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The Influence of Participation in the Leveled Literacy Intervention Program on the Sustained Literacy Achievement for Students in Grades One Through ThreeV

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THE INFLUENCE OF PARTICIPATION IN THE LEVELED LITERACY INTERVENTION
PROGRAM ON THE SUSTAINED LITERACY
ACHIEVEMENT FOR STUDENTS IN GRADES ONE THROUGH THREE

By
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Submitted in fulfillment of the requirements for the degree
Doctor of Education
Department of Education, Management, Leadership and Policy
Seton Hall University
December 2017

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APPROVAL FOR SUCCESSFUL DEFENSE

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ABSTRACT

This study evaluated the efficacy of Fountas & Pinnell's Leveled Literacy Intervention (LLI) program and its effect on struggling readers in the first grade, as well as the sustaining effects of the intervention over a two-year period. The students in the study attended an elementary school in a Central New Jersey public school district and received the LLI supplemental pull out reading program five days a week for 30 to 45 minutes per session as prescribed.

The study hypothesized that the LLI program would have a significant effect on the reading progress of struggling first-grade students in the districts' first year of implementation and that the achieved proficiency levels would be maintained through the end of their third-grade year.

A causal-comparative design was used with data that were previously collected from a grade one cohort in the district studied. Students in the control group were matched with students in the treatment group according to gender, socioeconomic status, ethnicity, and special education classification. The findings confirmed that no statistically significant differences were found between the groups for the Developmental Reading Assessment in Grade 1 or the Partnership for Assessment of Readiness for College and Careers in Language Arts in Grade 3.

Based on the analysis, the findings suggest that LLI should be continued and that future implementation should include the use of a common district data protocol to track student progress and attendance. Additionally, the length and duration of sessions should be closely monitored, professional development for teachers should be considered, and close administrative oversight should ensure fidelity to the model.

Procedures for the placement of English language learners should also be established based on language proficiency.

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DEDICATION

I would like to dedicate this to the memory of my mother, Marian Cole. She continues to be my inspiration and a reminder for me to be the best person that I can be. She was my biggest cheerleader and my accomplishments are due in large part to her unconditional love and support throughout all phases of my life. Thank you mom for your encouragement and for instilling in me the belief that I could achieve anything I set my mind to. I know you are smiling in heaven and continue to be my guiding light and guardian angel.

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CHAPTER I

INTRODUCTION

When Corey's first-grade teacher noticed that his literacy skills were below the basic level and were not improving as expected, she grew concerned. She was unsure whether he was receiving support at home but noticed that he was far behind his peers in regard to literacy skills. Corey's instruction was differentiated in the classroom, but he continued to struggle. As various tier-one interventions were implemented, Corey began to show progress; however, so did his peers. They grew in literacy skills as expected for the grade level, while Corey performed far behind grade-level expectations at the end of the year. Corey was very verbal and retained any information presented to him in a variety of forms; however, he continued to struggle with reading and writing. Corey's mother was involved throughout the year and hired a personal tutor to assist him outside of school. Corey was promoted to the second grade and presented the same difficulties, which were also remedied by differentiation in the classroom; however, this year, he received assistance in phonics and decoding strategies from one of the support teachers. By the end of year two, Corey was more confident in his reading abilities, but his writing had not progressed at all, and he remained an at-risk student. He used his communication and comprehension skills to accommodate his literacy deficits, which were far above grade level, to help get him through the year. In the third grade, Corey's mother was so frustrated with his lack of progress that she requested that he be tested by the child study team to determine whether he had a learning disability. It was at this point that I was presented with his case.

Decades of research present findings indicating that if children do not acquire adequate literacy skills in their early years of schooling—in particular by the end of Grade 3—ongoing academic difficulties in school, as well as increased chances of dropping out, are probable (Hernandez, 2011; Juel, 1988). While it is evident that high-quality classroom instruction has a significant impact on student achievement, it is argued that there is also a need for comprehensive scientifically based literacy programs that include the early identification of literacy deficits (Fountas & Pinnell, 2003).

Reading proficiency in the early grades continues to be of concern, particularly for low socioeconomic groups and minorities. According to the 2015 National Assessment of Educational Progress (NAEP) report, 64% of fourth graders were not proficient in reading (NAEP, 2015). In recognition of the importance of early literacy, many states have established policies and practices mandating retention in the third grade if students do not pass the state-standardized reading proficiency assessment. There are currently 18 states in the United States (US) that have third-grade retention laws; these include Connecticut, Maryland, Ohio, and North Carolina. This mandate targeting third-grade reading proficiency is predicated on the findings that the fourth-grade curricula become more complex and that children who do not read at grade level by the end of the third grade are four times more likely to drop out of high school than those who do (Hernandez, 2011).

Policy makers and school administrators continue to search for ways to close the literacy achievement gap. This push for retention, along with the reports of low

socioeconomic and minority students' performance on standardized assessments, have garnered the attention of school and district leaders nationally (Hernandez, 2011).

Background of the Study

Young adults who, through anomalous circumstances, lacked exposure to language as children are not likely to achieve the same level of language proficiency when opportunities for learning are presented following completion of postsecondary school (Aratani, 2009; Ladd, 2012). Historically, low socioeconomic and minority groups have underperformed on standardized assessments (National Institute of Child and Human Development, 2000b). The achievement gap in socioeconomic status (SES) is almost double the achievement gap between Black and White students, according to NAEP 2011. The gap is due in part to the low acquisition of vocabulary, which is attributed to the lack of cognitive development or the absence of social experiences and exposure to vocabulary that stem from these socioeconomic disparities (Casey, 2013). The early years are a critical period in a child's education; this is a time in which literacy interventions have the greatest impact on student achievement. Providing these opportunities for potentially large literacy gains for struggling readers also results in the equalization of disparities among the lower- and higher-achieving students (Vaughn, Linan-Thompson, & Hickman-Davis, 2003).

Measures of accountability in public schools have been longstanding and can be linked back to 1957, when the Soviet Union beat America to space with the launching of *Sputnik* (Powell, 2007). The US responded to this defeat with a critical review of the educational system, which resulted in a call for reform in the areas of science and technology. Over 50 years later, the national debate on education reform continues to

draw many actors into the arena, all of whom are seeking to improve education throughout the country. In the 1980s, the publication of *A Nation at Risk*, by the National Commission on Excellence in Education (1983) led to increased scrutiny of the public school system. In this report, it was claimed that the educational foundation of the US were being eroded by mediocrity, which threatened its future. The release of this document by President Reagan's National Commission on Excellence in Education helped to frame the way in which Americans thought about the public education system (Borek, 2008).

Accountability was raised to a new level of supposition when President George W. Bush signed the No Child Left Behind law, updating the Elementary and Secondary Education Act. This act sought to advance American competitiveness and close the achievement gap between poor and minority students and their more advantaged peers. This, according to some authors, was a worthwhile and admirable goal (Ellis, 2007). NCLB required districts to disaggregate and report student test scores, which began to expose the serious deficiencies among many of the country's most vulnerable students—that is, those living in poverty (Henderson, 2012).

One of the goals of NCLB was the establishment of reading intervention programs that were based on scientific research for at-risk students in kindergarten through third grade (NCLB, 2002). The Leveled Literacy Intervention (LLI) program, a small-group reading intervention and scientifically researched-based program, noted significant improvement in students' reading achievement and is a feasible program for districts seeking research-based interventions to address the needs of their at-risk population (Ransford-Kaldon et al., 2010).

The Individuals with Disabilities Education Act (IDEA) is legislation that ensures that students with disabilities are afforded a free and appropriate education that meets their needs. Districts rely on one of the components of IDEA, which requires a tiered approach to reading instruction (IDEA.gov, 2013). The essential elements of Response to Intervention (RTI) include a continuum of evidence-based services, ranging from universal instruction to highly intensive intervention, that are available to all students (Fairbanks, Guardino, Lathrop & Sugai 2007). Tier one consists of the district's core curriculum, based on which reading instruction is differentiated by the teacher in the classroom. Tier two is typically a small-group intervention, which may consist of a strategy group lesson or guided reading lesson in the class or a pull-out/push-in more targeted instruction to address the specific needs of the student. Tier three is the most intensive intervention intended for nonclassified students at a higher risk of failure. This instruction may include programs such as Marie Clay's Reading Recovery or Fountas & Pinnell's LLI. If students do not reach proficiency after documented and monitored support in all three tiers is unsuccessful, they may be considered for special education (Shapiro, 2013).

LLI can fit in either tier two or tier three of the RTI framework. The framework for LLI is research based and, according to Fountas and Pinnell (2010), contains high-quality texts. The system requires that texts be reread several times, which has been proven to improve fluency and comprehension (Chard & Kameenui, 2000). The LLI system also requires that teachers gather anecdotal data on all students daily and that running records are conducted on each student at least once a week. Another requirement is that from kindergarten to Grade 3, groups have a maximum of four

students. One LLI study, conducted by Hof-Dunn and consisting of six classrooms led by six certified reading specialists for a period of one school year, collected and analyzed data from 61 students. This study looked at the progress of both first- and second-grade students in one school to determine whether LLI had a positive impact on both the reading and writing achievements of the students in the program. The findings revealed that the program showed significant gains with regard to students' reading and writing progress (Hof-Dunn, 2015). Another broad study conducted by Ransford-Kaldon et al. (2010) revealed that students receiving the LLI treatment outperformed the control group by one to three levels in kindergarten and Grade 1; however, the results narrowed in the second grade, where the LLI group outperformed the control group by less than one benchmark level. The researchers noted that similar studies need to be conducted among a more diverse population of at-risk students.

The cost of LLI is significant and can impose barriers for full implementation for districts that have limited fiscal resources. One LLI system ranges in cost from \$2,700 to \$4,500, US dollars; full implementation would require the purchase of multiple kits, as well as individual components, which may be cost prohibitive. School-level and district administrators charged with identifying scientifically based literacy interventions seek programs that yield significant results. The researcher in this study will seek to provide school-level and district administrators with data on the efficacy of LLI with regard to improved reading achievement.

Statement of the Problem

Students who are not reading proficiently by the end of the third grade are four times more likely than proficient readers to drop out of high school (Hernandez, 2011). This fact and other recent research on the importance of early literacy skills have culminated in an intense focus on improving third-grade reading proficiency (Rose, Schimke, & Education Commission of the States, 2012). When implemented effectively, early interventions can help remedy this epidemic (Chard et al., 2008). The effective implementation of research-based intervention programs targeted at meeting the needs of early learners can aid in closing the achievement gap in later years (Cummings, Kaminski, Good, & O'Neil, 2011). If these lags are corrected by Grade 3, it is more likely that students will become successful citizens who contribute to the global economy (Hernandez, 2011).

Early literacy is linked to academic achievement and increases in graduation rates, resulting in a better chance of students continuing their education (Strickland & Riley-Ayers, 2013). Although standardized assessments are used to measure success in NCLB, ESSA, and other standards-based education reform efforts, they provide little information to aid teachers in improving students' reading skills. To achieve success on these national accountability measures and to become proficient readers, students must be taught to use strategies to comprehend, summarize, and identify main ideas, as well as recall details. They must learn to use these strategies effectively in tandem with reading (Fountas & Pinnell, 2009).

As accountability measures are tightened, teachers make considerable effort to correct reading deficits early in a child's education. It is imperative that administrators

seek programs that yield the greatest growth in literacy acquisition. Teachers must differentiate instruction if they are to meet the diverse needs of the students in their charge. They face the challenge of supporting all students to ensure that they are achieving grade-level proficiency on standardized assessments by the end of the third grade. District and school-based administrators could benefit from an evaluation of reading intervention programs and their effect on sustained reading achievement for at-risk learners.

Research has shown that students receiving LLI in the early grades (K–2) demonstrate significant gains when the program is implemented with fidelity. However, little research shows the sustained academic benefits for students who have participated in the LLI program. Moreover, little research demonstrates how students' performance on the Developmental Reading Assessment II (DRAII), which is designed to help teachers systematically observe, record, and evaluate changes in students' reading performance, correlates with their performance on other assessments, particularly state-mandated standardized assessments. The problem this study seeks to address is whether students demonstrate significant reading gains after their participation in a reading intervention program and, if so, whether these gains are sustainable. It will also seek to determine whether these skills transfer to competency on statewide standardized assessments.

Research Questions

This study is being conducted to evaluate the effectiveness of the LLI program on students' text-level growth and the longitudinal progression over three years of students

who have been in the LLI program and those who have not. The following questions will be answered:

1. To what extent did the first-grade students who participated in the LLI program show significant growth compared to the students who did not participate in the LLI program?

- a. How does gender moderate the effects of LLI on students' academic performance?
- b. How does SES moderate the effects of LLI on students' academic performance?
- c. How does ethnicity moderate the effects of LLI on students' academic performance?

2. In determining the sustaining effects, the following research question is posed: Was there a significant difference in performance on the Grade 3 Partnership for Assessment of Readiness for College and Careers (PARCC) Language Arts (LA) assessment between students who received LLI in the first grade and those who did not?

Purpose

This public school district uses tier-one and tier-two early interventions as a means to improve academic achievement and narrow the achievement gap. The primary focus of these interventions is to develop the literacy skills of students from kindergarten to Grade 5. When students enter middle school, the intervention models change significantly, and there is less early literacy support available. It is designed this way to address literacy foundational skills at the outset to provide students with the

skills they need to become proficient readers. LLI is used in all four of the elementary schools in the district.

The purpose of this study was to determine whether the LLI intervention affects at-risk first-grade students' immediate and long-term literacy development. The study used a treatment/control group design and spanned the years from 2013 to 2016. It included a total of 348 first-grade students who attended one of the four elementary schools in the 2013–2014 school year. Of the 348 first-grade students, 65 received the LLI intervention. Chi-square equivalency tests were used to determine the validity of a subsample of those who did not receive the intervention.

Significance of the Study

Demands for accountability continue to be placed on school administrators to ensure high levels of student achievement. Achieving excellence by reaching and surpassing school goals has been at the forefront of many homogeneous suburban districts nationally. These districts continue to occupy the highest standings in every school-ranking list published. Achieving excellence and equity, however, is a goal that has yet to be attained due to disparities in academic performance between our high and low socioeconomic status groups (Casey, 2013). The research tells us that third-grade reading proficiency levels are a critical variable in predicting the future success of our students (Hernandez, 2011; Rose et al., 2012).

In his book *Toward Excellence with Equity: An Emerging Vision for Closing the Achievement Gap*, Ronald Ferguson (2007) claimed that the educational achievement gap can be eliminated by eradicating the basic skills gap. Over time, eliminating this gap

in basic skills mastery will wipe out racial inequality: “Efforts to improve basic skills need to become central to our strategic understanding of how to achieve racial equality in the United States” (p. 3). The research conducted in this study will add to the literature on research-based intervention programs—specifically LLI—and its impact on closing literacy gaps among early learners.

Various studies have been undertaken to determine the efficacy of the LLI program on reading achievement (Becker, 2015; Harvey, 2011). This study will seek to discover differences in text-level reading growth when controlling for the initial DRAII level, gender, ethnicity, and SES. The results of this study will add to the research on reading intervention programs and will benefit the field of education by examining whether participation in the LLI program has a significant effect on students’ reading achievement and, if so, whether the gains are sustained as they progress through the third grade. Very little research and data are available to indicate how students who successfully discontinue LLI beyond the year of implementation continue to perform relative to their peers.

Theoretical Framework

Constructivist learning theory serves as the theoretical framework for this study. Constructivism is a theory positing that people construct their own understandings and knowledge of the world based on their own experiences. Lev Vygotsky, a Soviet psychologist and constructivist theorist, developed the zone of proximal development (ZPD), defined by Vygotsky as the difference between what students can do without help and what they can do with help. It is “the distance between the actual developmental level as determined by independent problem solving and the level of

potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers” (Vygotsky, 1978, p. 86). Vygotsky believed that when a child was in the ZPD, with the proper assistance he or she could be “boosted” out of the ZPD and enabled to achieve the task.

The early years are a critical period—a time in which reading interventions are most effective. During this time, providing opportunities for low-achieving students to make potentially large gains will assist in equalizing the disparities among the lower and the higher achievers (Vaughn et al., 2003). Collaborative learning is a process of peer interaction in which a teacher guides the learners (Driscoll, 2005). When students are provided with the appropriate level of instruction, at the right time, they will be able to achieve tasks that would otherwise have been too difficult for them to accomplish (Vygotsky, 1978). In the constructivist classroom, students are urged to be active participants. LLI is founded on the premise that early intervention is critical to closing the achievement gap and that explicit small-group instruction will assist in addressing the skill deficits of the at-risk learner (Fountas & Pinnell, 2009).

Vygotsky’s belief was that the role of education should be to provide children with experiences in their ZPD in the effort to encourage and advance their learning (Berk & Winsler, 1995). Applying the ZPD to educational contexts, sociocultural theorists developed the concept of scaffolding. This refers to a process in which the teacher guides the child’s learning, according to his or her needs, with more focused questions and interactions, and it allows a teacher or peer to aid the student with his or her ZPD as needed (Balaban, 1995).

Context

At the conclusion of the 2013–2014 school year, students in Grades 3 through 8 in New Jersey public schools were administered the last New Jersey Assessment of Skills and Knowledge (NJASK) in language arts and math. This standardized assessment was measured based on proficiency levels in both language arts and math, with a maximum score of 300 points in each area. Due to increasing accountability measures, when the NJASK scores were released in 2013, there was a sense of urgency to address the continuing decline in the literacy scores of the elementary students throughout the state.

The NJASK had three proficiency measures: partially proficient, proficient, and advanced proficient. The highest level a student can attain is advanced proficient, which is achieved by obtaining a score of 250 or higher. Proficient levels (achieved by a majority of non-special needs students) were noted by scores between 200 and 250. Any score below 200 resulted in the lowest possible level—partially proficient (NJDOE, 2009). The results of this assessment in the Central New Jersey school district used in this study showed a continuing decline in the language arts scores of students in Grades 3 through 5; however, the lower socioeconomic and minority students (Hispanic and Black) continued to lag even further behind their White and Asian peers.

A student performing at the partially proficient level demonstrates a limited ability to employ the strategies needed to understand a variety of texts at the literal level. He or she may demonstrate some understanding of the central idea, supporting details, purpose, and organization of the text and may express some understanding of the text in written responses. A student at this level demonstrates an inconsistent ability to

connect ideas, summarize relevant details, make inferences, and draw appropriate conclusions about the text in written responses (NJDOE 2009). The district's students in the partially proficient range are considered at risk and represent 43% of students in Grades 3 through 5.

A closer look at the data using a district-wide norm-referenced assessment (Link-It) revealed that 70% of the population in Grade 3 either showed no improvement or had a negative growth rate of 23% in the area of language arts. Grade 4 students in the district showed a similar decline, with 74% of all fourth graders showing a zero to negative growth rate of 13%, while 66% of the fifth graders showed an average of 11% negative growth.

This Central New Jersey school district offers a rigorous language arts curriculum, as well as a variety of programs to address the diverse needs of their students. The LLI program addresses fluency and comprehension concerns for at-risk students and, effective school year 2013–2014, was used in all four of the elementary schools in the district.

Delimitations and Limitations of the Study

This study examined only the literacy growth of first-grade students selected from four elementary schools in a pre-K–12 public school district located in Central New Jersey. The sample size is limited to students enrolled in this school district. Students in the treatment group were selected based on participation in the district's academic support program, as well as their reading level. The study did not include students beginning the year reading at grade level.

This study was conducted in a moderately small, diverse, suburban school district located in Central New Jersey; therefore, it is not representative of all populations. The data in the study are limited to the information housed at each of the elementary schools in the district. Schools may or may not have maintained consistent data for students enrolled in support programs; therefore, the specific length of the intervention could not be established for all students participating in the LLI program.

The impact of participation was studied for one year, and the year studied was the district's implementation year. Fluctuations in the district administration impacted the oversight of support programs. A shift in programming choice and management occurred, resulting in the principals maintaining school-based decision-making and control over the intervention programs offered at each school. This enabled choice, which resulted in the implementation of a variety of support programs at each elementary school. The year of implementation was the first year in which all schools were mandated to offer LLI as the primary literacy intervention. Some teachers were resistant to the change, and fidelity checks of the implementation of LLI were not possible.

Teacher expertise and student placement in the LLI program cannot be controlled for in this study. Student selection for the intervention program was determined by each school. Other school-based decisions include criteria for exiting the program, procedures for collaborating between classroom and intervention teachers, and expectations and guidelines for program scheduling and attendance. Once the students were placed in LLI, they typically remained in the intervention program for the duration of the year or until grade-level competency was achieved; however, the data

gathered are limited to student achievement and do not include student attendance in intervention sessions.

Definition of Terms

The following definitions are provided to ensure uniformity and to enable an understanding of these terms as they are introduced and used throughout this study.

Achievement gap – Achievement gaps occur when one group of students (such as students grouped by race/ethnicity, gender, or SES) outperforms another group and the difference in average scores for the two groups is statistically significant (NCES).

LLI – Fountas & Pinnell's LLI is a small-group, supplementary intervention system that was designed to help teachers provide powerful, daily, small-group instruction for students who are not achieving grade-level expectations in reading (Heinemann, 2015).

Causal comparative design – This is a design method used in research studies that attempts to determine a causative relationship between a dependent variable and independent variable and essentially establish cause and effect between the groups identified in the study.

Scientifically based literacy interventions – These are literacy practices that have been evaluated using rigorous, systematic, and objective procedures to determine whether the program is effective (US Department of Education).

Accommodations – These refer to practices and procedures that provide students with disabilities with equitable access to instructional materials and assessments. Below is a brief description of each category:

- Presentation accommodations change the method or format in which a test is provided to students. These may include the use of Braille, for example.
- Response accommodations allow for changes in the ways in which students can answer test questions. Dictation is an example.
- Timing and scheduling accommodations include extending the time allowed for testing or allowing a student to take frequent breaks (PARCC, 2015).

PARCC Assessment – The PARCC system is a cohesive set of tests that students take during the school year that include summative (performance-based and short-answer questions) and non-summative components (diagnostic, midyear, and speaking and listening tools). This comprehensive and cohesive system is intended to better inform instruction and provide critical information to students, teachers, and parents about student learning throughout the school year (PARCC, 2015).

CHAPTER II

LITERATURE REVIEW

Introduction

This literature review seeks to examine scientifically based literacy interventions and strategies that address reading deficits in the area of reading comprehension, decoding, and fluency for at-risk learners in elementary public school settings. The review is organized topically; articles and studies were found in the following databases: ProQuest, SAGE, and the Education Resources Information Center, all of which was accessed through the Walsh Library at Seton Hall University.

The purpose of this study is to examine the effects of a tier-two reading intervention system—LLI—on the reading progress of struggling first graders. The same cohort will be examined at the end of Grade 3 to determine whether the gains were sustained, as evidenced by their performance on the PARCC LA assessment. The LLI system, developed by Irene Fountas and Gay Su Pinnell, focuses on improving the reading skills of struggling readers in the primary grades (Heinemann, 2015). The study illuminates the impact of effective reading instruction when intervening early on in primary grades.

This chapter represents a review of the major research relative to the topic of effective reading intervention programs, specifically LLI. Scientifically based reading instructional practices are examined, and there is an in-depth overview of the LLI program, its design, and its components.

A topical overview was developed to establish a global inspection of the areas that impact the acquisition of reading fluency, decoding, vocabulary, and

comprehension. The review of the literature includes the major topical themes relative to the problem statement:

1. LLI program
2. Early learning and intervention
3. Effective reading instructional practices

Leveled Literacy Intervention

LLI was created by Irene C. Fountas, a professor at Lesley University in Cambridge Massachusetts, and Gay Su Pinnell, a professor emeritus at the Ohio State University. It is a small-group, supplementary literacy intervention designed to help teachers provide daily, small-group instruction for the lowest-achieving students at their grade level (Fountas & Pinnell, 2010). The goal of this intervention program is to bring students who are reading below grade level up to grade-level reading proficiency within a specified time period. The design includes lessons across the seven systems, progressing from level A (beginning reading in kindergarten) through level Z (levels representing competencies at the middle and secondary school level) on the Fountas & Pinnell Text Level Gradient (Fountas & Pinnell, 2010).

An underlying premise of LLI is that children benefit from experience with texts they can read without difficulty at their “independent level,” which are books that a student can read with minimal challenge to foster reading growth, as well as with more challenging texts written at their “instructional level,” which are books that offer just enough difficult vocabulary and/or concepts to make reading interesting yet challenging with teacher support (Fountas & Pinnell, 2008). The students who are identified as in

need of support meet in small groups for 30 to 45 minutes per day, depending on their grade level. This short-term intervention should ideally last a maximum of 18 weeks; however, if students progress quickly, they exit prior to the prescribed maximum period (Fountas & Pinnell, 2008). According to the creators, LLI emphasizes the development of oral language skills as a foundation for reading, as well as the five components of reading instruction identified by the National Reading Panel (NRP) (National Institute of Child Health and Human Development, 2000a): phonological awareness, phonics, fluency, vocabulary, and comprehension (CREP, 2010). Each of these components will be further explored in the review of the literature.

Fountas and Pinnell promulgated that three main factors prevent success at improving reading achievement in schools: programs are not implemented with integrity and quality oversight, programs are not sustained long enough to see efficacy, and there are too many isolated attempts, rather than coordinated and comprehensive systems, to correct the deficits. The research shows that when implemented with fidelity and proper oversight, LLI is effective at raising reading proficiency for at-risk students, and it has noted improvement in reading comprehension in both ELLs and students classified as special needs (Harvey, 2001; Ransford-Kaldon, 2010).

Design

The LLI system provides daily support through explicit, fast-paced, direct instruction to groups of students from three to six, depending on their grade level. Some key ideas underlying the LLI design are that struggling readers learn best when lessons follow a predictable sequence (Fountas & Pinnell, 2010). The format of the LLI program

requires the same basic structure, allowing students to focus their attention on reading, writing, phonics, and word study activities. Students who are struggling with reading and writing need to learn how to process oral and written language quickly and automatically (Fountas & Pinnell, 1998).

Explicit, systematic reading instruction provided early in the kindergarten year is more beneficial to students who have been identified as at risk for reading failure than delaying reading intervention until midyear (Cooke, Kretlow, & Helf, 2010). In addition, early intervention has been promoted to reduce the Matthew Effect in reading, which essentially means that the gap between at-risk readers and proficient readers widens as the years go on, due to the exposure to text (poor readers read less than good readers), lags in language development, and limited general knowledge, all of which lead to lower IQs (Stanovich, 1986). This reciprocal causation can be abolished through the implementation of early intervention. The findings of the Center for Research and Education Policy (CREP) suggest that students in kindergarten should begin instruction as soon as possible—ideally after being in school for 14 weeks—to provide the recommended amount of intervention (CREP, 2010). There is a grave risk of long-term effects on our poor readers. If a child is a poor reader in the first grade, there is a 90% chance that he or she will remain a poor reader at the end of the fourth grade (Juel, 1998).

Meeting the diverse needs of students through a coordinated approach with high-quality instruction at their level will move them closer to their pursuit of literacy acquisition. In their book *When Readers Struggle: Teaching that Works*, Fountas and Pinnell (2009) claimed that there is no one-size-fits-all intervention that will meet the

diverse needs of all learners. This pedagogical companion is highly recommended to be used alongside LLI to help address the varied needs of all students in the classroom.

The LLI program design requires short-term, extensive instruction with a maximum enrollment expectation of 18 weeks. Students meet for 30 to 45 minutes per day, depending on their grade levels. Students in kindergarten through the second grade meet in groups of up to three for 30 minutes per day, while students in third through fifth grades meet for 45 minutes daily, and groups may contain four to six students.

As a primary intervention, LLI focuses on developing effective early writing strategies and includes phonics and comprehension instruction. Systems are designed to work with primary, intermediate, and middle- and high-school students. The intermediate and high-school systems are slightly different from the primary school system.

The components of effective reading instruction identified by the NRP—phonemic awareness, phonics, fluency, comprehension, and vocabulary—are all incorporated into the LLI program. When early intervention is incorporated into an instructional program that is supplemental to a rigorous LA curriculum, greater potential for accelerated growth is noted (Juel, 1998).

The LLI program consists of teacher manuals, high-quality leveled books, parent correspondence, learning activities, word work, literacy games, and explicit ready-made lesson plans. The system is designed to improve the literacy of students with the lowest literacy proficiency in each grade level. Supplemental lessons are administered in small groups (three to four students in each group is strongly recommended) for a period of

45 minutes, depending on the grade. Students are provided with a fast-paced lesson that is focused on comprehension, writing, phonics, and fluency. High-interest texts are used to capture and maintain the students' attention; frequent assessments and progress monitoring are embedded in the program (Ransford et al., 2010).

Each LLI lesson follows a script, which is provided for the instructor and rotates on a two-day schedule. The lesson format for primary grades is based on a two-day rotation of odd-numbered and even-numbered lessons. On days when odd-numbered lessons are presented, students receive phonics and word work and are introduced to a new book that is suitable for their instructional level. During even-numbered lessons, students receive phonics and word work with a focus on writing about reading. On even-numbered days, students work with books that are suitable for their independent reading levels.

Students at the primary level read two to three books per 30-minute intervention period. The lessons incorporate both nonfiction and fiction texts, which are at students' independent and instructional reading levels. Research shows that students become stronger readers with structured practice, which improves both fluency and stamina (Allington, 2011, Yopp & Yopp, 2012). A major facet of this intervention program is that students spend time reading material with which they are comfortable, as well as texts that challenge them to become better readers. Therefore, time is allotted for reading a rich variety of texts that are not difficult, as well as texts that will continue to improve students' literacy acquisition.

Schools have been successful in implementing intervention programs with scientifically based reading instruction while monitoring students' progress toward

grade-level reading competence (Ransford et al., 2010). Scientifically based reading instruction should include the components of reading that have been proven to improve students' reading ability. These components include phonemic awareness, phonics, fluency, vocabulary, and comprehension in varying degrees, depending on students' needs. To improve reading outcomes, these struggling readers should receive instruction that differs from the routines that were proven ineffective (O'Connor, Fulmer, Harty, & Bell, 2005).

Related LLI Research

In a study conducted by Hof-Dun (2015), a total of six classrooms in one school led by six different certified reading specialists were studied for one school year, and data from 61 students were collected and analyzed. This study was conducted in a suburban setting and examined the effects of LLI on the reading and writing achievement of first- and second-grade students in the program. The results revealed that the intervention had a significant effect on students' reading and writing progress (Hof-Dunn, 2015). Another study measuring students' growth in the LLI program utilized a randomized controlled trial to determine teachers' perceptions of LLI and the benchmark-level gains of students in the program (Ransford-Kaldon et al., 2010). Through the use of surveys and observations, using the Benchmark Assessment Kit and the Dynamic Indicators of Basic Early Literacy Skills, which are a set of procedures and measures for assessing the acquisition of early literacy skills from kindergarten through sixth grade to monitor progress, the study found that LLI positively impacted students' reading development. The LLI participants exceeded the control group by one to two levels. The LLI participants outperformed the others from kindergarten to Grade

1; however, the students in LLI in Grade 2 outperformed the control group by less than one level (Ransford-Kaldon et al., 2010).

For studies that examined students' progress when LLI was their sole intervention, the results are promising. In a study conducted at three schools comparing the results of students in LLI and students in the Reading Recovery program, the latter participants showed a greater increase in text levels than the LLI participants; however, the results were not significant (Harvey, 2011). In another study comparing students in the first grade who received either LLI or Science Research Associate (SRA), the results revealed that the students receiving SRA outperformed the LLI students. Once again, the results were not significant (Gabriel, 2012).

In a study that examined LLI's effect on reading with second-grade at-risk students compared to students who did not receive LLI, the results showed significant progress on the Measure of Academic Progress, a computerized adaptive test, although students who did not receive LLI as an intervention showed greater progress than those who did. In this study, the LLI participants showed no significant difference with regard to their reading progress (Burton-Richie, 2014). Two studies of students in Grades 3 to 5 using LLI to improve reading comprehension were reviewed; both revealed significant reading gains with the use of the program (Metz, 2014; Stukel-Schulte, 2010).

While the findings in this literature review reveal positive, negative, and neutral results from the implementation of LLI, there is a need for additional research, including studies that analyze the long-term impact of the intervention. The challenge faced is to examine whether gains from the intervention are sustained when measured by standardized assessments in later years. In a study on the long-term outcomes of early

intervention programs, approximately 400 children were pretested and assigned to one of three groups: 95 were assigned to Reading Recovery, 97 to phonological training, and the remainder acted as controls. In the short and medium term, both interventions improved students' reading significantly, with Reading Recovery having a broader and more powerful effect. In the long term, 3.5 years after the intervention, there were no significant effects on reading overall, though Reading Recovery had a significant effect on a subgroup of children who were complete non-readers at six years old (Hurry & Silva, 2007). The results of this study confirmed the positive impact of the interventions in the short term; however, they failed to substantiate whether the improvements were sustained and led to improved performance in future years.

Early Learning Intervention

Based on the findings of the research, many children entering school with little to no literacy skills and struggling with learning to read and write are offered intervention early due to its positive impact on literacy acquisition (NRP, 2000; Wasik & Slavin, 1993). Reading failure has exacted a tremendous long-term consequence on students' self-confidence, their motivation to learn, as well as their later school performance. Beginning readers should be provided with instruction that is both explicit and systematic to eliminate these hurdles and to ensure early success (Lane, Lloyd, & Pullen, 2005; NRP, 2000).

The first school years have long-lasting effects on children's subsequent achievement. Children who are not reading proficiently by Grade 4 are four times more likely to drop out of high school (NAEP, 2012). The first few years of life are critical in

part because the brain, which seems pre-wired for learning, is developing at a rapid rate. The information provided through early experiences helps to shape the child's neural pathways, thereby setting the stage for future learning (Sandman & Kemp, 2007). The learning that takes place from birth to age five may surpass any other five-year period across a lifetime (Coleman, 2011). Most children will develop naturally; however, some will require early intervention for success in later years. Early intervention is critical for at-risk students (McCormick, 2006).

Justice et al. (2001) defined school readiness as a multidimensional construct that encompasses both skill-based competencies (e.g., reading and mathematics abilities) and social, behavioral, and self-regulatory skills that enable children to socialize with peers, communicate effectively, and engage and persist in structured and unstructured tasks. School readiness continues to be a strong predictor of student success (McCormick, 2006). Students entering kindergarten with literacy and numeracy foundation skills are more likely to succeed than those without; this has been documented over years of research and practice. There is also a considerable body of literature indicating that classroom practices strongly influence student outcomes (Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002).

Students respond to instruction and use stimuli differently in the context of learning. Children with poor academic skills seem to benefit from teacher-directed instruction (Huffman & Speer, 2000). To be effective, programs and practices developed to address the needs of at-risk learners in their early years must be developmentally appropriate. The National Association for the Education of Young Children defines developmentally appropriate practice as a framework of principles and guidelines for

best practice in the care and education of young children that is grounded both in the research on how young children develop and learn, as well as what is known about educational effectiveness to promote young children's optimal learning and development (NAEYC, 2009). Without effective, focused instruction, it is hypothesized that students will increasingly struggle in school as they experience the growing demands of subsequent grade levels.

Early learning initiatives have been at the forefront nationally. Research shows that the alignment of policies and practices is especially important through the third grade, when children develop important social-emotional and cognitive skills that are essential for later learning. Teachers need to be aware of all students' learning needs, as well as expected learning outcomes. Through the promotion of school readiness in the community, the impact of school failure may be reduced (Ramey & Ramey, 2004).

Ideally, all students should enter kindergarten with the readiness skills needed to become successful readers. There is a definitive need to provide early learning experiences for those who do not have the means nor the knowledge to provide the fundamental literacy skills to their children. When students enter school far behind their peers because they did not attend preschool, they are beginning with a gap that is difficult to close as they continue schooling (Hurry & Silva, 2007). It is imperative to close this achievement gap in the first three years of their education to prevent the gap from growing (Stanovich, 1986).

Effective Reading Instructional Practices

RTI

In an effort to remedy the epidemic of illiteracy and to address this issue that policy makers, politicians, and educators have been battling over for the past two decades, consensus regarding how we teach reading has to be solidified. With the reauthorization of the IDEA signed into law in December 2004, provisions in the law state that early intervening services must put in place “a set of coordinated services for students in kindergarten through grade twelve who are not currently identified as needing special education or related services, but who need additional academic and behavioral support to succeed in a general education environment” (20 U.S.C. 1413(f)(1)). IDEA explicitly states that RTI can and should be used to identify and support students who may possibly be identified as having a disability.

RTI is an intervention model that is focused on providing assessment and support within a tiered framework, with increasing levels of support provided to students who continue to struggle primarily in the areas of language and literacy (Fuchs, Mock, Morgan, & Young, 2003). The basic RTI model has been conceptualized as a three-tiered prevention model, with primary intervention consisting of the general education program; secondary intervention involving fixed-duration, targeted, evidence-based, small-group interventions; and tertiary intervention involving individualized and intensive services that may or may not be similar to traditional special education services (Bradley, Danielson, & Doolittle, 2005). This three-tiered framework starts at tier one, where students are screened to determine whether classroom instruction is meeting the needs of the majority of the students in the class. Tier two is more specialized

instruction implemented in small groups for students who, despite receiving high-quality instruction, are not making adequate progress in the class. Tier three involves more intensive, individualized instruction for those who continue to struggle in tier two (Coleman, Buysse, & Nueitzel, 2006).

The components that are essential to the process include collaboration between classroom teachers and specialists, the implementation of a problem-solving process, continuous progress monitoring, research-based curriculum and instruction, and systematic assessment of the fidelity with which instruction and intervention are provided (Fuchs, Fuchs, Hosp, & Jenkins, 2001). Operationalizing the effective implementation of an RTI system is crucial to its success in a district. RTI is broadly defined as a process in which students receive quality instruction in the classroom, their progress is closely and accurately monitored, and additional instruction is given as needed (Bradley, Danielson, & Doolittle, 2005).

National Reading Panel: Five Pillars

In 2000, the NRP conducted an extensive review focusing on findings regarding students in kindergarten through the third grade and on the research findings of more than 100,000 studies; they identified five essential elements of effective reading instruction, commonly known as the “Five Pillars”: phonemic awareness, phonics, fluency, vocabulary, and comprehension. Research in subsequent years has continued to refer to this work when seeking solutions for the literacy gap and determining the factors that impact the teaching of reading. The research suggests that administrators

should use these pillars as a reference when determining effective programming and instruction.

Phonemic Awareness

The first pillar—phonemic awareness—is the ability to recognize and manipulate spoken words by blending, deleting, and substituting these sounds (Howard, 2009). Phonics and phonemic awareness are not one and the same. Phonemic awareness gives students a basis for reading new words, is the understanding that the sounds of spoken language work together to make words, and teaches them to attend to sounds and form a connection between sound and print (NELP, 2008). Phonemic awareness is auditory—not involving words in print. There is also a difference between phonemic awareness and phonological awareness; in fact, phonemic awareness is a sub-skill of phonological awareness (NRP, 2000).

Phonemic awareness is recommended to be taught for 15 minutes a day in isolation and should be incorporated into small groups versus whole classes. While some children may need more explicit forms of phonemic awareness training, most develop this understanding with language play in the context of rhyming texts and songs (Opitz, 2000). Children who are read to at home demonstrate greater literacy success and are more likely to easily develop phonemic awareness (NELP, 2008). Children who are not read to may struggle with the concept of breaking words apart and may require additional instruction (NELP, 2008).

Phonics

Making the connection between sounds and letters is phonics. The purpose of phonics instruction is to teach students the systematic relationship that exists between letters and sounds, which will allow them to decode and read written words. Phonics is the understanding that there is a predictable relationship between phonemes and graphemes, which are the letters that represent those sounds in written language. If children are to benefit from phonics instruction, they need to have phonemic awareness (CIERA, 2000). This is also what is referred to as the alphabetic principle. There are simply too many words in the English language to rely on memorization as a primary word identification strategy (Bay Area Reading Task Force, 1997).

Letter-sound knowledge is a prerequisite to effective word identification. A primary difference between good and poor readers is the ability to use letter-sound correspondence to identify words (Juel, 1991). According to Juel, strategies to teach this skill are presented in both the classroom and in reading support programs to provide at-risk readers with the foundation needed to succeed. During the alphabetic phase, readers must have practice phonologically recoding the same words to become familiar with spelling patterns (Ehri, 1991). The findings of the NRP were that students benefited from explicit phonics instruction from kindergarten to Grade 6 (NRP, 2000).

Fluency

Another practice that strongly influences reading ability is fluency, which is defined as the ability to easily recognize words and read with speed, accuracy, and expression. Students must practice reading to build fluency, which will, in turn, allow

them to better understand what they are reading (Chard & Kameenui, 2000). Proficient readers are so automatic with each component skill (phonological awareness, decoding, and vocabulary) that they focus their attention on constructing meaning from print (Kuhn & Stahl, 2000). Fluency instruction connects phonics and comprehension (Chard & Kameenui, 2000). When children are able to read both quickly and accurately, their focus is primarily on understanding what they read instead of decoding the words. Readers must know when to pause and break and chunk words together to form meaning (Raskinski, 2004). Fluency is developed over time and differs depending on what is being read. Oral reading performance is a significant indicator of overall reading ability and comprises three key elements: accuracy, rate, and fluency (Fuchs et al., 2001). Oral reading performance, measured by the components of accuracy, rate, and fluency, constitutes a cluster of critical literacy proficiencies and functions as a significant indicator of overall reading ability (NAEP, 2002).

In a study of oral reading conducted by the NAEP, students who scored low on measures of fluency also scored low on measures of comprehension. This suggests that, in many American classrooms, fluency is a neglected reading skill, which affects many students' reading comprehension (NAEP, 2002).

Vocabulary and Comprehension

Learning new words within text or in isolation aids in improving reading ability for everyone and is one of the pillars that have proven necessary in an effective reading program. Most vocabulary is acquired through everyday experiences (Chard & Kameenui, 2000). Children learn new vocabulary by engaging in daily conversations, by

listening to adults read, and by reading on their own. The more exposure they have to books and adult conversation, the richer their vocabulary. Conversely, some vocabulary should be presented to students through direct instruction, such as words that are more complex and are not a part of their daily experience or difficult words with complex concepts (NELP, 2000).

Research indicates that vocabulary and comprehension are linked. Teaching strategies related to ascertaining the meaning of unknown words, as well as general vocabulary building, are also essential to a strong program in comprehension instruction (Duke & Pearson, 2008). This involves presenting techniques that help students to understand what they read. It also involves establishing routines and highly effective processes that not only allow students to understand a variety of texts but also help to develop the strategies they will use for future texts. A large volume of work indicates that we can help students acquire the strategies and processes used by good readers, which will improve their overall comprehension (Duke & Pearson, 2009). A program that teaches effective strategies and allows time for application is what most researchers recommend. According to Duke and Pearson, some of these features include the following:

- Students must spend a large amount of time reading, applying the skills they have been taught.
- Experience reading real texts for real reasons. Students need experience reading texts beyond those designed solely for reading instruction, as well as experience reading text with a clear and compelling purpose in mind.

- Experience reading the range of text genres that we wish students to comprehend. Students will not learn to become excellent comprehenders of any given type of text without substantial experience reading and writing it. They must read and interpret a variety of texts, as well as be able to write.
- An environment rich in vocabulary and concept development through reading, experience, and, above all, discussion of words and their meanings. Any text comprehension depends on some relevant prior knowledge. Things such as hands-on activities, excursions, conversations, and other experiences are also needed to develop vocabulary and concept knowledge required to understand a given text.
- Substantial facility in the accurate and automatic decoding of words. In a recent review of the literature, Pressley (2000) argues compellingly that skilled decoding is necessary, although by no means sufficient, for skilled comprehension.
- Lots of time spent writing texts for others to comprehend. Again, students should experience writing the range of genres we wish them to be able to comprehend.
- An environment rich in high-quality talk about text. This should involve both teacher-to-student and student-to-student talk. It should include discussions of text processing at a number of levels, from clarifying basic material stated in the text to drawing interpretations of text material to relating the text to other texts, experiences, and reading goals. (2009, p.110)

Teaching reading in small groups is an effective means to reach all learners and address their diverse needs; however, instruction must be thoughtful, directed, and focused on scientifically based strategies that have been proven effective and validated with data.

In traditional reading instruction, students were not grouped according to their reading levels; instead, teachers used basal readers with comprehension questions to follow. Most series contained manuals to guide lessons, and books contained controlled vocabulary and workbooks for drills and practice. This approach used phonics as a focus of instruction and explicitly taught letter–sound correspondence. There was little if any choice involved in the reading selection; students were assigned a passage by the teacher and most often participated in round-robin reading. Engagement levels were low, and progress was slow, especially for the lower reading groups. Little if any time was given to practice reading independently. The research in this study demonstrates that teaching reading to students in small groups using texts at their level is an effective means to reach all learners. Providing opportunities for targeted instruction, as well as time for students to work independently with text, will help to address the specific needs of struggling readers who are at risk of literacy failure. Instruction must be thoughtful, directed, explicit, and focused on research-based strategies that have been proven effective and validated with data.

Summary

This study reviewed effective early literacy instructional practices and identified those that are most influential in improving literacy. It examined program characteristics that exemplified best practices and sought to identify efficient and effective instructional strategies when implemented with fidelity using a scientifically based program that is underpinned by the pillars of reading development that would predict sustained gains

following early intervention (Allington, 2011; Hurry & Silva, 2007; Juel, 1988; NRP, 2000).

School and district-level administrators continue to face the challenging decision regarding which, if any, intervention programs will yield the best results and meet the needs of all students. The focus of this literature review was to determine the implications of reading interventions for students who enter school below grade-level proficiency. The findings herein indicate that our students in this category require explicit, supplemental intervention that should be applied early on. Early intervention is critical to prevent the widening of the achievement gap. Literacy policy has implied that attacking this problem early on will, in fact, yield desirable results. Putting literacy in place in early childhood contexts has been assumed to be an effective means of promoting future success and pressing early-years teachers to deliver improved literacy outcomes (Comber & Nichols, 2004).

When a rigorous literacy curriculum is implemented and LLI is provided as a supplement to literacy instruction, it is consistent at raising the text levels of at-risk students (Ransford-Kaldon, 2010). There is no one remedy to address the needs of our at-risk learners, but a coordinated approach offering a variety of scientifically proven strategies and methods to meet the diverse needs of each student is recommended to improve literacy acquisition (Fountas & Pinnell, 2009).

CHAPTER III

METHODOLOGY

Research suggests that children who continue to struggle with reading and writing after 3rd grade are more likely to drop out of school (Casey, 2013). In an effort to alleviate the problem of low literacy in later years, early interventions are being implemented beginning in the first grade. The evidence shows that quality intervention programs that are implemented early can prevent long-term literacy deficiencies (Wanzek & Vaughn, 2008). This study seeks to evaluate the effectiveness of the LLI system on academic achievement and to determine whether gains are sustainable over a three-year period. Using text-level growth as a measure, the researcher compared the achievement results of students participating in the LLI program and those who have not received LLI, when controlling for initial DRAII text level.

Research Design

Correlational research is sometimes used to determine the possible existence of causation; however, it has a lower constraint level than causal-comparative research, and there is no active attempt to determine the effects of the independent variables (Martella, Nelson, & Marchand-Martella, 2013). Correlation can be very useful, but it does not provide us with data about the predictive power of variables. Causal-comparative research involves comparing two groups to explain existing differences between them regarding the variables of interest. Causal-comparative studies attempt to establish cause-and-effect relationships; in these studies, the groups have already been formed and, thus, are not randomly assigned, and any treatment has already been

given, which is the main difference from experimental research, in which groups are randomly assigned (Martella et al, 2013).

The researcher sought to analyze the results of students participating in a supplemental reading support intervention program—LLI—and the impact on improving their literacy acquisition. All four elementary schools in a Central New Jersey school district are currently using the LLI program. The causal–comparative design was used to determine the causes or consequences between the dependent variable; DRAII and PARCC LA scores and the covariates; and program participation, gender, ethnicity, and SES. Additionally, the aim was to determine whether these covariates moderate the effects of the intervention.

In causal–comparative research, the researcher does not randomly assign subjects to the intervention group or the comparison group (Martella et al , 2013). In this study, the groups were preordained, and there was no chance of random assignment. Chi-square tests were used for equivalency testing of a subsample of students who did not receive the LLI intervention. In an effort to create a valid control group, equivalency tests were utilized as a means to ensure that the control group and the treatment group were not significantly different and were, therefore, comparable.

Description of the Population

The township used in this study is located in Central New Jersey and has a population of approximately 40,472 (US Census, 2010). The public school district consists of six schools: four elementary schools, one middle school, and one high school. The school system currently serves approximately 6,097 students of an equally diverse population: African American, Asian, Caucasian and Hispanic, with a steady

increase in the Hispanic population. The elementary schools are similar in design and service like populations, with one school housing a larger special education group.

The total number of students in the district has increased over the past 10 years. Each elementary school averages between 720 and 750 students from kindergarten through Grade 5, with an average class size of 22 students. The schools offer varying supplemental support programs in an effort to address the diverse needs of the students in each school. However, after the successful pilot of LLI at one of the schools, the district mandated that, effective September 2013, each school begin to use Fountas & Pinnell's LLI system as the primary supplemental intervention program for its students who are reading below grade-level expectations.

Sample

The study participants were pulled from a total of 348 first-grade students who attended one of the four elementary schools in the 2013–2014 school year. Of the 348 first-grade students, 250 received no supplementary reading intervention at all. A total of sixty-five students were selected from all schools first-grade LLI participants. The criteria for selection were based solely on the availability of all the data needed for analysis. The DRAII scores of students in Grade 1 were analyzed to determine growth in the year of implementation. In addition, data from the cohorts' third-grade PARCC LA assessments were investigated to determine longitudinal progression.

The participants receiving LLI were first-grade students in a general education classroom during the implementation year (2013–2014). The selected students received LLI supplementary instruction in small groups of up to four students each for 45 minutes daily five days per week. They also received tier-one instruction in their general

education classroom. LLI is a supplementary program; it does not replace the general education LA curriculum but, rather, supplements instruction via pull-out sessions of up to 45 minutes daily. Selection to participate in the LLI supplemental reading support program at each school was based on individual student scores on the DRAII administered in the fall of 2013. Students scoring from one to four on the DRAII in the fall of 2013 were either below grade level or on the cusp of achieving grade-level proficiency scores in the first grade.

The second group of students in this study served as the control group and consisted of students in the same cohort of first-grade students who had similar DRAII results but did not receive the LLI intervention support for reading. These students remained in the general education classroom and received tier-one instruction using the general education curriculum from their classroom teachers.

All students in the study were followed through to Grade 3, where their PARCC LA scores were used to examine the long-term effects of the intervention and the impact on the students' performance on the state standardized assessment.

Data Collection

Each fall, all students from kindergarten to Grade 5 are administered the DRAII assessment by either the classroom teacher or an academic support teacher. The results from the DRAII were inputted into the Link-it database, the current district data management system, by a specified date. Upon receipt of the district PARCC scores, the file obtained from the state was exported by a third-party representative into the Link-it database and linked to each student record in the district. Gender, SES, and ethnicity are all included in the file submitted to the state for the mandated assessment;

therefore, the data were exported with the PARCC assessment proficiency levels.

The data for the study were taken from the Link-it database, exported by the district supervisor in charge of assessments, and then shared with the researcher. All identifiers of the participants in the study were removed prior to the analysis. Names and student numbers were removed, and numbers were assigned to each student. The researcher was provided with data that were limited for the sole use of this study. Human research subjects were ethically protected throughout the process.

Prior to entering the data into SPSS24, a software package used for logical batched and non-batched statistical analysis, the researcher validated all the data by extracting incomplete records. De-identified end-of-the-year data were exported as well and checked for accuracy once again to ensure that all records were complete. Any incomplete records or missing pre- or post-assessment scores were not considered in the study.

The researcher met with the superintendent to obtain permission for the study. Permission was granted to work with all four elementary schools on a study to evaluate the district's supplemental reading program used in the schools.

Instrumentation

The test instruments, DRAII and the Grade 3 PARCC LA assessment were analyzed to determine growth in reading levels and literacy achievement progress.

The DRAII is a formative reading assessment designed to identify a student's independent/instructional reading level, diagnose student-specific reading deficiencies, and provide the teacher with recommendations for scaffold support to increase the student's reading proficiency (DRA, 2009). This assessment is administered individually

to students by their classroom teacher or an academic support teacher during a testing window in the fall and again in the spring to establish pre- and post- results. It may also be administered at other points in the year—preferably midyear—to monitor student progress and further assess their instructional needs.

The DRAII Benchmark Assessment measures each student's reading proficiency through the systematic observation, recording, and evaluation of performance (DRA2, 2009). The test administration requires that students read a selection and then retell what they have read to the examiner. The level of text difficulty increases as text levels increase. Students continue to advance if levels are beyond instruction, or they will go down a level if the text is too complex.

A student's DRAII level (independent reading level) reflects his or her oral reading fluency (95% accuracy) and comprehension (90% accuracy) at independent performance levels (DRA2, 2009). The assessment results also serve as a single data point used in the district when determining the placement of kindergarten to Grade 3 students in supplemental reading intervention programs.

The DRAII was used in this study as the pretest and posttest assessments to determine text-level increases. Students in Grade 1 who were more than one level below grade-level proficiency on the fall DRAII were potential candidates for a supplemental intervention program. The DRAII is used in the district to assess the student's reading level upon his or her entry to kindergarten and every fall thereafter. For students participating in the district supplemental reading intervention program, reading levels are also assessed at the end of the year in May. Grade-level benchmark data are noted in Table 1, and seasonal suggested benchmarks are noted in Table 2.

Table 1

DRAII Grade-Level Benchmark Levels

Grade	Benchmark
Kindergarten	A-1 2 3
GRADE 1	4 6 8 10 12 14 16
GRADE 2	18 20 24 28
GRADE 3	30 34 38

Note. DRA2 (2009), Fountas and Pinnell (2008)

Table 2
DRAII Suggested Seasonal Benchmark Levels

Grade	Season	Benchmark	Performance levels
Kindergarten	Beginning Middle End	A 1 3	Developing Developing Independent
GRADE 1	Beginning Middle End	3 10 16	Independent Independent Independent
GRADE 2	Beginning Middle End	16 20 28	Independent Independent Independent
GRADE 3	Beginning Middle End	28 34 38	Independent Instructional Independent

Note. DRA2 (2009), Fountas and Pinnell (2008)

The data from this assessment are readily available immediately after the students complete the assessment. The DRAII text levels were used to determine the students' reading level progress from the beginning of the year to the end of year. There is some subjectivity, and the results may vary due to the discretion given to the examiner administering the assessment. This has caused some researchers to question the validity of the assessment in determining accurate reading levels. The DRAII is a district-mandated assessment that is used at all four elementary schools.

The PARCC is a criterion-referenced, standards-based assessment given annually to students in Grades 3 to 12. This assessment serves as the State of New Jersey's annual assessment, replacing the NJASK. Some key features of this

assessment include performance-level descriptors (PLDs) in both ELA/literacy and math. The PARCC test is intended to measure students' progress toward grade-level academic expectations. The test measures critical-thinking skills, persuasive writing, and problem solving. The PARCC is administered to all third graders in the spring within a state-mandated testing window. Unlike a norm-referenced test, the performance on this criterion-referenced assessment is based on students' mastery of a set of specific grade-level standards.

The ELA scores on PARCC fit into five performance levels, with scores ranging from 650 to 850. The PARCC framework indicates the following:

The PARCC complexity framework reflects the importance of text complexity as it relates to the CCSS, which indicates that 50 percent of an item's complexity is linked to the complexity of the text(s) used as the stimulus for that item. Consequently, to determine students' performance levels, it is critical to identify the pattern of responses when students respond to items linked to passages with distinct text complexities. To this end, PARCC has developed a clear and consistent model to define text complexity and has determined to use three text complexity levels: readily accessible, moderately complex, or very complex. (PARCC, 2015, p.1)

Table 3 below provides a summary of the PLDs for students in Grades 3 to 8 based on reading data collected from the PARCC assessment.

Table 3

Grade 3 PARCC English Language Arts/Literacy Performance-Level Descriptors

Performance level	Level of text complexity	Range of accuracy	Quality of evidence
5	Very complex Moderately complex Readily accessible	Mostly accurate Mostly accurate Accurate	Explicit Explicit Explicit
4	Very complex Moderately complex Readily accessible	Generally accurate Generally accurate Mostly accurate	Explicit Explicit Explicit
3	Very complex Moderately complex Readily accessible	Minimally accurate Generally accurate Mostly accurate	Explicit Explicit Explicit
2	Very complex Moderately complex Readily accessible	Inaccurate Generally accurate Partially accurate	Explicit Explicit Explicit

(PARCC, 2015)

The following are interpretations of each PLD:

Accurate – The student is able to accurately state both the general ideas expressed in the text(s) and the key and supporting details. The response is complete, and the student demonstrates full understanding.

Mostly accurate – The student is able to accurately state most of the general ideas expressed in the text(s) and the key and supporting details, but the response is incomplete or contains minor inaccuracies. The student demonstrates understanding.

Generally accurate – The student is able to accurately state the gist of the text(s) but fails to accurately state the key and supporting details in the text or to

connect such details to the overarching meaning of the text(s). The student demonstrates basic understanding.

Partially accurate – The student is able to accurately state the gist of the text(s) but is unable to state some of the key or supporting details with accuracy. The student is partially able to connect the specific details of the text to the overarching meaning(s) of the text. The student demonstrates partial understanding.

Minimally accurate – The student is unable to accurately state the gist of the text(s) but is able to minimally state some of the key or supporting details with accuracy. The student does not connect the specific details of the text to the overarching meaning(s) of the text. The student demonstrates minimal understanding.

Inaccurate – The student is unable to accurately state either the gist of the text or the key and supporting details evident in the text. The student demonstrates limited understanding (PARCC, 2015).

Students' performance levels were also linked to proficiency levels, which helped with the interpretation of the results as they related to grade-level expectations. Based on their individual scores, students were assigned a proficiency level from 1 to 5, defined as follows: 5 – Exceeded expectations, 4 – Met expectations, 3 – Approached expectations, 2 – Partially met expectations, or 1 – Has not yet met expectations.

Specified time limits were provided for each unit, and students had to complete the assessment in the allotted time per unit (testing session). Students with disabilities and English learners were eligible for an extended time accommodation.

General education students had 90 minutes to complete units one and three of the third-grade LA assessment and 75 minutes to complete unit two.

Variables

In this study, the dependent variables—what is being impacted—are DRAII scores and PARCC LA scores. The researcher sought to determine which of the independent variables impact reading acquisition. There are four independent variables—that is, factors that may be influencing the outcome: program participation, gender, ethnicity, and SES. The researcher examined how each independent variable impacted the dependent variables. Table 4 illustrates the matrix for the variables used in this study.

Table 4
Variables Used in the Study

Variable	Level of Measurement	Status in the Analysis
DRAII score	Levels 1–20	Dependent variable
PARCC LA	Scores 650–850	Dependent variable
Gender	0 = male, 1 = female	Independent variable
Program participation	0 = LLI, 1 = No LLI	Independent variable
SES	0 = low 1 = high	Independent variable
Ethnicity	1–White/Asian, 2–Black, 3–Hispanic	Independent variable

Data Analysis

First, the researcher analyzed the data to address the following questions in the study:

To what extent did the first-grade students who participated in the LLI program show significant growth compared to the students who did not participate in the LLI program?

How did gender, SES, and ethnicity moderate the effects of LLI on students' academic performance?

The researcher began by conducting a baseline equivalency test to ensure that there were no differences between the treatment and control groups. Chi-square tests were used to measure the equivalence of gender, SES, and ethnicity to ensure that the LLI group and the control group were comparable. The chi-square test of goodness of fit uses frequency counts from a sample—in this case, the students who participated in the LLI intervention group—with frequency counts from the population—that is, those who did not participate.

Next, the researcher calculated Pearson's correlation coefficient to determine whether there was a correlation between students receiving LLI versus those who did not and their performance on the PARCC LA. Correlation tells us with two details about the relationship: the direction, which is positive or negative, and the strength, which is measured from -1 to 1. Correlations do not determine cause and effect—only relationship and direction (Creighton, 2007). Correlation can be a useful tool, but it tells us nothing about the predictive power of variables. Determining what kinds of predictions we can make from the relationships provides the data necessary to make

informed decisions about programming and instruction to improve student achievement (Creighton, 2007). Analysis of covariance (ANCOVA) should be conducted if the correlation is statistically significant. If there is no strong correlation, it would not be sensible to make predictions on the outcome of one variable based on the effect of the other (Creighton, 2007).

In the first one-way ANOVA model, the dependent variable was the DRAII scores, and the independent variable was program participation. The fall DRAII scores were the covariate. To answer subsections a, b, and c for question one, a series of two-way ANCOVAs was conducted. The independent variables were gender, SES, and ethnicity. Dummy codes were used for students' participation (0 = LLI, 1 = No LLI). Gender was recoded 0 for males and 1 for females, and SES was coded 0 for low SES and 2 for high SES. Ethnicity was coded to include Hispanic = 1, Black = 2, White or Asian = 3. This permitted the examination of the effects and the interactions of two independent variables (Creighton, 2007). Two-way ANCOVAs were used to determine whether there was a statistically significant effect on any of the group means tested. If there was a significant difference detected, a post hoc test was conducted to confirm where those differences occurred.

To answer the second question—Was there a significant difference in performance on the Grade 3 PARCC LA assessment between students who received LLI in the first grade and those who did not?—a one-way ANCOVA was conducted. This determined whether significant differences occurred between the dependent variable—third-grade PARCC LA scores—and the independent variable—program groups—while controlling for the covariate—spring DRAII scores.

This one-way ANCOVA allowed us to examine the effects and the interactions of the independent variables—students participating in LLI and students who did not participate in LLI—on the PARCC LA. The covariate was fall DRAII. It tested for the mean differences of both groups. The null hypothesis for this question was as follows: In regard to performance on the third-grade PARCC LA, there is no significant difference between those who participated in LLI and those who did not participate in LLI.

CHAPTER IV

DATA ANALYSIS

Background

The purpose of this study was to examine the influence of LLI on students' reading achievement in Grade 1 and to determine whether growth was sustained through Grade 3. The researcher hopes that the study results will contribute to the literature to assist school-based administrators in making informed decisions when selecting reading intervention programs that significantly impact students' reading achievement. The aim was to understand whether there was a significant difference in effect on the reading achievement of a group of first-grade students who received the LLI intervention and students of similar abilities who did not. The goal was also to determine the effect of the independent variables—DRAII level, gender, ethnicity, and SES—on reading achievement. The research sought to determine whether participation in the LLI intervention program significantly impacted students' performance on the PARCC LA assessment at the conclusion of Grade 3.

A quantitative research method was used to gather and analyze the data. The use of quantitative research eliminates bias and removes opinions and perceptions from the data collection process. The cohort of students in this study was selected because they were the first cohort in the district that used LLI and the first cohort tested using the third-grade PARCC LA assessment. The LLI intervention group was selected from the original pool of data, which comprised a total of 348 students in Grade 1. A total of 65 complete student records of participants in the LLI intervention were selected. Next, the control group was selected from the remaining student data in the file. The data set was

stratified based on gender, ethnicity, SES, special education, and DRAII level. From the stratified data set, a control group was selected. A total of 131 participants were selected for the study: 66 participants in the control group and 65 in the treatment group. The control group included all the students who did not receive the LLI intervention. Fourteen students in the control group received an alternative intervention, which was a program created within one of the elementary schools, with a focus on multisensory reading instruction; this group was identified as the OG in the study. The remaining 52 participants did not receive an intervention outside of tier-one instruction. The following research questions guided this analysis:

1. To what extent did the first-grade students who participated in the LLI program show significant growth compared to students who did not participate in the LLI program?

- a. How does gender moderate the effects of LLI on students' academic performance?
- c. How does SES moderate the effects of LLI on students' academic performance?
- c. How does ethnicity moderate the effects of LLI on students' academic performance?

2. In determining the sustaining effects, the following research question was posed: Was there a significant difference in the performance on the third-grade PARCC LA assessment between students who received the LLI intervention in the first grade and those who did not receive LLI?

Presentation of Research Findings

The research conducted for this study is derived from a diverse pre-K to Grade 12 school district in Central New Jersey. Prior to performing analysis pertinent to the research questions, chi-square tests were conducted to determine whether the groups were comparable with regard to gender, ethnicity, SES, and special education. The purpose of these baseline equivalency tests was to certify that the treatment group and the comparison groups were similar prior to analyzing the results. Differences in the covariates that were statistically significant were revealed in the analysis.

Table 5 presents the frequencies for the total population of students included in the study. The data in this study, as described in Table 1, revealed that males were represented slightly more than females, with 53% males and 47% females in the data set. It is also evident that the majority of the participants in the study were Hispanic students, who represented 45% of the entire population. White and Asian students made up 34%, while Black students were the smallest population at 20%. The economically disadvantaged students exceeded the number of students who were not economically disadvantaged by 7%; therefore, the distribution of the socioeconomic groups was relatively balanced. Finally, the students who were classified as special education accounted for a fraction of the population—17% compared to 83% of students who were not classified as special education. In sum, our students were approximately half female and half male and represented a variety of cultural backgrounds. They also offered diversity in regard to SES and contained a minimal representation of special education students.

Table 5
Frequency Tables

Description	Frequency	Percent
Gender		
Male	69	53%
Female	62	47%
Ethnicity		
Hispanic	59	45%
White/Asian	45	34%
Black	27	20%
Economically Disadvantaged		
No	57	44%
Yes	74	56%
Special Education		
No	109	83%
Yes	22	17%

Chi-square analyses were conducted to determine whether the treatment and control groups shared similar characteristics. The treatment group included students who were in the LLI intervention program and were categorized as LLI. The participants in the control group who did not receive any LLI were categorized as No LLI. The chi-square goodness-of-fit test measured the discrepancy between the observed sample frequencies and the expected frequencies, as identified in the null hypothesis. This baseline equivalency test was conducted for two separate data sets. When establishing the groups, the No LLI group included students who received another intervention to address their reading deficiencies (OG) and students who received no intervention at all. Therefore, to determine whether this subset of students in the No LLI group was not significantly different from the students who received no intervention at all, two data sets were formed. The first compared the LLI group to the No LLI group; the second data set included three groups: the OG group, the No LLI group, and the LLI group. This equivalency test measured how all the groups compared, using the initial DRAII as a

pretest administered in the fall of the participants' first-grade year. The DRAII acted as the baseline for the analysis; the means needed to be relatively equal for all the comparison groups. The analysis was conducted, and it was found that while the OG group composition was similar to those of the other two groups, it failed the equality of means test using the ANOVA, and therefore, further analysis of the OG group was included in the No LLI group.

The chi-square tests and cross-tabulation for program participation and gender is shown in Table 6 below. The results indicated that no significant relationship was found between gender and participation group when determining differences in students' performance: $X^2(1, N = 131) = .007, p = .934$. These results indicated that the covariate of gender was not statistically different between the treatment group and the control group. The treatment and control groups in both tests were comparable with regard to gender.

Table 6
Cross-Tabulation Between Gender and Program Participation

Description	No LLI		LLI		
	N	%	N	%	
Male	35	53%	34	52%	
Female	31	47%	31	48%	
Chi-square Test	Value	Df			Asymptotic significance (2 sided)
Pearson	.007	1			.934
N of valid cases	131				

The next chi-square test displayed in Table 7 represents a cross-tabulation of program participation status and ethnicity. The results indicated that no significant relationship was found between ethnicity and program participation status and students'

performance: $\chi^2(2, N = 131) = 1.364, p = .506$. Therefore, covariate ethnicity was not statistically different between the treatment and control groups. The treatment and control groups were comparable with regard to ethnicity.

Table 7
Cross-Tabulation between Ethnicity and Program

Description	No Program		LLI		
	N	%	N	%	
Hispanic	27	46%	32	54%	
Black	16	59%	11	41%	
White/Asian	23	51%	22	49%	
Chi-square test	Value	Df			Asymptotic significance (2 sided)
Pearson	1.364	2			.506
N of valid cases	131				

The treatment and control groups were comparable with regard to SES. Table 8 shows the results of the cross-tabulation between SES and program participation status. The chi-square test results were $\chi^2(1, N = 131) = .204, p = .651$. The findings indicated that the covariate SES was not significantly different between the treatment and control groups.

Table 8
Cross-Tabulation between SES and Program

Description	No Program		LLI		
	N	%	N	%	
No	30	46%	27	42%	
Yes	36	54%	38	58%	
Chi-square test	Value	Df			Asymptotic significance (2 sided)
Pearson	.204	1			.651
N of valid cases	131				

Table 9 shows the chi-square test tabulations of special education classification and program participation. The results indicate that no significant differences in student performance existed between special education and program participation: $X^2(1, N = 131) = .257, p = .612$.

Table 9
Cross-Tabulation between Special Education and Program

Description	No LLI		LLI		
	N	%	N	%	
No	56	85%	53	82%	
Yes	10	15%	12	18%	
Chi-square test	Value	Df			Asymptotic significance (2 sided)
Pearson	.257	1			.612
N of valid cases	131				

A one-way ANOVA was conducted to examine the variability amongst the means in the initial DRAII scores of the groups being compared in the study. As shown in Table 10, the descriptive statistics associated with the fall DRAII scores and program participation status indicated that the LLI group had the numerically lowest mean level ($M = 2.66$) and that the No LLI group was associated with the numerically highest mean ($M = 2.74$). The assumption of homogeneity of variances was met: $F(1,129) = 2.009, p = .159$. The results of this one-way ANOVA indicated no significant difference between the means of the LLI group and the No LLI group's performance on the fall DRAII— $F(1,130) = .240, p = .625$; the groups were comparable with regard to their means.

Table 10
ANOVA, Fall DRAII

Description	N	M	SE	SD
No LLI	66	2.74	.111	.900
LLI	65	2.66	.123	.989
	Df	F		Sig.
Between groups	1	.240		.625
	130			

Descriptive Statistics for DRAII and PARCC

Pearson’s product–moment correlation coefficient was computed to assess the relationship between students’ performance on the fall and spring DRAII in the first grade—that is, the two primary measures of academic performance. There was a positive correlation between these two variables: $r = .432$, $N = 131$, $p < .001$. Overall, there was a moderate correlation between the performances on the reading assessments. Increases in the spring DRAII were correlated with increases in the fall DRAII scores.

Another Pearson’s product–moment correlation coefficient was computed to assess the relationship between students’ performance on the spring DRAII in the first grade and their performance in the third-grade PARCC LA assessment. There was also a positive correlation between these two variables: $r = .611$, $N = 131$, $p < .001$. Overall, there was a moderately strong correlation between the students’ performance on the spring DRAII and the third-grade PARCC LA assessment. Increases in the third-grade PARCC LA were correlated with increases in the spring DRAII first-grade assessment.

The students included in this study represented those performing below grade-level expectations on the initial DRAII Grade 1 fall assessment. The DRAII grade-level

expectation for the fall of first grade was level four. Table 8 illustrates the No LLI group (N =66), M = 2.7, and the LLI group (N=65), also at M = 2.7. Reported separately, the No LLI multisensory group (OG) had the lowest, M= 2.1, while the No Program group (N= 52) had the highest numerical mean, M = 2.9. The grade-level expectation on the DRAII at the end of the first grade was level 16. The reported means at the end of Grade 1 on the DRAII were as follows: the LLI group M = 12.3 and the No LLI group M = 13.5. When reported separately, the No Program group was M = 15 and the OG group was M = 7.7.

The students' performance on the PARCC LA assessment was reported using a scale score and a performance level of one to five. The scale score summarizes student performance on the LA portion of the test and includes a reading and writing score. Scale scores range from 650 to 850 on all assessments (PARCC, 2016). The students receiving a score in the range of 750 to 850 (levels 4 and 5) have either met or exceeded grade-level expectations. These levels demonstrate students' readiness for the next grade level. Students receiving a score of 725 to 749 (level 3) are approaching grade-level expectations, and those with scores below 725 (levels 1 and 2) are performing below grade-level expectations.

As shown in Table 11, the mean for the Grade 3 PARCC LA of the LLI group (N = 65) was M = 718. When the No LLI group was separated with the OG and No Program groups reported, the mean of the No Program group (N = 52) was M =738, and the OG group (N = 14) was M = 700. When combined, the mean of the No LLI group (N = 66) was M = 730. The sample size in any empirical study is important when making inferences about the population. The OG group sample by itself is too

insignificant to be analyzed separately; therefore, all further analysis in this study will include two participation groups: the LLI group (treatment group, N = 65) and the No LLI group (control group, N = 66).

Table 11
Group Means by Program and Assessment

Program	N	DRAII Fall Gr1	DRAII Spr. Gr1	PARCC LA Gr. 3
LLI	65	2.7	12.3	718
No LLI	66	2.7	13.5	730
No Program	52	2.9	15	738
OG	14	2.1	7.7	700

Analysis of Research Questions

In this section, the findings are presented for each research question.

Research Question 1: To what extent did the first-grade students who participated in the LLI program show significant growth compared to the students who did not participate in the LLI program?

The students were classified into two groups according to the intervention program in which they were enrolled. For this analysis, a one-way ANCOVA was conducted. The dependent variable was the spring DRAII assessment. The null hypothesis was the following: Program participation has no significant effect on students' performance on the spring DRAII assessment when controlling for the pretest scores.

The results shown in Table 12 compare the LLI participants to the students in the study who did not receive LLI. The aim of this comparison was to determine whether

group participation had a significant effect on the students' reading performance on the spring DRAII. The assumption of homogeneity of variance was met: $F(1,129) = .705$, $p = .403$. The covariate fall DRAII was significant: $F(1,130) = 29.1$, $p < .001$, $r = .90$, $\eta^2 = .19$. The performance on the spring DRAII did not differ substantially between the LLI students and the control group: $F(1,130) = 1.67$, $p = .199$, $\eta^2 = .013$.

Table 12
ANCOVA for Spring DRAII

Program Participation	M	SE	N		
No LLI	13.4	.537	66		
LLI	12.4	.541	65		
	Df	F	Sig.	Partial Eta	
Fall DRAII	1,130	29.1	<.001	.19	
Program Participation	1,130	1.67	.199	.013	

Note: The covariates in this model are evaluated at the following values: fall DRAII (GR2) = 2.70

As a follow-up, Table 13 illustrates a cross-tabulation displaying the growth of students from the fall to spring in their first-grade year. Both groups showed gains; however, the No LLI group (N =66) showed the greatest improvement in student performance, with an increase of 31%, resulting in a total of 31 students attaining grade-level proficiency or higher on the first-grade spring DRAII assessment. The LLI group (N = 65) showed an increase of 25%, with 15 additional students, bringing the total to 23 students to or above grade-level proficiency by the end of the first grade.

Table 13
Grade 1 Student Grade-Level Performance

Level	LLI			No Program		
	Fall N / %	Spring N / %	% change	Fall N/%	Spring N/%	% change
Below	57 / 88%	42 / 65%		55 / 83%	35 / 53%	
On or above	8 / 12%	23 / 35%	+25%	11 / 17%	31 / 47%	+31%
Total	N=65			N=66		

Sub-question 1a: How does gender moderate the effects of LLI on students' academic performance?

Participation in a reading intervention program may contribute to student achievement; however, this effect might differ, depending on gender. A two-way ANCOVA was conducted to test the interaction effect of gender and program participation on students' performance on the spring DRAII assessment at the end of the first grade. The null hypothesis was that gender does not moderate the effects of program status on performance. Table 14 shows the effect of gender and program participation on the students' reading performance on the spring DRAII. The assumption of homogeneity of variance was met: $F(3,127) = .380, p = .768$. The two-way ANCOVA (between-subjects factors: gender [male, female]; program participation [LLI, No LLI] and covariate: fall DRAII) revealed no significant impact of gender— $F(1, 130) = .003, p = .960, \eta p^2 < .001$ —nor program participation— $F(1, 130) = 1.861, p = .175, \eta p^2 = .015$ —and the interaction between gender and program on academic performance was $F(1, 732) = 1.1777, p = .185, \eta p^2 = .014$.

Table 14
Two-Way ANCOVA for Gender and Program

Program Participation	Male			Female		
	M	SE	N	M	SE	N
No LLI	12.90	.738	35	13.96	.787	31
LLI	12.87	.748	34	11.87	.784	31
	df	F		Sig.		Partial Eta
Gender	1, 130	.003		.960		<.001
Program Part.	1, 130	1.861		.175		.015
Gender & Program Part.	1, 130	1.177		.185		.014

Note: The covariates in this model are evaluated at the following values: fall DRAII (GR1) = 2.70

Sub-question 1b: How does SES moderate the effects of LLI on students' academic performance?

Students' SES may influence their performance in school and may, thus, have an effect on their performance on the DRAII assessment. To determine the effect of SES on students' end-of-year reading assessment, a two-way ANCOVA was conducted. The null hypothesis is that SES has no significant moderating effect on students' performance. Table 15 presents the effect of SES as a moderator and program participation on students' performance on the spring DRAII. The assumption of homogeneity of variance was met: $F(3,127) = .743, p = .528$. A two-way ANCOVA with fall DRAII as the covariate and SES (low, high) and program participation (LLI, No LLI) as between-subjects factors revealed a significant main effect of SES— $F(1,130) = 9.996, p = .002, \eta^2 = .074$ —which means that 7% of the variance in spring DRAII scores were attributed to SES. However, program participation had no significant effect:

$F(1, 130) = 1.326, p = .252, \eta p^2 = .010$. The interaction effect between the two main effects was not significant: $F(1, 130) = .086, p = .770, \eta p^2 = .001$.

Table 15
Two-Way ANCOVA for SES and Program

Program Participation	High SES			Low SES		
	M	SE	N	M	SE	N
No LLI	14.56	.773	36	12.42	.707	30
LLI	13.92	.814	38	11.34	.686	27
	Df	F		Sig.		Partial Eta
SES	1, 130	9.996		.002		.074
Program Part.	1, 130	1.326		.252		.010
*Interaction SES & Program	1, 130	.086		.770		.001

Note: The covariates in this model are evaluated at the following values: fall DRAII (GR1) = 2.70

Sub-question 1c: How does ethnicity moderate the effects of LLI on students' academic performance?

A two-way ANCOVA was conducted to analyze the effect of ethnicity and participation on the spring DRAII when controlling for the fall DRAII. Table 16 presents the results of this analysis. The assumption of homogeneity of variance was met: $F(5,125) = 1.394, p = .231$. The results revealed that ethnicity alone had a significant effect on students' performance on the spring DRAII when controlling for pretest fall DRAII scores: $F(2,130) = 5.107, p = .007, \eta p^2 = .08$. The results indicated that 8% of the variance in the spring DRAII scores was explained by ethnicity. The Post hoc analyses using the Bonferroni correction, an adjustment made to the P values when several dependent or independent tests are being conducted simultaneously on a single data set, revealed significant differences in performance between the Hispanic group on the spring DRAII ($M = 12.12$) and the White/Asian group ($M = 14.6$), $p = .010, SE =$

.830. The interaction between ethnicity and program participation revealed no statistically significant effect: $F(2,130) = 1.834$, $p = .164$, $\eta p^2 = .029$.

Table 16
Two-Way ANCOVA for Ethnicity and Program

Program Participation	Hispanic			Black			White/Asian		
	M	SE	N	M	SE	N	M	SE	N
No LLI	13.15	.810	24	11.29	1.046	9	15.16	.873	19
LLI	11.08	.743	32	13.01	1.26	11	14.04	.892	22
Total			56			20			41
	Df	F			Sig.			Partial Eta	
Program Part.	1, 130	.394			.531			.003	
Ethnicity	2, 130	5.107			.007			.076	
Progr * Ethni.	2, 130	1.834			.164			.029	

Note: The covariates in this model are evaluated at the following values: fall DRAII (GR1) = 2.70

Research Question 2: Was there a significant difference in the performance on the third-grade PARCC LA between students who received the LLI intervention in the first grade and those who did not?

The aim of this comparison was to determine whether group participation affects students' reading progress on the PARCC LA in the third grade. A one-way ANCOVA was conducted to determine whether there were statistically significant differences between the program groups on the third-grade PARCC LA assessment. The assumption of homogeneity of variance was met: $F(1,129) = .353$, $p = .553$. The covariate spring DRAII was significant: $F(1,130) = 75.536$, $p < .001$, $r^2 = .371$, $\eta p^2 = .365$. However, the performance on the Grade 3 PARCC LA did not differ significantly between the LLI students and the control group when controlling for spring DRAII: $F(1,130) = 1.562$, $p = .214$, $\eta p^2 = .012$. Table 17 depicts the findings of this one-way ANCOVA.

Table 17
 ANCOVA for PARCC LA Grade 3

Program Participation	M	SE	N		
No LLI	727	3.657	66		
LLI	720	3.662	65		
	Df	F	Sig	Partial Eta	
DRAll Spring	1, 130	75.536	<.001	.365	
Program Participation	1, 130	1.562	.214	.012	

Note: The covariates in this model are evaluated at the following values: spring DRAll (GR1) = 12.91

To further explore whether there were differences two years after the intervention period, additional two-way ANCOVAs were conducted using spring DRAll as a covariate and the third-grade PARCC LA as the post assessment.

The first two-way ANCOVA was conducted to analyze the effect of ethnicity and participation groups' performance on the third-grade PARCC LA when controlling for the spring DRAll. Table 18 illustrates the results of this analysis. The assumption of homogeneity of variance was met: $F(5,125) = 1.316, p = .261$. The results revealed that ethnicity had no significant effect on students' performance when controlling for pretest spring DRAll scores: $F(2,130) = 2.473, p = .088, \eta^2 = .088$. In addition, there was no significant interaction effect between ethnicity and program participation: $F(2,130) = .23, p = .978, \eta^2 = .000$.

Table 18

Two-Way ANCOVA Grade 3 PARCCLA for Ethnicity and Program

Program Participation	Hispanic			Black			White/Asian		
	M	SE	N	M	SE	N	M	SE	N
No LLI	721.36	5.7	27	727.06	7.4	16	734.16	6.2	23
LLI	715.09	5.4	32	718.7	8.9	11	728.91	6.3	22
	Df	F			Sig.			Partial Eta	
Program Part.	1, 130	1.460			.229			.012	
Ethnicity	2, 130	2.473			.088			.038	
Progr * Ethni	2, 130	.23			.978			.000	

Note: The covariates in this model are evaluated at the following values: spring DRAII (GR1) = 12.91

The second two-way ANCOVA was conducted to analyze the effect of SES and participation group's performance on the Grade 3 PARCC LA when controlling for the spring DRAII. Table 19 presents the results of this analysis. The assumption of homogeneity of variance was met: $F(3,127) = .532, p = .661$. The results reveal that SES had no significant effect on students' performance when controlling for pretest spring DRAII scores: $F(1,130) = 3.648, p = .058, \eta^2 = .028$. In addition, there was no significant interaction effect between SES and program participation: $F(1,130) = .280, p = .598, \eta^2 = .002$.

Table 19

Two-Way ANCOVA Grade 3 PARCC LA for SES and Program

Program Participation	High SES			Low SES			
	M	SE	N	M	SE	N	
No LLI	723.82	4.9	36	731.24	5.4	30	
LLI	715.01	4.9	38	727.93	5.7	27	
	Df	F			Sig.		Partial Eta
SES	1, 130	3.648			.058		.028
Program Part.	1, 130	1.346			.248		.011
SES * Program Participation	1, 130	.280			.598		.002

Note: The covariates in this model are evaluated at the following values: spring DRAII (GR1) = 12.91

Summary of Results

This study followed a causal-comparative design to determine the causes or consequences of student's program participation and their DRAII scores, and subsequently PARCC LA scores. It also sought to determine whether the covariates gender, ethnicity, and SES moderated the effects of the LLI intervention on student achievement. There were a total of 131 students selected for the study: 66 in the control group and 65 in the treatment group. Chi-square tests were conducted and revealed that no significant differences in covariates (gender, SES, and ethnicity) existed between the LLI group and the No LLI group. Both the No LLI and LLI groups were comparable. Initially, a group of 14 students who received a multisensory intervention (the OG group) was considered a separate cluster; however, it failed the equality of means test using the ANOVA and could not be analyzed separately. Instead, this cluster of 14 students were included in this study as part of the No LLI group.

The main aim of the study was to determine whether student participation in the LLI intervention had a significant effect on students reading performance and if so, whether the progress was sustained over three years. To assess the effect of the LLI intervention during the first year of implementation, a one-way ANCOVA was conducted. The results of this analysis indicated that student participation in the LLI intervention yielded no significant effect on their reading performance.

Next, a series of two-way ANCOVAs was conducted to determine the effects of the covariates (gender, SES, and ethnicity) and students' group participation on DRAII performance. The results showed that the interaction of the covariates gender and SES with group participation had no significant interaction effect on students' reading

performance on the spring DRAII. The covariate ethnicity, however, showed a significant effect on the performance of the Hispanic and White/Asian students on the first-grade spring DRAII assessment, with 11% of the variance in student performance explained by ethnicity and group participation. The students in the White/Asian group performed significantly better than their Hispanic counterparts on the spring DRAII when controlling for fall DRAII scores.

The last research question focused on the sustained growth of students in both the LLI and No LLI groups, as measured by the cohorts' third-grade PARCC LA assessment. The students' group participation was not shown to have a significant effect on their performance on the third-grade PARCC LA assessment ($p = .051$). Given that the study findings did not present significant effects of group participation in LLI, further analyses were conducted to explore the growth within the cohort. The cross-tabulation results revealed that students remaining in the classroom who did not receive the tier-two LLI intervention showed the greatest growth during the implementation year, with 20 additional students moving to grade-level proficiency by end of year, resulting in a total of 31 students being at or above grade level. The LLI group showed an increase of 15 students, resulting in a total of 23 students achieving grade-level proficiency or better by year end.

The results of these analyses indicate that the LLI intervention program did not significantly impact reading achievement in its implementation year. A discussion of the implications of the study findings, including an evaluation of each hypothesis, the study conclusions, and recommendations, is provided in Chapter 5.

CHAPTER V

SUMMARY AND RECOMMENDATIONS

Chapter 5 discusses the implications of the study's findings. The chapter includes an overview of the study, as well as insights derived from the findings. It concludes with recommendations for school and district administrators and literacy practitioners, as well as recommendations for future studies.

Overview

Public school districts are continuously seeking ways to close the growing achievement gap in literacy that begins as early as prekindergarten. Stakeholders across the nation search for effective and rigorous systems to meet the diverse needs of their learners. To promote and support these efforts, Congress continues to enact laws intended to hold public education systems, administrators, and educators accountable for student achievement (ESEA, 2011; ESSA, 2015; NCLB, 2001).

The LLI system is a reading intervention system that is designed to work within tier two of the RTI framework to improve literacy skills (Howard, 2009). The LLI program is being implemented in numerous districts throughout the country. The goal of the LLI program is to accelerate students' reading growth, moving them closer to attaining grade-level proficiency within an average 18- to 20-week timeframe (Fountas & Pinnell, 2013).

As a result of the demands of changing demographics and the growing achievement gap, the Central New Jersey public school district represented in this study implemented the LLI program to improve student reading achievement. The study

examined the effect of LLI on first-grade students' reading progress during the district's first year of implementation. The reading development of this cohort of students was analyzed again at the end of the third grade. The study also sought to clarify how the variables—gender, ethnicity, and SES—accounted for differences in the students' reading progression. The students' reading proficiency was measured by the DRAII and the PARCC LA results in Grade 3. The DRAII was administered to students individually by their classroom or academic support teacher. The DRAII independent reading level—which reflects a score of 90% or above in accuracy, fluency, and comprehension—was recorded (Pearson, 2009).

As discussed in Chapter 2, the LLI system is designed to address the reading deficits of struggling readers. The intervention provides direct instruction daily for 30 or 45-minutes per lesson depending on level, 5 days a week, as a supplement to tier-one instruction. When implemented with fidelity, LLI is proposed to boost students' reading levels at an accelerated rate. Students are expected to be at or close to grade-level proficiency when they exit the program after 18 to 20 weeks of explicit, direct instruction (Fountas & Pinnell, 2013). As a program that is noted to improve reading achievement, it is central to evaluate its effectiveness. Some research has shown LLI to have positive effects on students' reading achievement; however, more research is needed to determine its long-term effects on students' performance.

This study was conducted to evaluate the effectiveness of the LLI program on students' text-level growth and the longitudinal progression of students who have been in the LLI program and those who have not. The following questions were examined:

1. To what extent did the first-grade students who participated in the LLI program show significant growth compared to the students who did not participate in the LLI program?
 - a. How does gender moderate the effects of LLI on students' academic performance?
 - b. How does SES moderate the effects of LLI on students' academic performance?
 - c. How does ethnicity moderate the effects of LLI on students' academic performance?

As indicated in Chapter 3, the first research question sought to determine whether the LLI program had a significant effect on the reading progress of students with the intervention when compared to students without LLI in their first-grade year. The LLI program did not yield significant effects on reading progress. The findings were not consistent with other research regarding the effects of the LLI program in the early years of a student's education (Ransford-Kaldon et al., 2010).

The findings also indicate that gender was not a significant moderator of the effects of the LLI program on student achievement, but SES was. However, while SES had a significant effect on students' performance, the interaction between SES and program participation did not have a significant effect on the post-spring DRAII assessment. The overall impact of SES indicates that the higher-SES students outperformed the lower-SES students overall. My findings are congruent with those that show that economically disadvantaged students have increased risks of failing the state-mandated standardized achievement tests (Cooper & Crosnoe, 2007).

Additionally, the White and Asian students performed better than the Black and Hispanic students in both groups.

2. When determining the sustaining effects, the following research question was posed: Was there a significant difference in the performance on the third-grade PARCC LA assessment between students who received the LLI intervention in the first grade and those who did not?

The results of this ANCOVA showed that program participation had no significant effect on the groups' Grade 3 PARCC LA scores. Due to significant findings regarding both ethnicity and SES status in research question one, further analysis was conducted for research question two. The results indicated that neither SES status nor ethnicity had any significant effect on the Grade 3 PARCC LA scores.

Conclusions and Recommendations

Research shows that intervening early improves the long-term achievement of at-risk students. Furthermore, students entering kindergarten with basic foundational literacy skills—such as alphabetic knowledge, phonemic awareness, rich vocabularies, strong concepts of print, and a desire to learn—are predicted to become successful learners (Given, 2002). Conversely, students entering school with limited foundational literacy skills struggle to keep pace with their peers. To produce the greatest results, effective interventions for literacy must supplement scientifically research-based tier-one instruction. Teachers armed with a notable understanding of literacy instruction will be better prepared to meet the challenging demands of the most at-risk students. Placing qualified literacy teachers in kindergarten and the first grade will help to provide the

comprehensive foundational literacy instruction that is required early to prepare students for success in later years. Well-trained support teachers and coaches with a strong instructional literacy background can assist in narrowing the achievement gap by developing coaching relationships with classroom teachers, thereby providing the professional development in literacy instruction teachers need and the coordinated support system that our early at-risk learners require. Investment in the development of literacy experts can also serve as a vital resource for teachers' ongoing professional development. This process will facilitate a continuous study of teaching and learning while providing support and professional development to classroom teachers.

Assembling quality primary instructors through the hiring of highly qualified literacy experts, as well as creating meaningful ongoing professional development plans for teachers and administrators to support continued learning, have been proven effective at accelerating student achievement (Allington, 2011). In addition, minimizing the impact of factors that present barriers to improving reading achievement in schools—such as programs that are implemented with minimal fidelity, integrity, and lack of quality oversight; programs that are not sustained long enough to see results; and too many isolated attempts to correct the reading deficits rather than implementing coordinated and comprehensive research based systems—can result in improved student achievement (Fountas & Pinnell, 2009). The results of this study show that both groups noted reading gains, with a percentage of students attaining grade-level proficiency. Additional qualitative research is needed, specifically during the LLI implementation period to measure the impact of teacher efficacy and fidelity to the model, as well as the impact of student attendance, and to determine the effects of the

program when interventionists receive ongoing professional development. A benefit noted in other research was the protection of the reading block from interruptions (Harrington et al., 2001). Protecting the reading block would allow the scheduling of supplemental interventions to be held outside of tier-one instruction, thus affording all students receiving LLI opportunities to participate in schools' core curriculum tier-one instruction.

There is no single intervention that will meet the diverse needs of all at-risk students. Identifying appropriate interventions is essential to improving achievement. The results of this study support the findings of the research outlined in Chapter 2, indicating that students will demonstrate difficulty in attaining grade-level proficiency when starting first grade as poor readers. When students enter school with poor decoding skills coupled with poor listening comprehension skills, it is likely that they will remain poor readers as they progress through school (Harvey, 2001). Studies show that the LLI system has proven to be effective when other evidence-based instructional practices are in place to meet the diverse needs of all at-risk learners in the classroom. Therefore, it is important to identify students for early intervention through universal screenings, deliver interventions based on their needs, and monitor their progress continuously. Through this process, the use of fidelity measures to ensure interventions are delivered as intended is integral to the success of any supplemental literacy program.

Students come to school with distinctive academic needs, as well as unique background experiences, interests, cultures, languages, and attitudes toward learning. Effective teachers recognize that all factors impact students' learning. They adjust or

differentiate their instruction continuously to meet students' needs. The results of this study show significant differences in the achievement of Hispanic students and the White and Asian student group, and the differences are greatest with Hispanic students participating in LLI. Hispanic students entering school with limited English proficiency and coming from households in which limited English is spoken present added obstacles in regard to acquiring a new language. Teachers with little knowledge of ELL instructional strategies often lack the expertise required to meet their needs. Professional development opportunities for ELL teachers and general education instructors, along with a viable ELL curriculum, have to be in place to meet these demands.

The researcher determined that the LLI intervention program did not have significant effects on students' reading. LLI teachers are provided with the scripted program; however, professional development for full implementation with fidelity is key to the program's success. LLI's broad base allows for students' acceleration across reading, writing, and phonics. When the program's research-based instructional actions are implemented with fidelity, students demonstrate accelerated growth (Ransford-Kaldon, 2010). It is imperative that program oversight by building administration ensues, and to achieve the desired result, full implementation with fidelity to the model must occur. Progress monitoring throughout the intervention process should provide data to assist administrators in determining whether the LLI system is an appropriate choice for the school or district.

In addition to LLI, teachers' reflective practices, ongoing professional development, and continued focus on teaching effective reading strategies are

necessary to optimize literacy achievement. It is strongly suggested that the pedagogical companion *When Readers Struggle* (Fountas & Pinnell, 2009) be used alongside LLI to help address the varied needs of all students in the classroom.

Progress monitoring with efficient data management aids in the implementation process. Due to the nature of this study, it could not be determined whether students in all schools were pulled out for the prescribed times or whether student attendance impacted performance results. Additional research in this area is needed to determine whether data protocols and progress monitoring impact the outcome of the treatment. Success in closing the achievement gap requires partnerships with teachers, parents, administrators, and the community. Literacy impacts everyone, starting in elementary school and continuing in high school, college, and the workplace. The school district's investment of time and resources to support early learning will have long-term effects on student achievement.

This quasi-experimental study examined a district launching LLI in its first year of implementation; however, the data were collected and analyzed more than three years ex post facto. Future research in this area should consider a true experimental study in which the researcher is able to gather data in real time—that is, as the intervention is occurring. A true experimental study would allow the researcher to better understand causal processes, in this case to consider the factors to which the greatest text-level gains can be attributed. Additional consideration should be given to the inclusion of a larger sample size in a larger district or several small districts.

The Hispanic group represented in this study revealed the lowest mean in text-level gains in both groups. Future studies should seek to determine whether the

instructor's proficiency with teaching ELLs impacts the students' text-level gains. In addition, research to determine the impact of non-ELL Hispanic students versus ELLs should be explored to delineate variables explaining differences in this group's performance. When ethnicity was analyzed as the cohort reached Grade 3, no significant difference was noted. Therefore, a mixed-methods longitudinal study of the progression of Hispanic students receiving the LLI treatment should add to the research to determine the efficacy of the program for students with language barriers. This study should include perceptions of teachers, students, and parents in relation to the treatment, in addition to text-level gains. Other studies may also seek to determine how ELLs progress in relation to their time in school and time in the country relative to their language proficiency levels.

Increased explicit instruction in reading can have a positive impact on students' reading achievement. The instructional practices that focus on the five pillars referenced in Chapter 2 have demonstrated potency when applied together with knowledge of students' learning styles and needs. Research shows that reading interventions are more effective when they are administered outside of the school day, such as prior to school starting or during after-school programs (Weiss, Little, Bouffard, & Malone, 2009). When students are pulled from reading instruction for intervention, they demonstrate limited text-level reading gains. This practice inhibits growth, further widening the achievement gap. The connotation that LLI is an effective intervention is generalizable and dependent on many variables, which can impact the sample population. Although studies show LLI to be a powerful reading intervention yielding

significant results (Ransford et al., 2010), my study demonstrated no significant reading gains for students receiving the intervention when compared to their peers.

A reexamination of the current study through the lens of lessons learned will benefit future researchers seeking to determine the efficacy of LLI's immediate and long-term impact on literacy. It is widely known and expressed in this literature review that the success of the implementation and oversight of programs designed to improve students' achievement is heavily dependent on cogent leadership practices. Studies designed with both pragmatic and theoretical considerations will further add to the research on effective reading practices. Guiding teachers through the process of improving the literacy of at-risk students should be informed by knowledge of effective reading practices, timely and efficient implementation with a devotion to protocol and progress monitoring, and the rigor necessary to move students at an accelerated pace.

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Appendices
Appendix A
IRB Approval Letter



June 14, 2017

Veronica Cole

Dear Ms. Cole,

The Seton Hall University Institutional Review Board has reviewed the information you have submitted addressing the concerns for your proposal entitled "The Influence of Participation in the Leveled Literacy Intervention Program on the Sustained Literacy Achievement for Students in Grades One Through Three." Your research protocol is hereby accepted as revised and is categorized as exempt.

Please note that, where applicable, subjects must sign and must be given a copy of the Seton Hall University current stamped Letter of Solicitation or Consent Form before the subjects' participation. All data, as well as the investigator's copies of the signed Consent Forms, must be retained by the principal investigator for a period of at least three years following the termination of the project.

Should you wish to make changes to the IRB approved procedures, the following materials must be submitted for IRB review and be approved by the IRB prior to being instituted:

- Description of proposed revisions;
- *If applicable*, any new or revised materials, such as recruitment fliers, letters to subjects, or consent documents; and
- *If applicable*, updated letters of approval from cooperating institutions and IRBs.

At the present time, there is no need for further action on your part with the IRB.

In harmony with federal regulations, none of the investigators or research staff involved in the study took part in the final decision.

Sincerely,

Mary F. Ruzicka, Ph.D.
Professor
Director, Institutional Review Board

cc: Dr. Elaine Walker

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