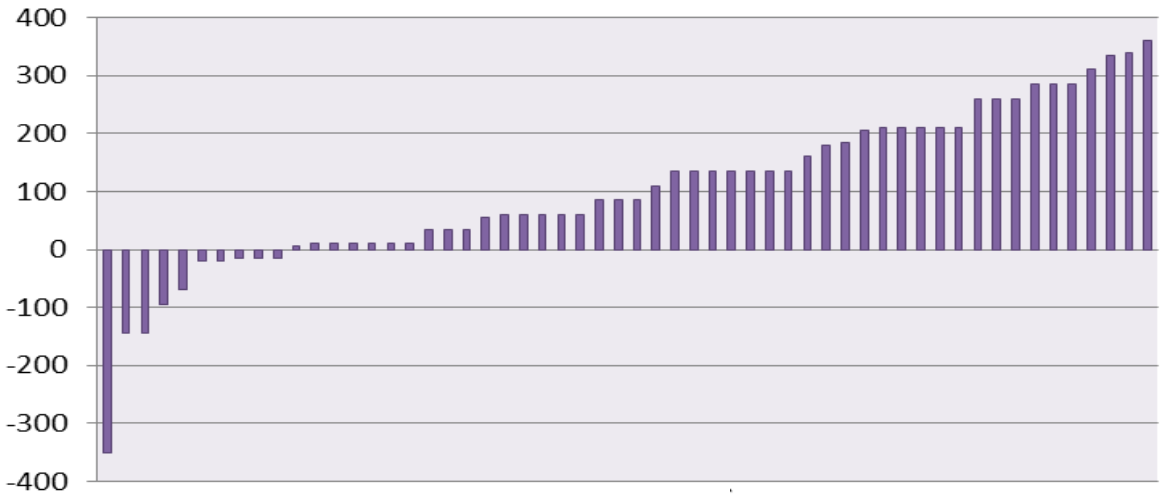


Figure 15. Lexile gains.

Teacher Participation Survey

The Teacher Participation Survey is a series of questions that asked the teachers who implemented the *Reading Plus* pilot the impact it had on their students. This survey was intended to collect qualitative data from the teacher participants to determine trends within this program review. The questions on the survey inquired about teacher training, support and program implementation as well as students' reading skills achievement. The specific students' reading skills data that the survey collected included:

(a) Comprehension

(b) Fluency

(c) Vocabulary

(d) Phonemic awareness

(e) Phonics

(f) Reading stamina

(g) Positive nonverbal behaviors

(h) Negative nonverbal behaviors

Motivation strategies and grade levels of students were also collected. The survey consisted of questions using a Likert scale, commonly used in research involving questionnaires, implementing five ratings as well as some open response components to the questions (see Appendix D).

The first question asked about the adequacy of the training and support that the teachers received in implementing the *Reading Plus* program. Nine of the ten reported that they received better than adequate training and support in implementing the program. The next question asked specifically how much fidelity was given to the implementation of the program within the

guidelines of the *Reading Plus* program guide and 100% of the teachers reported doing an above average job in this regards. Two questions, one on the Likert scale and the other an open response, asked about the degree of impact on student comprehension skills and 87.5% (7 of 8 respondents) reported above average gains. Responses from the open-ended component included that students who were present most of the time and stayed on task showed the most improvement. Teachers also reported that students were more motivated to read and to achieve more because they were allowed to choose topics they wanted to read about.

The survey also asked both a scaled response and an open-ended question regarding the program's impact on student fluency skills and here 75% (6 out of 8 respondents) of the teachers responding reported above average gains. All of the teachers in the open response reported that the program increased fluency for students through repetitive practice involving independent and guided reading exercises. Another area questioned the impact on students' vocabulary skills and overall 75% (6 of 8 respondents) of teachers reported an above average increase in vocabulary skills. Further, teachers agreed that students increased their vocabulary skills through the regular practice of using challenging vocabulary words in their required readings.

The teacher responses regarding the phonemic awareness questions were mixed with many indicating that their understanding or comfort with this component of the program was less than in other components. Overall 75% (6 of 8 respondents) of teachers reported at or below average improvement in the area of phonemic awareness. The results of the phonics questions were also similarly inconsistent at 75% (6 of 8) while other areas showed above average growth. The teacher open response comments generally implied that students achieved little growth or that not much time was spent in this module because it was not seen as a high need area.

In regards to reading stamina, five teachers reported above average improvement and three teachers reported significant improvement. The open teacher response comments were all very positive stating that by the end of the pilot students could read longer passages as well as more complex passages in less time with greater comprehension. The questions regarding positive and negative nonverbal behaviors were entirely open response and in this area teachers remarked that excitement and confidence could be seen in the students' faces, behaviors and also in their requests to work on the program outside of class time. The students became competitive to "level up" in the program. Their focus and attention spans increased gradually over time. Negative non-verbal responses were negligible as teachers really did not observe negative types of behaviors although some had difficulty staying focused. Motivation strategies were also implemented and teachers were surveyed on the types of motivation interventions that were used. Strategies included extrinsic rewards of award certificates, free time on the computers, and candy. The intent was for the extrinsic rewards to turn into intrinsic rewards as the students became more motivated to read.

Cost Analysis

Reading Plus purchase pricing is based upon a one-time license for Concurrent Use Seats (CCU) and a yearly web access fee, for a three year period. Concurrent Use Seats represent the total number of students who are logged onto the program at any given time. For example: if the school has one computer lab with 25 computers and these computers will be used to access Reading Plus four periods a day by 25 students each period, then the program is being used to remediate 100 students, but only 25 students may be logged in at any given time. By utilizing the program by 100 students over the course of the day, it lowers the cost per student. The web

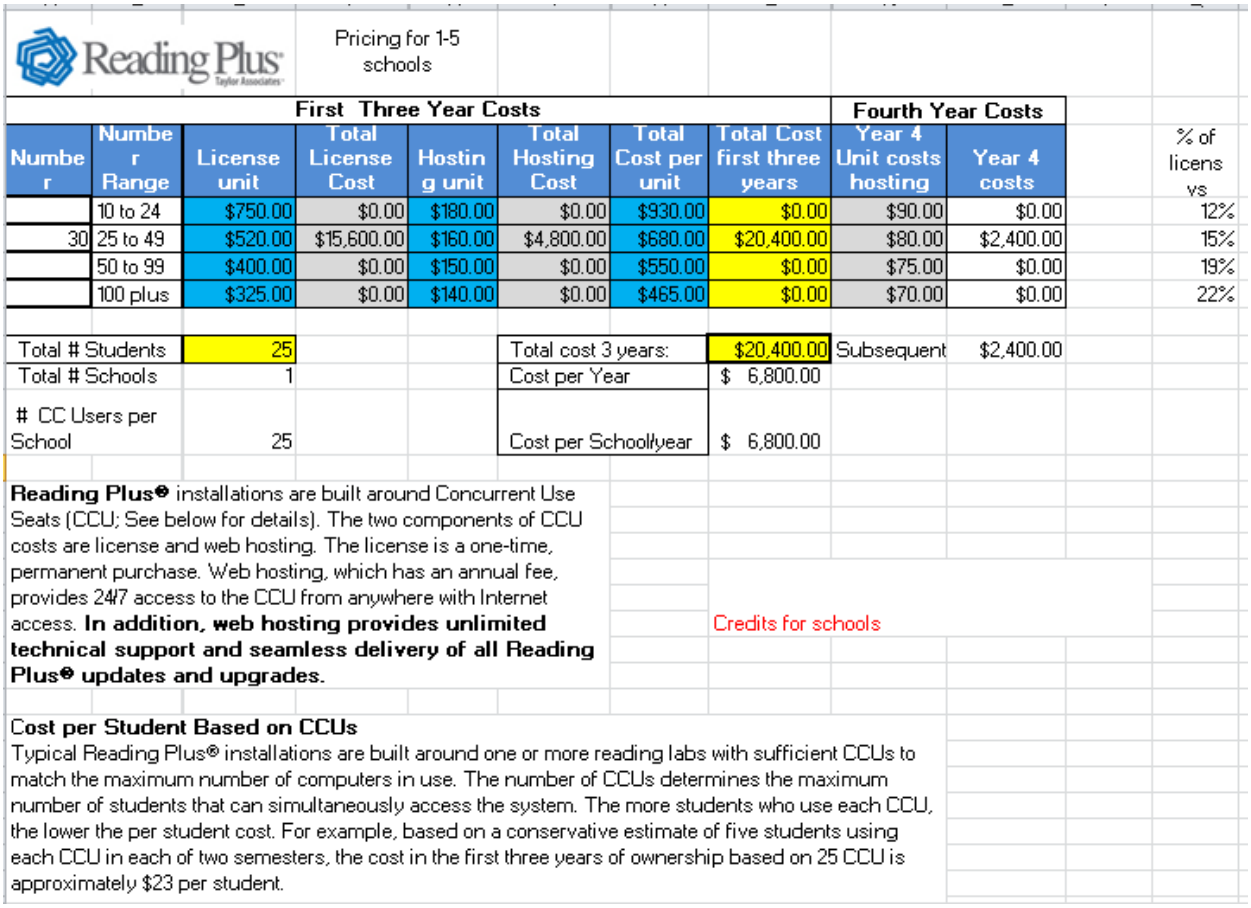
access fee, for 25 students, is $4,800.00 over three years. The site license fee, over three years, is $15,600. The total cost combined, over three years, is $20,400 or $6800 per year. The over all cost per student for one year is $68 or $23 per student over three years (see Figure 16)

Two other programs used in neighboring schools in Moore County are *Scholastic's Read 180* and *Fast Forward® to Reading*. Both of these programs are very similar to Reading Plus but *Scholastic's Read 180* costs $589.95 per seat ("Read 180/System 44 proposal," 2013) and *Fast Forward® to Reading*, is $500.00 per seat. Additionally, What Works Clearinghouse (2010) states that a single license for *Fast Forward® to Reading* is $500.00 with no quantity discount. Therefore, if these programs were implemented for 100 students used in this pilot, the total cost would be $50,000 (Fast Forward) and $58,995 (Read 180), respectively.

Recommendations

Reading Plus is an extremely valuable tool but there were some areas that stood out in this program evaluation that need administrative action. The data showed an over-representative number of males that participated in the pilot (55%), particularly African American males, which was 31%, in comparison to this population in the rest of the school which was 22%. There were also variations in the growth and rate of growth based upon gender and subgroups. These students must be identified earlier and reading intervention strategies need be put into place that are sensitive to gender, culture or ethnicity to be most effective. Motivation and rewards also need to be put into place that vary based on these factors to be most effective when remediating reading skills.

Another area that needs administrative action is the amount of time spent on task with phonemic awareness and phonics based upon the results of the teacher participation survey. Teachers must follow the program with fidelity to ensure that students are not only completing



Reading Plus

Pricing for 1-5 schools

		First Three Year Costs						Fourth Year Costs		
Number	Number Range	License unit	Total License Cost	Hosting unit	Total Hosting Cost	Total Cost per unit	Total Cost first three years	Year 4 Unit costs hosting	Year 4 costs	% of licens vs
	10 to 24	$750.00	$0.00	$180.00	$0.00	$930.00	$0.00	$90.00	$0.00	12%
30	25 to 49	$520.00	$15,600.00	$160.00	$4,800.00	$680.00	$20,400.00	$80.00	$2,400.00	15%
	50 to 99	$400.00	$0.00	$150.00	$0.00	$550.00	$0.00	$75.00	$0.00	19%
	100 plus	$325.00	$0.00	$140.00	$0.00	$465.00	$0.00	$70.00	$0.00	22%

Total # Students	25	Total cost 3 years:	$20,400.00	Subsequent	$2,400.00
Total # Schools	1	Cost per Year	$ 6,800.00		
# CC Users per School	25	Cost per School/year	$ 6,800.00		

Reading Plus® installations are built around Concurrent Use Seats (CCU; See below for details). The two components of CCU costs are license and web hosting. The license is a one-time, permanent purchase. Web hosting, which has an annual fee, provides 24/7 access to the CCU from anywhere with Internet access. **In addition, web hosting provides unlimited technical support and seamless delivery of all Reading Plus® updates and upgrades.**

Credits for schools

Cost per Student Based on CCUs

Typical Reading Plus® installations are built around one or more reading labs with sufficient CCUs to match the maximum number of computers in use. The number of CCUs determines the maximum number of students that can simultaneously access the system. The more students who use each CCU, the lower the per student cost. For example, based on a conservative estimate of five students using each CCU in each of two semesters, the cost in the first three years of ownership based on 25 CCU is approximately $23 per student.

Figure 16. Reading Plus pricing.

the activities but also spending sufficient time on task with each. Teachers must receive adequate training and support to monitor and assist students in all of the components.

Conclusion

Reading improvement for students was shown in all areas of the Reading Plus program. Scan and Flash rates both showed student improvement in scanning rates, visual coordination and directional attack, as well as visual discrimination and instant recognition. Flash activities further improved visual-perception skills such as visual discrimination and visual sequential memory. Guided Reading activities markedly improved student silent reading and comprehension rates while Cloze and RAW activities increased vocabulary by unlocking the meanings of unfamiliar words, especially in the areas of social studies and science. Lexile, though not a part of the Reading Plus program, is used to measure reading levels and in this area students demonstrated growth above expected Lexile levels for ninth-grade readers.

The Reading Plus program addressed each of the five key areas deemed critical to literacy by the U.S. Department of Education. The Reading Plus program increased the degree of phonemic awareness, phonics, fluency, reading stamina, comprehension, character recognition and recall, vocabulary acquisition skills, and Lexile levels of the students sampled in this program. By the end of the pilot, 76 students (56%) had achieved at least the 9th grade reading level.

In the teacher participation survey, 90% of teachers (9 out of 10) reported they received above adequate training and support to implement Reading Plus with fidelity. However, when teachers responded to the phonics and phonemic awareness questions, it was reported that they did not feel comfortable with those components and as a result the students did not spend adequate time on task in these two areas. Therefore these areas may not have been implemented

with fidelity. However, students showed growth in all areas and teachers were overwhelmingly pleased with the Reading Plus program. Reading Plus improved students' reading abilities, which, in turn, impacted Lexile scores. Students enrolled in English I and concurrently participated in the RP pilot demonstrated an average Lexile score of 1094, 14 points above the expected average ninth grade score as reported by Lexile. This data represents an average gain of over 101 points with females averaging a 97 point increase and males averaging 105 point increase.

Reading Plus is a valuable asset to Pinecrest High School and Moore County Schools. The Cost Analysis showed that the Reading Plus program, at $23 per seat over three years or $68 per seat for a single year, was a more cost effective solution than similar reading programs. It also satisfies the USDE guidelines for the best instructional methods to teach reading as well, using technology as a motivation to reach high school students.

Further, the results of the Reading Plus program were so impressive that the program is currently being implemented at Riverside High School in Durham, North Carolina. Riverside High School has undergone a significant cultural and socioeconomic change in recent years and in the era of high stakes testing, justification for implementing a reading program with proven results was self-evident. Data from this program evaluation was shared with the Area Superintendent and curriculum department of Durham Public Schools and approval was granted to purchase 200 seats for the Reading Plus program. Reading Plus has become a significant strategy in the Response to Intervention (RtI) program, a multi-tiered approach to early identification and support of students with learning and behavior needs, as an intervention to address the reading deficiencies of identified students. These students have begun to achieve similar results as were documented in this program evaluation.

Durham Public Schools has since negotiated a collective district quote for the Reading Plus program lowering the cost per seat, making it a cost effective method for remediating student reading deficiencies. Durham Public Schools is giving consideration to implement this program district wide.

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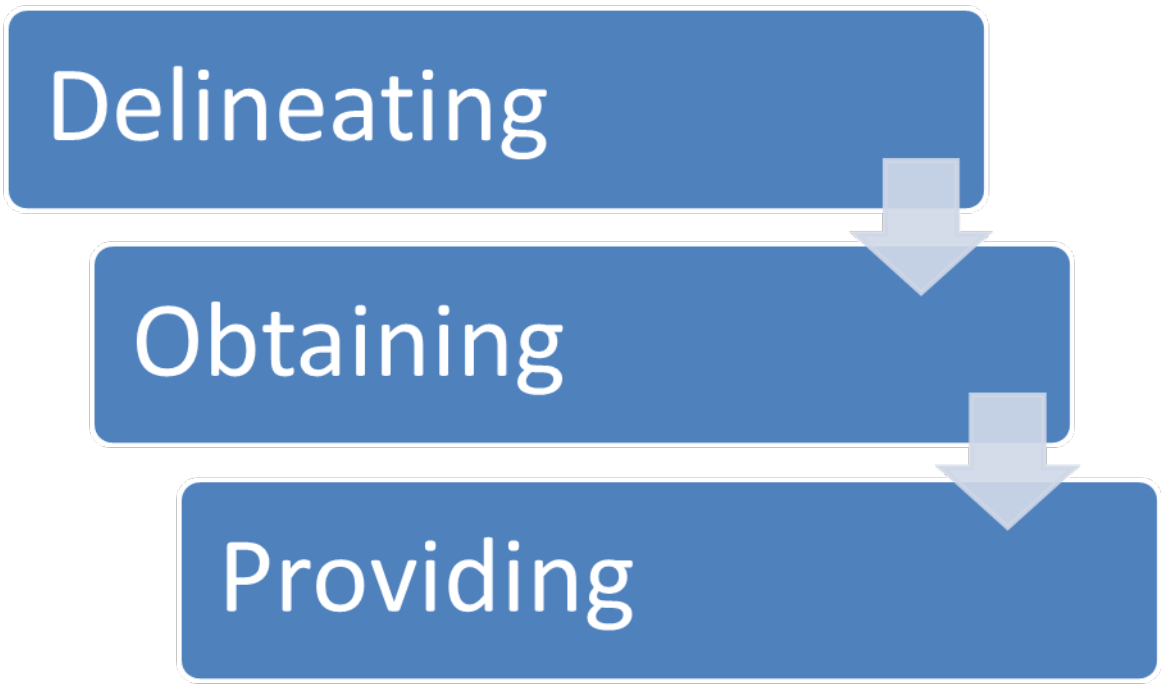
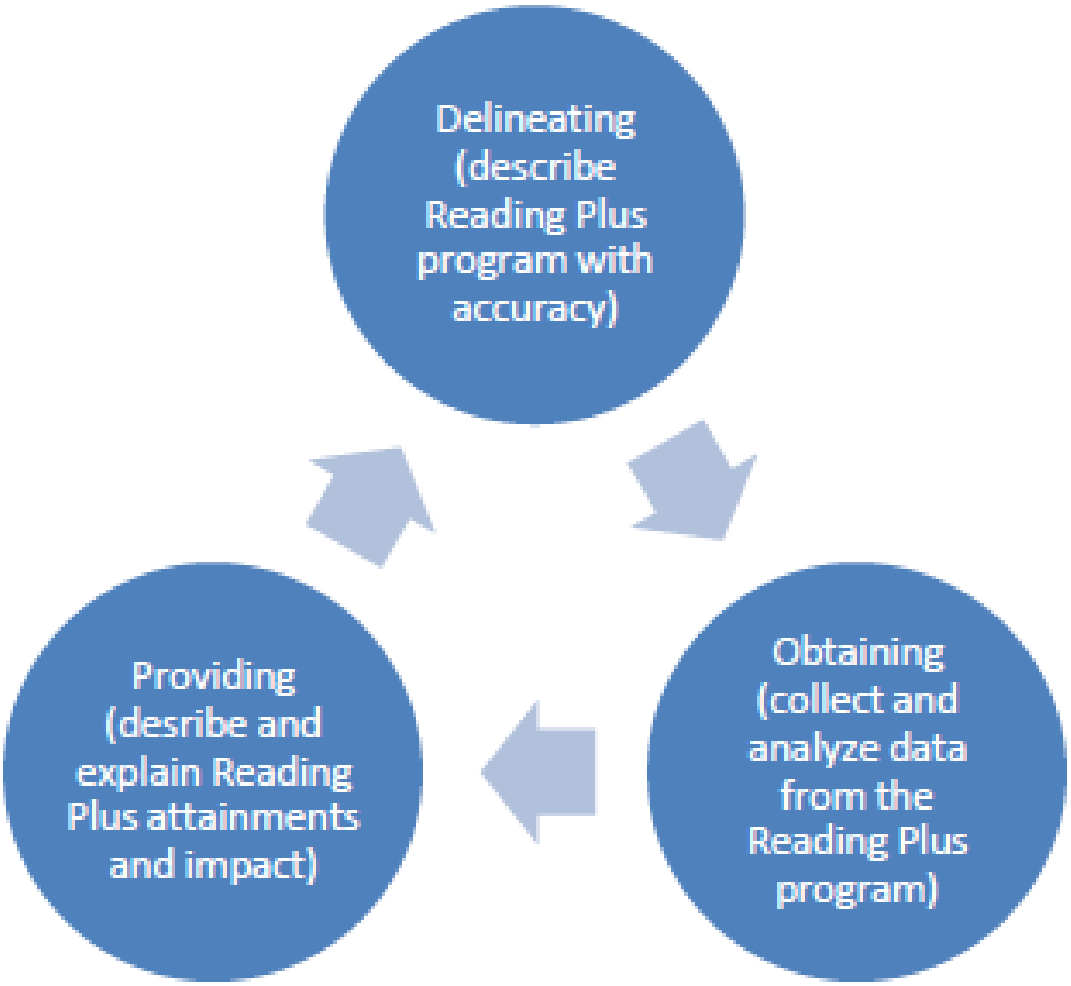
APPENDIX A: CONTEXT-INPUT-PROCESS-PRODUCT (CIPP) DECISION MODEL

APPENDIX B: PROGRAM EVALUATION CYCLE



APPENDIX C: CIPP RELATIONSHIP OF EVALUATION TO DECISION-MAKING



APPENDIX D: TEACHER SURVEY QUESTIONS

Survey: Reading-Plus

* Required

1. Training and Support *

I received adequate training and support on the implementation of the Reading Plus program?

1 2 3 4 5

No training or support ○ ○ ○ ○ ○ Significant training or support

2. Program Implementation *

I implemented the Reading Plus program with fidelity according to the Reading Plus implementation guide?

1 2 3 4 5

Did not implement with fidelity ○ ○ ○ ○ ○ Implemented with fidelity

3. Comprehension Skills (A) *

Based upon my observations, the Reading Plus Intervention Program impacted my students' comprehension skills.

1 2 3 4 5

No impact ○ ○ ○ ○ ○ Significant impact

4. Comprehension Skills (B) *

Based upon your observations, how did the Reading Plus Intervention Program impact your students' comprehension skills?

5. Fluency Skills (A) *

Based upon my observations, the Reading Plus Intervention Program impacted my students' fluency skills?

1 2 3 4 5

No impact ○ ○ ○ ○ ○ Significant impact

6. Fluency Skills (B) *

Based upon your observations, how did the Reading Plus Intervention Program impact your students' fluency skills?

7. Vocabulary Skills (A) *

Based upon my observations, the Reading Plus Intervention Program impacted my students' vocabulary skills?

	1	2	3	4	5	
No impact	○	○	○	○	○	Significant impact

8. Vocabulary Skills (B) *

Based upon your observations, how did the Reading Plus Intervention Program impact your students' vocabulary skills?

9. Phonemic Awareness Skills (A) *

Based upon your observations, did the Reading Plus Intervention Program impact the students' phonemic awareness skills?

	1	2	3	4	5	
No impact	○	○	○	○	○	Significant impact

10. Phonemic Awareness Skills (B) *

Based upon your observations, how did the Reading Plus Intervention Program impact the students' phonemic awareness skills?

11. Phonics Skills (A) *

Based upon my observations, the Reading Plus Intervention Program impacted my students' phonics skills?

	1	2	3	4	5	
No impact	○	○	○	○	○	Significant impact

12. Phonics Skills (B) *

Based upon your observations, how did the Reading Plus Intervention Program impact your students' phonics skills?

13. Reading Stamina (A) *

Based upon my observations, the Reading Plus Intervention Program impacted my students' reading stamina?

	1	2	3	4	5	
No impact	○	○	○	○	○	Significant impact

14. Reading Stamina (B) *

Based upon your observations, how did the Reading Plus Intervention Program impact your students' reading stamina?

15. Non-Verbal Behavior *

List any positive or negative non-verbal behaviors that you observed in students as they used the Reading Plus program.

16. Motivation Strategies *

List any motivation strategies did you use with students participating in Reading Plus?

Submit

Never submit passwords through Google Forms.

APPENDIX E: 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 F: EXECUTIVE SUMMARY

Moore County Superintendent, Dr. Aaron Spence, directed schools to provide data to show the effectiveness of their selected reading intervention programs. This evaluation 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.

After a year-long pilot utilizing Reading Plus it was determined that the program works. Reading improvement was shown in all areas. Guided Reading activities markedly improved silent reading and comprehension rates while also increasing vocabulary by unlocking the meanings of unfamiliar words. The Reading Plus program addresses each of the five key areas that the U.S. Department of Education deems critical for proficient readers. It increases the degree of phonemic awareness, phonics, fluency, reading stamina, comprehension, character recognition and recall, and vocabulary acquisition skills. By the end of the pilot, 76 students, or 56%, had achieved at least the 9th grade reading level.

Further, teachers reported growth in all areas and were overwhelmingly pleased with the Reading Plus program. Reading growth was measured using Lexile scores and students demonstrated above average Lexile levels in this area after utilizing Reading Plus. Students demonstrated an average Lexile score of 1094, 14 points above the expected average ninth grade score as reported by Lexile. This data represents an average gain of over 101 points with females averaging a 97 point increase and males averaging 105 point increase.

Lastly, a cost analysis showed that the Reading Plus program, at $23 per seat over three years or $68 per seat for a single year, was a more cost effective solution than similar reading programs.

APPENDIX G: IRB APPROVAL LETTER

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: Joel County

CC: Jim McDowelle

Date: 7/9/2014

Re: UMCIRB 14-000489
PROGRAM EVALUATION OF READING PLUS: A STUDY OF THE IMPACT ON READING ACHIEVEMENT FOR HIGH SCHOOL STUDENTS IN MOORE COUNTY SCHOOLS

I am pleased to inform you that your research submission has been certified as exempt on 7/9/2014 . 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.