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Kindergarten Reading Readiness and Developmental Indicators for the Assessment of Learning

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Abstract

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by

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MA, St. Joseph College, 2006

BS, University of Maine at Fort Kent, 2002

Proposal Submitted in Partial Fulfillment

of the Requirements for the Degree of

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May 2019

Abstract

The acquisition of early childhood literacy skills is a predictor of academic success in elementary education. In a local school district, 22% of children entering kindergarten were assessed as having a gap in their reading readiness skills (RRS) based on their pre-K scores on the Developmental Indicators for the Assessment of Learning (DIAL-4). The average kindergarten beginning-year difference on the Reading Baseline Inventory (RBI) between the students with a gap and students without a gap was 15 out of 100 points. The purpose of this quantitative research was to examine the change between fall and spring RBI scores of kindergarten students who entered school with a gap and those who entered without a gap to determine if the gap was closed by the end of the school year. The framework for this study was Vygotsky's constructivist theory of how children construct knowledge based on their early experiences. From a census sample of 118 students, 26 students were classified as having a gap in their DIAL-4 readiness scores. Fall pretest and spring posttest RBI scores served as the dependent variable. Within group *t* tests revealed the group identified as having a reading readiness gap increased their average RBI reading performance by 47% while the group identified as not having a gap increased by 26%, $t(26) = -11.47$, $p < .001$. However, the between groups *t* test comparing the groups' RBI difference scores was also significant, $t(116) = -3.12$, $p = .002$, indicating a closed but still significant gap (6.8 points) remaining. A white paper presents the results of the study and will contribute to positive social change by providing school leaders with evidence based practical suggestions to better serve their students. By working to close the reading gap early it will help ensure students have a better chance to reach their full potential for academic success.

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Dedication

I dedicate this study to my husband, Branch, and my five children, Jeremiah, Rebecca, Abigail, Hannah and Naomi who have always encouraged me to pursue my dream of attaining my doctorate. I would also like to thank my parents and other family members for their never-ending support throughout this journey.

I hope that each of my children and grandchildren recognize the importance of education and my passion for lifelong learning and to always remember that if you work hard enough, your dreams really can come true.

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Section 1: The Problem

The Local Problem

School readiness and performance has been an ongoing national concern (Davoudzadeh, McTernan, & Grimm, 2015). In 1990, the National Educational Goals Panel (NEGP) established its first goal of having all children in America ready for school by the year 2000 (National Education Goals Panel, 1995). Members of the NEGP collected data to monitor the progress of meeting this goal. The results of this special report showed that the goal was far from being met at that time. Almost 20 years after the NEGP's initial goal, school leaders are still faced with the problem of students starting school without the necessary readiness skills (Child Trends Data Bank, 2015).

This readiness gap has caused educators to place a renewed emphasis on education in the primary grades as this time can set the foundation for all future learning (Drigas, Kokkalia, Economou, & Roussos, 2017). School readiness (when children are ready for kindergarten) can be described as a combination of the following skills: social skills, language, and literacy skills, ability to follow directions and engage, possess self-control, and exhibit common courtesy (Hustedt, Buell, Hallam, & Pinder, 2017; Samiei, Bush, Sell, & Imig, 2016). According to the Child Trends Data Bank (2015), the number of pre-K students demonstrating the early literacy skills of recognizing all letters, counting up to 20 or higher, writing their name and reading words in a book has increased from1993-2012 such that pre-K student's mastery of letter recognition increased from 21% to 38%, counting to 20 increased from 52% to 68%, and name writing increased from 50% to 58% during this time. However, even with this increase, the data showed that these students had not met the

NEGP's initial goal of all students being ready to start school by the year 2000 (Child Trends Data Bank, 2015).

The problem of school readiness impacts many local communities as they strive to meet state standards and ensure their children have the core skills to do well in school. This study was focused on a local school district with students consistently entering school without the necessary reading readiness skills to be academically successful in kindergarten. The local district's educators assess the level of school readiness through the use of the DIAL-4 (Mardell & Goldenberg, 2011). Local educators are finding that students are starting school without the necessary readiness skills based on the DIAL-4 taken prior to kindergarten. The DIAL-4 is a global screener that is used within the local community to assess children quickly and efficiently. The skills that the DIAL-4 measures include: (a) motor, (b) concepts, (c) language, (d) self-help, and (e) social-emotional skills. Each skill is measured as a separate subtest on the instrument. The subtest scores from the motor, concepts and language are the skills used to assess school readiness; therefore, these three skills were used for this study. These scores are used to determine if students are entering school with a gap or without a gap on school readiness skills.

In a local school district, 22% of children entering kindergarten were assessed as having a gap in their reading readiness skills based on their preschool readiness scores on the DIAL-4. The extent to which the gap was closed was not well understood and needed to be studied. As shown in Table 1, the percentage of students in this local school district with gaps in reading readiness skills increased from 2014 to 2017 by 13.2%.

Table 1

Students Entering Public Pre-K With Gaps in Reading Readiness Skills

School Year	Number of students	Number of students with delays (with gaps)	Percentage
2014-2015	73	12	16.4
2015-2016	83	17	20.5
2016-2017	118	26	22.0

Note: Adapted from public data provided by school administrators (December 12, 2017).

Early reading skills have been closely related to future reading performance, social, and civic life (Cerda, Im, & Hughes, 2014; Lennox, 2013; Preβler, Könen, Hasselhorn, & Krajewski, 2014). Students who do not meet grade-level standards have been found to be more likely to drop out of high school, have increased criminal activity, and other negative outcomes (Herman-Smith, 2012). Due to the foundational role reading skills play in a student's academic future, this study focussed on this specific readiness skill; however, by Grade 3, at least one in three students in the nation are struggling readers (Greenwood et al., 2015).

Because the goal of preschool is to prepare children for kindergarten, educational policies developed by stakeholders have focused on what the expectations should be in early elementary school programs (Pentimonti, Murphy, Justice, Logan, & Kaderavek, 2016; Tindal, Irvin, Nese, & Slater, 2015; Zhai, Waldfogel, & Brooks-Gunn, 2013). More than two-thirds of 4-year-old students attend some form of public or privately funded preschool in the United States (Mitchel & Mead, 2017).

Children have a variety of experiences before they enter kindergarten, and the diversity of these experiences often leads to students having varying skill levels. The students in this study have had a pre-K experience, however, the experiences may have been very different based on the type of pre-K they were enrolled in. Families in this local study have a variety of public and private options for pre-K programs.When pre-K students attend high-quality pre-K programs, it has been demonstrated to improve performance and readiness as students transition to kindergarten (Hustedt et al., 2017; Maine Children's Alliance, 2017; Maine Women's Policy Center, 2016; Poppe & Lipkowitz, 2015). The benefits of acquiring early school readiness skills last beyond the kindergarten school year according to research conducted by Butera and Martínez (2014). These researchers found that students who are academically ready early on are more likely to experience academic success throughout their lives. In the local setting, it was important to consider how to facilitate the academic success of all students, even those with a gap in their pre-K readiness skills.

All the students in this research study had attended pre-K, and the data collected differentiated students who entered school with a gap and those students who entered school without a gap. Students were categorized as having a gap or not having a gap in their reading readiness skills based on the DIAL-4 screening instrument that is completed prior to attending kindergarten in this school district. The importance of early detection and targeted interventions for students entering school without appropriate readiness skills has been documented. Research conducted by Goldstein, Eastwood, and Behuniak (2014), as well as Samiei et al. (2016) showed that when teachers identify struggling students at the start of the

school year and provide interventions that target the individual needs of these students, they can help close the gap in readiness skills.

Rationale

In a local school district, 22% of children entering kindergarten were assessed as having a gap in their reading readiness skills based on their preschool readiness scores on the DIAL-4. Educators in the local setting were very concerned with the increased numbers and whether or not these students were able to close the gap in their learning during kindergarten (School Administrators, personal communication, December 12, 2017).

Educators around the country are placing a renewed emphasis on education in the primary grades because early childhood education is the foundation for all future learning (Cooper, Moore, Powers, Cleveland, & Greenberg, 2014). Researchers' foci have shifted from experiential and play-based learning to a more academic model (Barnett, Votruba-Drzal, Dearing, & Carolan, 2017; Bassok, & Latham, 2017; Bassok, Latham, & Rorem, 2016). The criteria related to kindergarten readiness are based on the academic domains of vocabulary, mathematics and print awareness skills (Hustedt, Jung, Barnett, & Williams, 2015). Because school readiness predictors are the strongest predictors of student retention (Davoudzadeh et al., 2015), focusing on these skills during the early years can possibly help address academic issues for students.

There are approximately 4 million children enrolled in public kindergarten programs around the country and many of these children come to kindergarten with insufficient skills to succeed, and many students lack the readiness skills necessary for successful adjustment to school (Linder, Ramey, & Zambak, 2013; United States Department of Education, 2015).

Students who enter school with low readiness skills are not academically successful during their schooling (Gaynor, 2015; Greenwood et al., 2015). Poppe and Lipkowitz (2015) reported the following: "Starting school behind sends most children on a scholastic trajectory that limits their educational choices and affects their future academic and workforce success" (p. 15). The results of this research study may be used to assist teachers, administrators, and parents in making decisions that can address the academic needs of all students in order to address gaps in learning for students in pre-K and kindergarten. A variety of additional interventions to target the gaps could be implemented throughout the school year.

The purpose of this quantitative research study was to examine and compare the beginning- and end-of-year RBI scores of kindergarten students who entered school with a reading readiness gap and those who entered without a gap to determine whether the gap was closed by the end of their kindergarten school year. Students' inability to meet grade-level standards in the early years of education has been linked to the incompletion of high school, increased criminal activity, and other negative outcomes (Herman-Smith, 2012). Rabiner, Godwin, and Dodge (2016) found that students lacking early academic skills were less likely to graduate from high school.

To examine this issue, students were grouped into two categories, students who entered school with a gap and students who entered school without a gap in reading readiness skills based on the DIAL-4 assessment tool that was administered prior to the start of their kindergarten year. The RBI assessment is given at the beginning- and end-of-the kindergarten year providing the pre and posttest scores to be used for this study. I also

looked at the change scores to determine the growth of students who entered school with a gap in their reading readiness scores compared to those who did not enter with a gap. The following research questions addressed the reading readiness skills that were assessed at the beginning and the end of the kindergarten school year.

Definition of Terms

Alphabet knowledge: The knowledge of sounds and names that is associated with the 26 alphabetic letters (Lonigan & Shanahan, 2009).

Concepts of print: The knowledge of print conventions (e.g., left-right, front-back) and the concepts related to the parts of a book (Lonigan & Shanahan, 2009).

Constructivism: A theory based on the belief that learners construct meaning based on previous knowledge, beliefs, and experiences (Lambert et al., 2002).

DIAL-4: Developmental Indicators for the Assessment of Learning-A global screener for assessing large groups of children quickly and efficiently from age 2:6-5:11 at 2-month age intervals. Motor, concepts, language, self-help and social development are screened. For this study, I looked at the motor, concepts, and language (Mardell & Goldenberg, 2011).

Early learning guidelines: Guidelines describing what children should know and be able to do before they start kindergarten (Daily, Burkhauser, & Halle, 2011).

Letter recognition: A measurement used in early literacy readiness skills in being able to know what the 26 letters of the alphabet (Child Trends Data Bank, 2015).

Listening comprehension: The process of constructing meaning from spoken language (Cadime et al., 2016).

Phonological awareness: The ability to detect, manipulate, or analyze spoken language, including the ability to recognize words, syllables, or phonemes (Lonigan & Shanahan, 2009).

Readiness: Cognitive and social skills necessary for school success (Babić, 2017).

Reading Baseline Inventory: An assessment used to track student progress on readiness, letter recognition, phonological awareness, listening comprehension and concepts of print skills (Scott Foresman, 2006).

Reading readiness: Acquired knowledge of the alphabet, concepts of print, vocabulary, memory, and phonological awareness skills (Lonigan & Shanahan, 2009).

School readiness: A complex concept relating to a child's readiness at the age of five to learn in a school environment (Gaynor, 2015).

Significance of the Study

School readiness continues to be a major concern of educators across the nation. Researchers have noted that high-quality early childhood education programs are directly related to a student's success in early childhood (Barnett et al., 2017; United States Department of Education, 2015). School readiness and performance has been an ongoing national concern (Davoudzadeh, et al., 2015). In 1990 the National Educational Goals Panel (NEGP) established its first goal of having all children in America ready for school by the year 2000 (National Education Goals Panel, 1995). Members of the NEGP collected data to monitor the progress of meeting this goal. The results of this special report showed that the goal was far from being met at that time. Almost 20 years after the NEGP's initial goal,

school leaders are still faced with the problem of students starting school without the necessary readiness skills (Child Trends Data Bank, 2015).

The results of this study provide the needed data-derived findings that local administrators and other stakeholders need to address the pre-K and kindergarten service delivery model and curriculum used to decrease the number of pre-K students entering kindergarten without the necessary reading readiness skills. As a result of this research study, educators may gain a greater understanding of when students begin to fall behind and the role kindergarten plays in the academic success of students. The results of this research affirmed the reading interventions for the schools studied. However, similar studies could find for the need of remedial resources when students who enter with a gap do not catch up to their peers by the end of kindergarten. This, in turn, would support the development of instructional strategies targeting students' development of early childhood readiness skills.

The results of this study provide best practice recommendations for teaching staff, administrators, and parents of the necessary educational practices needed to ensure all students have the necessary literacy skills, which can lead to improved reading, academic, and career success. I hope that the information derived from this research study leads to improved awareness of the connection between pre-K and kindergarten standards, as well as the importance of ensuring these skills are addressed at the appropriate timeframes for skill acquisition. The findings of this study should encourage dialogue between the districts' teachers of pre-K and kindergarten in supporting the needs of these early learners who will, in turn, benefit from this collaboration with the goal being an increase in the number of pre-K students entering kindergarten with the necessary reading readiness skills.

Research Questions and Hypotheses

RQ1: What are the within-group differences in the beginning-year and end-of-year RBI test scores for students who entered school with a reading readiness gap and students who entered school without a reading readiness gap based on their DIAL-4 screening results?

$H_0$1: There is no significant within-group difference in the beginning-year and end-of-year RBI test scores among students who entered school with a gap in their reading readiness skills based on the DIAL-4 screening results.

H_a1: There is a significant within-group difference in the beginning-year and end-of-year RBI test scores among students who entered school with a gap in their reading readiness skills based on the DIAL-4 screening results.

$H_0$2: There are no significant differences in the beginning-year and end-of-year RBI test scores among students who entered school without a gap in their reading readiness skills based on the DIAL-4 screening results.

H_a2: There are a significant difference in the beginning-year and end-of-year RBI test scores among students who entered school without a gap in their reading readiness skills based on the DIAL-4 screening results.

RQ2: What is the between-group difference in the RBI change scores between kindergarten students who entered school with a gap and students who entered school without a gap in their reading readiness skills based on the DIAL-4 screening results?

$H_0$2: There is no significant difference in the RBI change scores between kindergarten students who entered school with a gap and students who entered school without a gap in their reading readiness skills based on the DIAL-4 screening results.

H_a2: There is a significant difference in the RBI change scores between kindergarten students who entered school with a gap and students who entered school without a gap in their reading readiness skills based on the DIAL-4 screening results.

Review of the Literature

I used the Walden University databases, Academic Search Complete, Education Source, ERIC, ProQuest Central, EBSCO, and Sage Premier as my databases for the research. I read through texts and previously published dissertations. The following keywords were used to search the databases: *early childhood development, pre-K readiness, kindergarten readiness, school readiness, early literacy skills, early reading skills, early childhood theories, early childhood theorists, theories of Lev Vygotsky, early childhood curriculum, early childhood assessments, developmentally appropriate practices, early childhood education, pre-K,* and *kindergarten programs.*

This literature review provides an overview of the research concerning the overarching topic of school readiness and how it relates to students' academic abilities in kindergarten. This research study was focused on reading skills, which researchers consider as one of the school readiness skills (Child Trends Data Bank, 2015; DeBruin-Parecki & Slutzky, 2016). School readiness skills are discussed in more detail in the literature review. The purpose of this literature review was to examine the areas of early childhood

development and education and the influences that may directly relate to the outcomes of early literacy scores.

Philosophers, theorists, psychologists, and educators have studied the process of learning in early childhood and effective educational practices (Hesterman, 2013; Horner, Sugai, & Fixsen, 2017; Roskos & Neuman, 2014; Schulz, 2015; Tayler, 2015). There have been many studies from theorists over the years; examples include Dewey's belief of the child-centered curriculum built around the interests of the child (Roth & Jornet, 2014), Froebel's belief of playing-to-learn with adult guidance and planning (Best, 2016), and Piaget's belief that children acquire knowledge by interacting with the world around them (Goodwin & Webb, 2014). The theoretical framework for this research study was based on the work of Vygotsky's theory of constructivism, where students build knowledge based on experiences with other individuals (Vygotsky, 1978).

Theoretical Framework

Vygotsky's theory involving the provision of experiences in educational settings is being implemented to help further understand the process of true experiential learning and the influences that it may have on students (MacDonald, 2015; Roth & Jornet, 2014; Veraksa, Shiyan, Shiyan, Pramling, & Pramling-Samuelsson, 2016). I addressed students' readiness skills and future reading achievement of kindergarten students. The theory of constructivism holds the belief that children construct or build upon their knowledge based on the experiences that they have been exposed to (Vygotsky, 1978). Constructivism in early childhood has been deemed developmentally appropriate for early childhood education (Veziroglu-Celik, & Acar, 2018) The theory of constructivism, as well as Vygotsky's

beliefs of psychology and human development, continue to intrigue modern researchers as they study relationships between this psychological theory and the educational practices used in education (Clará, 2017; Dafermos, 2014; Jovanović, 2015; Khinkanina, 2014). These beliefs can and do transcend into classrooms in the United States, especially the role of incorporating everyday activities into social play. Researchers such as Andrews (2015) discussed the importance of providing students with opportunities for social play in the classroom. For example, Andrews found that during social play, students are able to enhance their oral language skills, social skills and problem-solving skills. With a little support from the teacher, the students were able to construct more meaning when working on a specific task, which supports Vygotsky's theory involving constructing knowledge.

In this study, I used the theoretical framework of constructivism as a lens to view students' abilities to attain knowledge through the interaction with peers and adults. Ogunnaike (2015) noted that Vygotsky views a child's ability to collaborate on a specific task on one day and then the ability of that child to complete the task independently at a later time is due to the fact that there was appropriate interaction within the child's zone of proximal development (ZPD). The ZPD resonates with this study since students are expected to be taught and to learn developmentally appropriate activities. Students would be expected to be exposed to learning opportunities that would help to reinforce the learning of specific tasks and skills. Typically, learning is then further examined and reinforced using assessments meant to show mastery of specific standards and practices.

Vygotsky's (1978) general theory of intellectual development suggests that mental functions are acquired through social relationships with the acknowledgment that each child

has a ZPD and students will construct knowledge based on what they experience. Vygotsky used the term, ZPD, as he described the range of ability children have to complete specific tasks independently as well as the ability to complete tasks with the help from peers and or adults. Student growth is supported when they receive the appropriate support within their own ZPD (Mishra, 2013). Vygotsky also stressed the importance of exposing children to literacy skills at an early age to achieve success in formal school settings and emphasized providing opportunities for students to learn from the process of thinking rather than learning how to memorize information. There are other aspects regarding how students learn and acquire skills necessary for kindergarten. Students need to acquire specific levels of knowledge and skills within intervals of time for them to acquire the necessary reading skills. Brown, Feger, and Mowry (2015) emphasized the importance of teachers offering early childhood students opportunities throughout the school year to gain the knowledge and appropriate skills necessary to be successful as they enter kindergarten.

In relation to Vygotsky's theory of constructivism, students need opportunities in their classrooms or early childhood settings to construct the necessary knowledge and make connections between these interactions and early literacy skills. Interactions with students within play settings provides ample opportunities for teachers to assist with the progression of learning (Bluiett, 2018; Devi, Fleer, & Li, 2018). The theory of constructivism suggests that individuals learn or obtain knowledge through the process of completing tasks within their physical and social environment (Braswell, 2017). Some tasks can be completed without assistance and other tasks may be accomplished, but with the assistance from a peer who is more knowledgeable or a knowledgeable adult. The success of completing tasks is

based on whether the task is within the range of knowledge of the individual (Chigeza, 2016). Constructing knowledge for students will be ongoing during the kindergarten school year. The theory of constructivism assumes students attain knowledge based on their experiences with their peers and adults around them (Wang, Lai, & Wang, 2016). Young children may have limited opportunities for experiences and interactions so the role teachers play regarding this limitation continues to become more important (Sagud, Hajdin, 2018). Vygotsky (2004) believed that children converge their own experiences into their play experiences so it is important to provide ample opportunities for play and adult support. It is hopeful that during the pre-K school year, students will interact with other students and staff and this, in turn, will reduce the gap in reading readiness skills for students entering kindergarten. During the kindergarten school year, it is hoped that teachers will provide opportunities to focus on the specific skills and knowledge related to reading readiness skills within each student's ZPD and therefore reduce the gap in reading readiness skills. Since each student develops during their own ZPD, students may be at different levels when they enter school but they continue to develop within different ranges during the kindergarten school year. This may be evident with the increase of development by the end of kindergarten. The reading program being used in this study is researched-based and contains instructional practices to address all of the components of reading readiness skills for kindergarten teachers.

Review of the Broader Problem

Former President Barack Obama discussed the importance of early childhood education during his 2013 and 2014 State of the Union addresses (White House, 2013;

White House, 2014). Since the introduction of the Common Core State Standards, many educators thought that the standards were not developmentally appropriate for early learners (Little & Cohen-Vogel, 2016; Pondiscio, 2015). The research in this section will focus on a variety of topics that relate to early childhood education. The literature review provides an overview of topics that underpin this study on early childhood development and learning, as well as other concepts that impact each of these particular areas. The purpose of this literature review is to discuss the aspects of early childhood development and learning, and the relationship to reading and literacy connections that relate to student readiness and long term student achievement.

School readiness. School readiness consists of multiple aspects that can be narrowed down even further to early childhood experiences, developmental opportunities and perceptions on student's transition to kindergarten (Cameron, Pinto, Hunt, & Léger, 2016). There are many definitions for the phrase school readiness; but, Gaynor (2015) provided the following definition, "School readiness is a complex concept that overall, relates to a child's readiness at age 5 to learn in a school environment" (p. 27). Some of the researchers focus on both the chronological age of children as well as other readiness elements to describe school readiness. In a systematic review of predictors of school readiness conducted by Linder et al. (2013), the literature revealed that there were seven factors associated with school readiness relating to literacy. These factors are as follows, "child care experience, family structure and parenting, home environment, learning-related skills, social behavior, mathematical and literacy-based tasks, and health and socioeconomic status" (p. 2). The study concluded that by understanding what constitutes positive

environments and appropriate exposure to experiences for children, we can provide the foundation for student school readiness.

The connection between school readiness skills and academic success has been established through research (Brown, 2013; Robinson & Diamond, 2014). Given the varied individual needs of students entering public school, researchers in the early childhood field are seeking to provide suggestions that can improve the focus on school readiness outcomes for all learners (Greenwood et al., 2015). According to Daily et al. (2011), "key factors contribute to children's readiness for school, such as the family context, the context and quality of their child care arrangements prior to school entry, and the resources available within a community to support at-risk children and families, such as health, mental health, family support and nutrition services" (p. 24). In a mixed method research study conducted by Pekdoğan and Akgül (2017), teachers in the study revealed that children needed to possess average academic skills, maintain attention in class, engage in appropriate social skills communication, and demonstrate early literacy skills on level with reading readiness to be considered ready for school. The teachers in this study suggested that school readiness factors could also be determined with the addition of classroom observations to see how students perform in the classroom, relate to their peers, solve problems, and make decisions. Researchers stated that not only teachers but also parents should have a role in providing supports for student's school readiness (Linder et al., 2013; Pekdoğan & Akgül, 2017).

Motor and concept skills. There is a relationship between motor skills and cognitive development and the ability for children to perform early-learning tasks (Mardell & Goldenberg, 2011). There are seven motor skill items in the DIAL-4 screening instrument

that are a combination of gross and fine motor skills. In studies conducted by Grissmer, Aiyer, Murrah, Grimm, and Steele (2010); and Cameron et al. (2012), Achievement pertaining to fine motor skills was a predictor of future achievement; in contrast, achievement pertaining to gross motor skills was not. The researchers in these studies speculated that the positive correlation between motor and cognitive skills could be based on the fact that most tasks that build on cognitive skills also involve the use of fine motor skills such as writing, speaking, and reading. Cameron, Cottone, Murrah, and Grissmer (2016) conducted a review of the literature regarding the link between motor skills and academic achievement. These researchers concluded that gross motor skills were related to social and physical competencies while fine motor skills were associated more directly with academic achievement. The researchers concluded that both fine and gross motor skills needed to be mastered during early childhood educational settings to provide easier transitions into more formal school settings. There are seven concept skill items in the DIAL-4 screening instrument that involve knowledge of colors, shapes, body parts and other items that children should know. These concept skills are the building blocks of knowledge that allow children to organize and categorize information (Mardell & Goldenberg, 2011).

Early literacy skills and reading. Children's language skills grow considerably in the preschool years. The early school years are the foundation for students and their future success. Without an understanding of literacy skills, students often have difficulties reading proficiently (Luther, 2012). The structure and focus of literacy programs can look very different at different grade levels, but the expectation is for students to have acquired the foundational literacy skills by the end of third grade. These foundational literacy skills can

be divided into the categories of constrained skills and unconstrained skills that affect literacy (Snow & Matthews, 2016). Many educators are familiar with the constrained skills, but the unconstrained skills are just as important. Snow and Matthews (2016) described the difference between constrained and unconstrained skills in their recent research. Constrained skills consist of the skills that are teachable because they are finite. Examples of constrained skills are learning the letters of the alphabet and writing one's name. Unconstrained skills are skills that are acquired through experiences and are harder to assess. Examples of unconstrained skills are vocabulary and background knowledge. Snow and Matthews (2016) stressed the influence a teacher has on his/her students in the classroom and the positive correlation between teachers and students using unconstrained skills in the classroom throughout the school day.

Snell, Hindman, and Wasik (2015) conducted a critical review of 34 research studies from 1988-2014 that referenced teaching critical reading skills in early childhood. The researchers focused on the positive relationship between vocabulary acquisition and learning to read. There are specific strategies that teachers can implement during book reading that positively influence vocabulary development. The five research-based strategies which emerged from the study involved defining, questioning, rereading, discussing, and integrating new words throughout classroom instruction (Snell et al., 2015, p. 562). These teaching strategies can be used within different content areas of instruction with teachers providing opportunities throughout the day to practice these strategies. Roskos and Neuman (2014) also provided examples of best practices necessary for improving reading development in young children. They focused on the importance of instructing vocabulary

development, developing knowledge through high- quality texts, rereading the text, motivating students to read and teaching grammar. Research conducted by Hoffman, Teale, and Paciga (2014) discussed the importance of using appropriate assessments to evaluate vocabulary measures in early childhood.

In research conducted by Whittaker (2014), reasoning and problem solving were the research-based strategies that support preschool children's critical thinking skills and are directly related to future success. Fettig, Schultz, and Ostrosky (2016) conducted a study that addressed using storybooks to teach problem solving skills in early childhood classrooms. The researchers found that "problem solving skills are foundational to the development of other skills and success in educational settings" (p.19). Problem solving skills can be taught in the home setting as well as the school setting. Another influence on foundational literacy skills is related to the frequency that a parent reads with their child.

In studies conducted by Sénéchal and LeFevre (2014) and Wieschолek, Hilkenmeier, Greiner, and Buhl (2018) the role of the home literacy environment plays on language and literacy acquisition was shown to be relevant to a child's involvement in reading and literacy enjoyment. Parental involvement in teaching literacy skills through shared reading related positively to the acquisition of early literacy skills. Scholastic (2017) determined that the number of parents (with children between the ages of 0-5) who read aloud to their children before the age of three months increased from 30% in 2014 to 40% in 2016.

The researchers also found that the frequency of reading aloud decreases dramatically after the ages of five to eight. Fifty-nine percent of parents of children ages birth to five read aloud to their children, 38% of parents of children ages 6 to 8 read aloud to

their children and only 17% of parents of children ages nine to 11 read aloud to their children. Gambrell (2015) noted that there is a direct correlation between the time a student spends reading, the type of reader they become, and the interest they have in reading in the future. Brown, Westerveld, and Gillon (2017) corroborated with Vygotsky's (1978) constructivist theory that language development in young children is developed through social interactions. In conclusion, teachers and parents can directly influence early childhood learners to learn to read and enjoy reading through early storybook reading (Gill, 2015).

Early childhood programming. Youn (2016) reported the strong correlation between the amount of time spent in public preschool programs and academic skills learned for children from economically disadvantaged families. Students who attended Head Start for 2 years showed higher acquisition skills in language and math. Cebolla-Boado, Radl, and Salazar (2017) presented additional data regarding the positive correlation between preschool attendance and enhanced reading competence.

According to the United States Chamber of Commerce (2010), the Institute for a Competitive Workforce, high-quality education programs have specific areas of strength that involve ratios of students to teacher, qualifications of the teaching staff, type of curriculum and learning environment, and amount of parental involvement. In a study conducted by Dorman, Anthony, Osborne-Fears, and Fischer (2017), high-quality pre-K classrooms were determined based on specific standards from the universal prekindergarten (UPK) program. These standards included classroom size (staff-child ratio of 1:10), educational attainment of teachers (at least a 2-year degree with a plan for attaining a 4-year

degree), curriculum, family engagement as well as community resources for families. The results of the study concluded that there was a positive relationship between students who attended high-quality pre-K programs and attainment of school readiness skills.

Early Childhood Education (ECE) curriculum frameworks may vary from state to state. According to Wood and Hedges (2016), curriculum frameworks consist of the following: a child-centered approach to exploration, discovery, and inquiry; the use of play through choice and voice; curriculum inclusion through activities and experiences; teacher identification of student's interests and needs in planning process; and planned group activities to introduce specific content. Researchers have noted that not only is designing curriculum important for ECE, but also how students learn must be incorporated into the final product (Dinnebeil, Boat, & Bae, 2013).

One of the major concerns regarding the guidance about developmental goals and the content of children's learning is seen to be inconsistent as there continues to be a disconnect between curriculum theory in early childhood development and pedagogical theories (Wood & Hedges, 2016). Teachers from education programs should have the opportunity to combine early childhood theory and practice in their classrooms (Bauml, 2016; Griess & Keat, 2014). In research conducted by Ridgway and Quinones (2012), play and pedagogy were modeled to show how they looked in classroom practice. Positive outcomes have been noted when there is a combination of academics and play activities (de Haan, Elbers, & Leseman, 2014). By understanding what the researchers stated regarding the importance of high-quality early childhood education and the specific requirements that

need to be met for school readiness, all stakeholders can help prepare students for school success.

There needs to be a collaborative process between the pre-K teachers and the kindergarten teachers to help ensure that the required skills are being taught to all students regardless of their backgrounds (Gambaro, Stewart, & Waldfogel, 2015; Millea, 2014). DeBruin-Parecki and Slutzky (2016) based their research on focus group discussions regarding how pre-K and kindergarten staff can work together to align learning standards. The researchers concluded from the findings that standard alignment of pre-K and kindergarten standards was a necessary priority in early childhood education classrooms. Standards alignment had positive implications for all stakeholders such as informing appropriate professional development opportunities, establishing clear expectations for students and staff, teaching developmentally appropriate lessons, and collaborating and communicating among grade levels to ensure teachers are following a continuum of learning standards (DeBruin-Parecki & Slutzky, 2016).

Students need to learn the appropriate readiness skills and need the time to practice them before entering kindergarten (Bassok & Galdo, 2016). The results of this study can be used by teachers, parents, and administrators to determine what specific readiness skills children would be expected to master prior to formal school attendance. The combination of skills that are achieved at home prior to entering formal education as well as skills learned at school is directly related to establishing a student's school readiness profile.

Implications

With the increase in the number of students entering kindergarten without the necessary readiness skills, it is imperative to provide teachers, parents, and school administrators with information that can help to address this issue (Goldstein et al., 2014). The goals of this study included the refinement of understanding about which reading readiness skills students are lacking when entering kindergarten. The combination of skills achieved at home as well as school is directly related to establishing a student's school readiness profile.

While analyzing the secondary reading readiness data, specific areas of concern could have emerged as the overall readiness and subtest scores were examined for students entering school with a gap and those entering without a gap. The results may have also provided valuable information to the teachers enabling them to possibly reevaluate and restructure the delivery of information and adjust their lesson plans accordingly.

The resulting findings could also have provided district leaders with guidance on the interventions needed for students entering school below level or without needed readiness skills. In addition, the data could have provided critical information for pre-K administrators to discern specific reading program needs for students who were preparing to enter kindergarten. Finally, these data may also have provided leaders at the target sites with specific evidence regarding support for students who enter school at the advanced or on-level ratings so that accelerated progress may be considered through specific, additional interventions or resources.

During the research design phase, while projecting about the possible findings of the study, several project genres were considered during the research proposal conceptualization. The tentative directions for the proposed project included professional development training that could address components of early learning readiness reading skills. In that project, components could address each of the skills, developmentally appropriate instructional practices, possible interventions, and educational theory related to the phenomenon being studied. Had the data analysis indicated specific readiness skills that students were lacking, the lack of those skills could have been addressed individually using teaching strategies and targeted interventions. In addition, professional development training could have contained resources and information that teachers could have used in their classrooms and implemented immediately.

Summary

Children's lack of school readiness skills continues to be a concern in the local district as well as around the United States (Gaynor, 2015). This section provided a foundation and overview of the literature regarding early childhood education, what constitutes and comprises school readiness, as well as Vygotsky's (1978) constructivist theory regarding experiential learning. While views of early childhood education have changed over the years, there are fundamental aspects that need to be addressed in classrooms today. If the goal is to increase the likelihood of academic success for early childhood students, the concerns discussed in this study need to be addressed in an ongoing manner.

Over the past several years, researchers have conducted studies to evaluate early childhood assessments (Greenwood et al., 2015; Hoffman et al., 2014), review early childhood policies (Tayler, 2015), compare early childhood theories and theorists (Ogunnaike, 2015; Roth & Jornet, 2014) and inform early childhood stakeholders of the importance of how these topics interact and influence each other. These areas regarding early childhood education and school readiness can influence the way that students are instructed during school and at home. Much of the extant research has helped to link specific details that can determine student success prior to entering formal school settings. Together, stakeholders can increase the likelihood that more students will come to school with the necessary readiness skills. By entering school with the necessary readiness skills, students can then focus on acquiring the reading skills necessary to become successful in academic settings.

In Section 2 of this project study, I discussed the specific methodology used to answer the central and sub-questions discussed in Section 1. I described the sampling procedures that were used, how the data was collected, and the data analysis procedures used to answer the research questions that I have identified in Section 1 so the local gap in practice and local problem identified could be further explored.

Section 2: The Methodology

Research Design and Approach

There are three major research approaches to consider when deciding which type of research will work best for a research study: quantitative, qualitative and mixed methods (Creswell, 2012). After reviewing each type, I used the quantitative approach for this research study. In quantitative research studies, researchers summarize their findings numerically (Lodico, Spaulding, & Voegtle, 2010). Creswell (2012) stated that the quantitative approach is best suited for studies that employ statistical procedures, identify variables, and measure data numerically. The quantitative approach was chosen as the appropriate type of research design for this study because I collected numerical data from the student assessments and conducted statistical analyses.

Similarly, I sought to discern the differences between two groups of students, students entering school with a gap and students entering school without a gap in reading readiness skills, and to determine if change scores between the groups were significant over one school year. To determine significance numerical data was needed, and statistical tests were used. The problem statement, as well as the purpose statement of the study, were reviewed to ensure the approach would be appropriate. Because the RBI pre and posttest scores were interval measures, the use of inferential statistics to determine if there was a significant difference in pre and posttest change scores between the two groups was deemed appropriate (Lodico et al., 2010).

Responses collected through text are subjective, so that progress or change between the two groups could not be accurately measured. The qualitative approach is more

subjective in that it relies on opinion, personal experiences, and viewpoints that can vary from person to person. Qualitative data are interpreted and build from general themes. For these reasons, qualitative would not be appropriate for this study as qualitative research focuses on giving voice to the feelings and perceptions of the participants of the study (Lodico et al., 2010). In qualitative research, the data collected are focused on participants discussing their experiences and views related to a specific topic and are reported in narrative form. In this study, I was not looking to see how students feel about their educational experiences or achievement, but rather if their reading knowledge and skills improve during their kindergarten year to the point that they reduce the gap that they entered school with compared to their peers.

A unique feature of this research was to employ a random sample generator in the second research question to equalize the size of the two groups for the independent samples *t* test (Kim, 2015; Singh & Masuku, 2014). While random sampling is not a typical characteristic of ex post facto research (Salkind, 2010), the technique was employed here to guard against unreliable *t*-test results when the normality assumption is in question and group sizes are very unequal (Kim, 2015). This design noted the difference between two groups of students, students who entered school with a gap and students who entered school without a gap. This quantitative research study provided data regarding how the overall reading program in kindergarten prepares students with reading readiness skills. With this in mind, a quantitative study was the most appropriate approach for this study since the data collected was in the form of secondary data provided by the school district's research coordinators.

The problem addressed by this study was that 22% of kindergarten students were assessed as having a gap in their reading readiness skills based on their preschool readiness scores on the DIAL-4. The purpose of this quantitative study, therefore, was to examine and compare the beginning- and end-of-year RBI scores of kindergarten students who entered school with a reading readiness gap and those who entered without a gap to determine whether the gap was closed by the end of their kindergarten school year. The RBI assessment consists of a composite score for the total test as well as the subtests scores of the skills being assessed. For this study, I used the composite score of the five subtests.

The five subtest reading skills are readiness, letter recognition, phonological awareness, listening comprehension, and concepts of print. The research questions reflect the total test scores that were compiled from one assessment, the RBI assessment, given to students in the fall of kindergarten and then again in the spring of kindergarten. I examined the change scores of students on the overall RBI composite scores to determine whether the change scores were significant when comparing the students who entered school with a gap and students who entered school without a gap.

Setting and Sample

The study was conducted in a rural district in Maine. The school district had three elementary schools, one middle school, and one high school. The population for this study was students who attended kindergarten during the 2016-2017 school year. One of the elementary schools was a Grade 3 through Grade 5 school and was not included in this research study because they did not enroll kindergarten students in the school. Participants were from the two other elementary school campuses, Campus A and Campus B, within the

school district. Table 2 provides the kindergarten student demographics for the two campuses.

Table 2

Campus A and Campus B Student Demographics

Students	Campus A	Campus B
Total Each Campus	349	234
Kindergarten	96	31
Males	59%	35%
Females	41%	65%
Title I Services	44%	23%
Disabilities	67%	10%
White	82%	100%
Free/Reduced	69%	39%

Combining the available student records from both campuses resulted in 127 potential kindergarten students for the study; 96 from Campus A and 31 from Campus B. The rationale for combining the kindergarten students from the two campuses was that both campuses used the same reading intervention program. The data regarding the number of students entering school with a gap and without a gap were made available to me after I received permission from the IRB to collect data for this study.

Sampling Strategy

Census sampling was chosen for this research study as I included every student that was considered part of the population, which provided a sample population of 127 kindergarten students. I used the raw data provided to me by each school's research coordinator. Census sampling was considered to be appropriate for this type of research

because my initial goal was to use the entire population of qualified participants for this study. Census sampling is generally used when the researcher is trying to obtain data from their own school or district, the population is small, and the data would be useful to make decisions in relation to the specific district (Lodico et al., 2010). The criteria for having completed the pre and post-RBI assessment as well as the DIAL-4 was used to determine the population for this research study. As explained below, not all students completed all criteria for participation, and those student records were pulled for the *t*-test comparisons. Because staff in this district perceived there was a problem and all the students' records were available to be collected for analysis, it was reasonable to characterize the sample as census for this study.

According to Creswell (2012), researchers conducting studies with statistical procedures can use a sample size of 30 participants. Campus A and Campus B had a total of 583 students from grades pre-K to Grade 5; however, there were only 127 kindergarten student records that comprised the census sample. This number was reduced because some of the kindergarten students did not meet the criteria for inclusion, which was the completion of both the DIAL-4 and the pre and post-RBI assessments. There were a total of nine students who did not meet the criteria for the study. Likewise, the sample for this study was reduced to 118 students (92 without a gap and 26 with a gap) due to missing data in nine of the received student records.

When completing the calculations for the sample size of a research study, there are three factors that should be considered. The three factors are identifying the statistical level of significance, deciding the power needed to reject the hypothesis when it is false, and

determining the effect size of small, medium, or large for the study (Cohen, 1992; Lipsey & Wilson, 1993). For this study, the level of significance was set at $p = .05$ or 5% because this provides a 95% confidence level that the conclusions based on the statistical test will be correct. A power of 80% ensures that the statistical analysis will provide valid interpretations of the statistical test results (Cohen, 1992). The effect size chosen for this study was medium, to provide evidence of a relationship between the independent and dependent variables. Based on these power analysis criteria, the approximate sample size needed for an effect size at alpha = .05 was 65 participants; approximately 33 in each group. My sample size of 118 after excluding unqualified participants left a sample of 92 students who entered school without a gap and 26 students who entered school with a gap. The small sample size of the group with a gap ($26 < 33$) was, therefore, accepted as a necessary limitation of the study.

Inclusion and Exclusion Criteria for Sample

My inclusion criteria for the sample from the data set included kindergarten students from each of the two target sites, Campus A and Campus B, from the 2016-2017 school year who took the RBI preassessment in the fall and the post assessment in the spring. Students who did not complete the pre and post-RBI assessment during the kindergarten year, as well as the DIAL-4 test prior to kindergarten, were excluded from this study. Of the 127 student records provided by the two schools, nine contained missing RBI test scores and were excluded from the study, leaving 118 student records for the census sample.

Recruitment

Because I used archival data for this research study, recruitment of participants and intervention treatments were not considerations for the study (Lodico et al., 2010). In this study, I used data that had already been collected by the teachers in the target schools from the described population for my data analysis. I did not have any involvement with the participants in the study. The characteristics of the selected population for this quantitative research study were the students who attended kindergarten during the 2016-2017 school year at the targeted schools, Campus A with 96 kindergarten students and Campus B with 31 kindergarten students for a total population of 127 students. I received the potential number of students who were excluded from the study based on the prerequisites of the study after I received permission to collect the data. The kindergarten students had to have taken the DIAL-4 screening assessment before entering school to be categorized as entering school with a gap or without a gap in reading readiness skills, and they had to have completed both the pre-and the post-RBI assessment in its entirety to be included in this research study.

Instrumentation and Materials

For the independent variable, I used the DIAL-4 tool. The local district educators assessed the level of school readiness through the use of the DIAL-4 (Mardell & Goldenberg, 2011). The DIAL-4 is a global screener that is used to assess children quickly and efficiently from 2 years 6 months (2:6) to 5 years 11 months old (5:11). For example, a child who is 2 and a half years old would be represented as (2:6). The first number (2) represents the number of years old and the second number represents the number of months

old. The screener is designed with 2-month intervals and the chronological age (2:6-5:11) of each student is used to measure his or her skill level to determine readiness/functional level status by skill set for kindergarten.

The DIAL-4 record form is used in conjunction with a guide that rates each student's reading readiness based on their chronological age that is divided into years and months. The skills that the DIAL-4 measures include: (a) motor, (b) concepts, (c) language, (d) self-help, and (e) social-emotional skills. For this study, I used the data collected from the motor, concepts, and language sections of the DIAL-4 because each of these three skills is directly related to reading readiness (Mardell & Goldenberg, 2011). The motor skills, concepts skills, and language skills sections each have a maximum total of 35 points for a total of 105 points. The motor, concepts, and language scores are weighted based on the age of the student.

Teachers use the guide to align the scores on the motor, concepts, and language along with the student's age to determine the overall decision of having a gap or not having a gap in readiness skills. School districts determine the cutoff levels that indicate potential developmental delays based on the DIAL-4. For this district, there were five cutoff levels, 16%, 10%, 7%, 5%, and 2%. The levels were based on standard deviations below the mean. The 16% cutoff level is associated with a score that is more than one standard deviation below the mean. The 10% cutoff level is associated with a score that is more than 1.3 standard deviations below the mean. The 7% cutoff level is associated with a score that is more than 1.5 standard deviations below the mean. The 5% cutoff level is associated with a score that is more than 1.7 standard deviations below the mean. The 2% cutoff level is

associated with a score that is more than 2 standard deviations below the mean. This school district chose the 10% cutoff level for the 2016-2017 school year for students to be grouped with a gap and without a gap.

The district has used this assessment for the past several years to categorize students as entering school with a gap or without a gap in school readiness skills. Based on these criteria, 31 student records (26 after removing missing data records) were categorized as with a gap and 96 (92 after removing missing data records) were categorized as without a gap. Table 3 shows the age and corresponding cutoff scores to determine the students with a gap and without a gap.

Table 3

2016 – 2017 DIAL-4 Cutoff Scores Based on Age

Age	With a Gap Score	Without a Gap Score
4:0-4:1	0-37	38-105
4:2-4:3	0-40	41-105
4:4-4:5	0-44	45-105
4:6-4:7	0-47	48-105
4:8-4:9	0-51	52-105
4:10-4:11	0-55	56-105

For the dependent variable, I used the RBI (Scott Foresman, 2006). The RBI is a component of the Reading Street reading program used by the target school district. All kindergarten students during the 2016-2017 school year participated in the reading program, so the RBI pre and post assessments were a convenient and appropriate data source for this study. This assessment was appropriate because it measures the specific reading readiness skills that students need for kindergarten. As practiced at the time of the study, teachers used the results to assign the students to an appropriate group level for reading instruction. This

instrument has been used by a wide variety of educators, from educational researchers who developed the curriculum, to teachers who use the instrument in an applied manner, to educational administrators who have reviewed and selected this instrument over others (Gatti, 2011). In the case of the local district, the instrument and the curriculum have been used for the past 10 years. It is reasonable to state then that the instrument has acquired a high level of face validity over the years such that users see the instrument as valid and reliable. The assessments were developed by Beck Evaluation and Testing Associates, Inc. and were validated through Gatti Evaluation (Gatti, 2007). There were four phases of research in the development of the Reading Street curriculum and the embedded instrument to assess the effectiveness of the curriculum to raise reading scores (Pearson, 2009).

The first phase involved evaluating the curriculum to determine the appropriate instructional practices, based on scientific evidence, and this information was used to formulate a scientific research base. The second phase involved conducting extensive literature reviews on content and related instructional practices used in classrooms. These data were then embedded into the curriculum of the reading program. The third phase involved conducting research on the curriculum under development, through the implementation of field tests conducted in classrooms to continue the formative assessment process of the reading curriculum being developed to support student learning. Information from students, teachers, school administrators, and content specialists was then used to evaluate the development of the curriculum. The final phase of research involved conducting independent, randomized-control studies that were used to provide scientific evidence regarding student achievement on standardized assessments for students who had

participated and had been immersed in the reading curriculum. This information was used to provide feedback and to make appropriate ongoing revisions to the curriculum to meet the needs of students, and teachers (Pearson, 2009). The school district had purchased the Reading Street reading program, and the assessment materials were included for student use; therefore, the district had permission to use the RBI and collect the resulting data. The data that were collected for this research study were the secondary data that had already been collected by the teachers and recorded in each student's cumulative education record.

Concepts Measured by the Reading Baseline Inventory

The Reading Street RBI assessment is based on five subtest skills: readiness, letter recognition, phonological awareness, listening comprehension, and concepts of print. The readiness section includes items about reading readiness skills. Students are asked to circle the correct answers to questions regarding size (smallest, biggest), direction (behind, right, top, bottom, under) straight lines, and objects that grow in a garden (Scott Foresman, 2006). In the letter recognition section, students are asked to circle various capital and lower-case letters of the alphabet. In the phonological section of the assessment, students are asked to circle words that have the same initial sounds, ending sounds, and rhyming words. The listening comprehension section consists of three mini stories with questions that students answer by circling the pictures that correspond to the answer. The concepts of print section is administered individually with each student. There are 10 items that each child should be able to do with a book such as how to hold a book, the parts of a book, top to bottom and left to right tracking, recognizing capital letters, words, identifying sentences, and understanding what a period is (Scott Foresman, 2006). The teacher hands the student a

book and asks the students the 10 items and records the answers on the corresponding section of the total test. Students are expected to answer the questions being asked by using the book to demonstrate the readiness skills being assessed.

Calculation of RBI Scores and Reading Placement

The main purpose of this assessment was to assess the functional reading level of students and examine student level of knowledge on readiness skills that contribute to overall reading success. The data generated by these assessments guide the teachers when assigning the students to the appropriate groups for instruction based on their reading readiness levels.

The only data available and provided by the school district for this study were the RBI total test scores because those were the only data retained by the school district. The following description of the RBI assessment subscales is provided solely for the purpose of adequately describing the instrument, how its total score was computed, and its impact on reading instruction placement. The RBI assessment has a total of 50 questions with each question being worth two points for an overall score of 100 or a value of 100%. Each subtest has a subtest number score and percentage as follows: readiness has eight items, letter recognition has 12 items, phonological awareness has 12 items, listening comprehension has eight items, and concepts of print has ten items. Each test has a subtest score, and there is a total test score calculated by combining all of the subtest scores and using the overall total test score. The number of correct answers yields a percentage of correct responses per subtest. Each correct answer is valued at two points or 2% of the total value. Each response is given equal weighting in the overall reading calculation. Each of the subtest's percentage

scores is added together to get a total test percentage score. The following paragraph presents a short presentation of the RBI placement practices the schools used to tailor the reading instruction based on measured reading ability.

The total test percentage score is used to determine whether the student will be placed in the below level (labeled as strategic intervention), on level, or above level (labeled as advanced grouping) reading instruction group. The three groups are identified as strategic intervention, on level, and advanced. Students who scored below 60% on the total test were placed in the strategic intervention group. Students who scored 60-89% on the total test were placed on the on-level group. Students who scored 90% or more on the total test would be placed in the advanced group. Students who score 25% or lower on the total test are referred to Special Services and provided intensive intervention in another classroom, with additional placement testing as recommended by the publisher (Scott Foresman, 2006). At the time of this study, student placement proceeded as follows. At the beginning of the school year, students receive their baseline placement score and were assigned to their group with an appropriate instructional plan to meet their specific needs. Students were taught the same curriculum, but they were taught the skills at a reading level that aligned with their assessment results. Performance during the following weeks determined whether the correct placement had been made and whether group reassignment was needed. Thus, students were reassigned throughout the year to different instructional groups based on their performance on their reading assessments that were administered as part of the instructional programming. The beginning-of-year placement scores and the end-of-year placement scores were used as the depending variable for this study.

Reliability and Validity

Pearson (2009) focused on using research-based methods for their educational materials. In the Pearson Research Overview (2009), there were several studies that addressed the issues of reliability and validity of the Reading Street products. A quasi-experimental study that included Grade 1 through Grade 3 students was conducted by Newman and Jaciw (2005) to evaluate the effectiveness of the Reading Street program. The students who were Reading Street users had a mean of 72.028, and the nonusers of the program had a mean of 62.550. The Reading Street users had a gain of 9.48 compared to non-users of the program across all of the three grade levels. Gatti (2006) conducted a quasi-experimental study in which the researchers compared district level pre-Reading Street adoption reading scores in grades kindergarten through Grade 6 to post-adoption year scores. The researchers found that 88% of the districts and grades experienced an increase in their state scaled reading achievement scores. Pearson collaborated with a group of measurement and assessment experts from Gatti Evaluation, and the Wisconsin Center for Educational Research to conduct a study regarding content validation on the questions in the Reading Street program. The data collected from this study led to more collaboration in editing and revising any questions on the assessments that needed to be modified to improve validity.

During the first year of print for Reading Street, 2005-2006, Pearson wanted to gain empirical evidence of the effectiveness of the Reading Street program so Wilkerson, Shannon, and Herman (2006) of Magnolia Consulting collaborated to conduct a randomized control trial study from three states with approximately 1000 students to research the

effectiveness of the Reading Street program. The students chosen for the study were strategically selected to ensure there were varied levels of reading abilities, ethnic diversity, and other varied factors. The researchers concluded that students who used the Reading Street program showed statistically significant gains in reading achievement during the one year study. During the second year (2006-2007) of publication, Wilkerson, Shannon, and Herman (2007) of Magnolia Consulting conducted another randomized control trial study for further evidence of the program's effectiveness. This study included six schools from four states. Again, there were varied levels of reading abilities, ethnic diversity, and other varied factors. The researchers found that students using Reading Street significantly increased their reading achievement and each group of students showed growth from the pretest to the posttest. During the 2008-2009 school year, Berry, Byrd, and Collins (2009) of Claremont Graduate University conducted a quasi-experimental study to test the effectiveness of the Reading Street as well. The sample for the study consisted of 26 schools from seven states located in the northeast, midwest, and southeast. Maine was included in the sample from the northeast, but these schools were not included in the study. Researchers from this study found that students using the Reading Street program significantly improved in reading achievement throughout the 2008-2009 school year and the results of those processes published in previous studies.

If a reading program is achieving gains that are being research validated, one might assume that the instrument is validated as well. Since the RBI instrument was developed as part of the curriculum, which has been developed through a research-based process, the developers consider the instrument to be valid and reliable given it shows an increase in

achievement with its use. The instrument has been edited and revised and continues to be validated through the use of research studies on new editions of the reading program (Gatti, 2011).

Assessment Administration

The RBI assessment is scripted word for word by the teacher. The students are given a copy of the RBI assessment, and the teacher decides how much of the assessment will be completed at each setting. The readiness, letter recognition, phonological awareness, and listening comprehension sections are administered whole group while the concepts of print section is administered individually. The RBI includes a chart with the section, number of questions and the estimated time needed to complete each section. The readiness section consists of eight questions and the estimated completion time is approximately ten minutes. Students are asked to circle the correct answer from three possible pictures. The letter recognition section consists of 12 questions and the estimated completion time is approximately 10 minutes. Students are asked to circle the correct answer from four possible letters. The phonological awareness section is subdivided into three groups: initial consonant sounds, final consonant sounds, and rhyming words. Each of these subcategories consists of four questions, and the estimated completion time for each subgroup is approximately 5 minutes. Students are asked to circle the correct answer from three possible pictures. The listening section consists of eight questions and the estimated completion time is approximately 15 minutes. Students are asked to circle the correct picture, word or number. The concepts of print section consists of 10 questions and the estimated completion time is between 5 to 10 minutes. Students are asked to show their answers with the use of a

book that has been given to the child during this part of the assessment. The RBI assessment may be administered in three or more sittings with about 15 to 20 minutes per sitting with a total estimated time of between 55 to 60 minutes to complete the entire assessment. This baseline assessment is not meant to be timed, and students should be provided ample time to complete each request, but the developer has provided teachers approximate times for scheduling purposes.

Data for the Study

Each year, the teacher transfers the scores from each student's test booklet to his or her Kindergarten Baseline Test Evaluation Chart, which serves as the recording sheet for the RBI. This chart includes all of the sections of the RBI assessment. The teacher keeps a copy of this initial pretest in a file in the classroom and makes a copy of the results for the administrator of the building. During the month of May, the students repeat the same RBI assessment, and the scores are again recorded on each student's Kindergarten Baseline Test Evaluation Chart. When the school year has been completed, the teacher places each student's Kindergarten Baseline Test Evaluation Charts in each student's cumulative folder in the schools' office, as well as provides a copy to the school administrator. The raw data used for this research study were the composite RBI test scores that the teacher collected during the 2016-2017 academic school year because both participant schools indicated that the subscale scores had been destroyed.

Data Collection and Analysis

The problem addressed by this study was that 22% of students entering kindergarten were starting school without the necessary reading readiness skills based on the DIAL-4,

and there was a need to clarify the extent to which the gap was closed over the kindergarten school year. I used the RBI pre and post assessment composite score data from the 2016-2017 school year to examine the changes in the total RBI test scores. Two groups were compared, those students entering kindergarten with a gap and those students entering school without a gap in terms of their reading readiness skills as assessed by their scores on the DIAL-4. These data in the form of pre and post assessment scores facilitated my research by allowing me to focus on answering the research questions posed in this study.

I received approval from the district granting me permission to use the secondary data from Campus A and B for this research study. I then obtained IRB approval from Walden University (IRB Approval #07-25-18-0199529). I also met with the district superintendent and the assigned research coordinator of the two elementary schools to provide additional details of the research. Once all approvals were obtained, I was ready to begin data collection.

Data Collection Process

After discussing the research study in more detail with the superintendent and research coordinators of each school, I requested the data for the students who took the pre- and post-RBI assessment as well as the DIAL-4 data determining which students entered school with a gap and without a gap. I requested that the data sheet had a column for each of the pre- and post-assessment subtest scores and total test score. I also requested that in another column, the determination of students entering school with a gap and students entering without a gap be recorded as well. These data were available in each student's file located in each of the target schools. All data reflecting the RBI pre- and post-assessment

composite scores were provided in the form of numbers and contained no student identity information. The data were in the form of pre- and post-numerical assessment scores from the RBI assessment used in the kindergarten reading program. The independent variable was the groups the students were placed in based on the DIAL-4. The students who were below average entered school with a gap and those students who were at or above average entered school without a gap. The dependent variable was the change score calculated from the pre- and post-scores from the RBI total test scores from the two groups of students, those who entered school with a gap and those who entered school without a gap in DIAL-4 readiness skills.

Variable Scales

The DIAL-4 Record Form has a section on the front page where the overall decision of the evaluation is made based on the individual subtest scores and the total test score on the sections of motor, concepts, and language readiness skills. The cutoff level and the chronological age (the year and month) of the student when the tool is administered is used to determine if the student is considered to be entering school with a gap, or without a gap. For this research study, only the overall decision was used to determine those students who enter school with a gap and students who entered without a gap. On the RBI, I used the data that was recorded on the Kindergarten Baseline Test Evaluation Chart that provided the overall test scores. The scores were from the pretest taken in the fall and the posttest taken in the spring of the kindergarten school year. The data sheet collected by the research coordinators had the DIAL-4 overall decision of entering school with a gap or without a gap listed as well as the pretest and posttest scores for the total test on the RBI.

Data Analysis

To answer the first research question, I compared the within group RBI beginning-year and ending-year test scores to observe and understand any change in performance that was experienced by each group independent of the other. To answer the second research question, the total test change scores from the pre and post assessment of the RBI were compared for the students who entered school with a gap or without a gap to determine whether the curriculum approach had significantly reduced the reading readiness separation between the two groups. Creswell (2012) recommended the use of inferential statistical tests to compare archived performance variables, so I used the independent samples *t* test to examine the difference between the two groups' change scores.

Assumptions, Limitations, Scope, and Delimitations

Assumptions

There were six assumptions made regarding this research study. First, it was assumed that all students listed on the secondary data spreadsheet had been in attendance for the entire kindergarten school year without any excessive absences. Second, it was assumed that all teachers administered the assessments to all students in the same format and without bias. Third, it was assumed that all teachers providing the reading instruction to the students had received the appropriate training for this reading program. All teachers had mandatory training and professional development with the same instructors, so it was assumed that the teachers had the same training. Fourth, it was assumed that all students had done their best on all examinations and were expected to make appropriate growth throughout the kindergarten school year. Fifth, it was assumed that all students had completed both

assessments, and this requirement was a criterion for participation. Lastly, the scoring and reporting by the teachers of the reading readiness skills scores from the RBI were recorded accurately. It was important for me to address the independent and paired-samples *t*-test assumptions during my data analyses.

Limitations

Limitations of the study centered primarily on the lack of control variables and the small sample size for the group of students with a gap. The results of this research study may have included other factors such as poverty levels, gender, and parental involvement that were not considered. The schools have roughly the same distribution in terms of males and females and other characteristics. I did not control for any of these confounding variables, but using change scores in my data analyses helped mitigate some of these differences. Also, students attended different kindergarten classes from two different schools, causing a lack of control regarding the kindergarten instruction in all classrooms; however, teachers and staff in both schools had the same professional development training and opportunities. Teachers' experience and class sizes were also factors that were not addressed in this study. The small sample size for the group with a gap ($n = 26$) remained a limitation and concern throughout the study. Hackshaw (2008) noted that results from studies with small sample sizes should be interpreted with caution. However, when the data are being used for a specific task; such as the development or evaluation of a new intervention, the sample may be considered adequate depending on the effect size of the resulting statistical tests. Finally, the face validity of the DIAL-4 assessment was a

necessary limitation that was accepted to complete the grouping of the two categories of students.

Scope of the Study

The pre-K and kindergarten classrooms in this district are required to use the Reading Street reading program for instruction in reading. Additionally, the kindergarten teachers are required to use the RBI to assess students' progress in reading skills throughout the school year. The district administrators and teachers have used this reading program for the past ten years. The research being conducted examined students who entered school with a gap and without a gap based on the DIAL-4 screening conducted prior to pre-K. The change scores from the total test score of the combination of the subtests scores of the RBI assessment were used for this study. These scores were examined to determine if there was a significant difference in the RBI change scores between students who entered school with a gap and students who entered school without a gap, as well as to determine the extent to the gap had been closed.

Delimitations

The information obtained from the two schools was comprised of all the female and male students who had attended kindergarten during the 2016-2017 school year and had participated in both administrations of the RBI assessment, as well as the DIAL-4. If students did not participate in both testing dates and the DIAL-4, their information was excluded from the study. Children needed to be 5 years of age by October 15 of the school year in order to attend kindergarten. The students attended either of the schools, based on where they resided. The total participant pool of 127 students was divided among eight

kindergarten classes with a maximum number of 25 students in each classroom. Campus A had six kindergarten classes with a total of 96 students, and Campus B had two kindergarten classes with a total of 31students.

Protection of Participants' Rights

Creswell (2012) discussed the protection of participants from harm as one of the most basic of ethical concerns. All of the features of this research study were conducted with all of the guidelines of Walden University's Institutional Review Board (IRB). The IRB application was submitted to determine whether all potential ethical issues had been addressed.

There was no risk for the participants, as I accessed secondary data that was already collected in the school district to assess student knowledge and proficiency on reading standards; therefore, there was no added stress to the students. I did not have direct contact with any of the students, and the research coordinator of each school collected the secondary data from the academic files of the students. The confidentiality of the participants was protected using a number system for each student as well as the determination of having a gap or not reported on the data spreadsheet as no identifiable names were reported.

The secondary data consisted of a coded spreadsheet that contained the pre- and post-RBI assessment scores and the identification for each student indicating a gap or no gap based on the DIAL-4 screening tool. The research coordinator of each school removed any child's identifiable information before I received the data. I stored the coded spreadsheets of the data in a locked file cabinet in my office. Any digital data is stored on a

password-protected laptop and will be kept there for five years, and at that time all paper and electronic data will be destroyed.

My role in the district was serving as the Director of Instruction and as the Title I Coordinator. My responsibilities included assisting in the decision-making process involving curriculum, instructional practices, and Title I programming for the district. I worked with both schools but more specifically with the administrators of the schools. If teachers or staff members had specific questions regarding curriculum or Title I, it usually went through the administrator first and then through me. Because the final research analysis involved discussing the results with the research coordinators of each school, there were recommendations based on the findings of this study. I do not serve in any capacity with the district regarding employment decisions; therefore, I believed that any data analysis does not adversely affect the employment of the teachers who are involved in teaching the students or administrators who are responsible for the teachers whose data were included in this research study.

Data Analysis Results

The purpose of this quantitative research study was to examine and compare the beginning and end of year RBI scores of kindergarten students who entered school with a reading readiness gap and those who entered without a gap to determine whether the gap was closed by the end of their kindergarten school year. The research questions sought to compare the pre and posttest RBI scores within each group, as well as the change scores between the groups. The DIAL-4 data were used only to group the students into the two categories, students entering school with a gap or without a gap and were not otherwise

included in the statistical analysis of this study. This section contains the results of the statistical analyses that were conducted to answer the research questions.

Data records were provided from the partnering school district for 127 kindergarten students from the 2016-2017 school year. The DIAL-4 category of the students having a gap or not having a gap in reading readiness skills served as the independent variable. The dependent variable for RQ1 was the RBI beginning-year (pretest) and end-of-year (posttest) scores for each group. The dependent variable for RQ2 was the between-group RBI pretest and post-test scores. Once records containing missing data were removed, there were 26 students in the with a gap group and 92 students in the without a gap group.

RQ1: Within Group Comparisons

The first research question was addressed using two within group paired samples *t* tests to determine the degree of reading readiness change for each group over the course of the school year. Karagöz and Aktaş (2018) noted the importance of detecting outliers in data sets, as well as using the outlier data for research. Tests for outliers and normality were conducted using the RBI pre and posttest difference scores for the group with a gap. The determination of outliers was assessed using a box plot representing the group with a gap RBI difference scores (Figure 1). There were two outliers detected that were more than 1.5 box-lengths away from the edge of the box. Examination did not reveal them to be extreme (i.e., more than 3 box-lengths away), however, and they were retained for the analysis. Coin (2008) noted that the Shapiro-Wilk test for normality is effective even when outliers are present, and Ghasemi and Zahediasl (2012) affirmed the need for the Shapiro-Wilk test for evaluating normality of difference data distributions for *t* tests. Based on the Shapiro-Wilk

test, the pretest and posttest difference scores were normally distributed (p = .234) and the within group paired samples t test was conducted for the group with a gap.

The posttest RBI scores (M = 88.85, SD = 8.51) were higher than the RBI pretest scores (M = 60.62, SD = 17.17) and the difference was statistically significant for the group with a gap, $t(26) = -11.47$, $p < .001$. Cohen's d = 2.1, indicated a large effect size and a change of more than 2 standard deviations between the difference means. Based on these results, the null hypothesis was rejected. On average, the students with a gap experienced a statistically significant increase of more than 2 standard deviations in their reading readiness based on a comparison of their beginning and end-of-year performance on the RBI assessment. It must also be pointed out, however, that these results should be interpreted with caution due to the small sample size (n = 26) for the group of students with a gap. The t-test results are provided in Table 4.

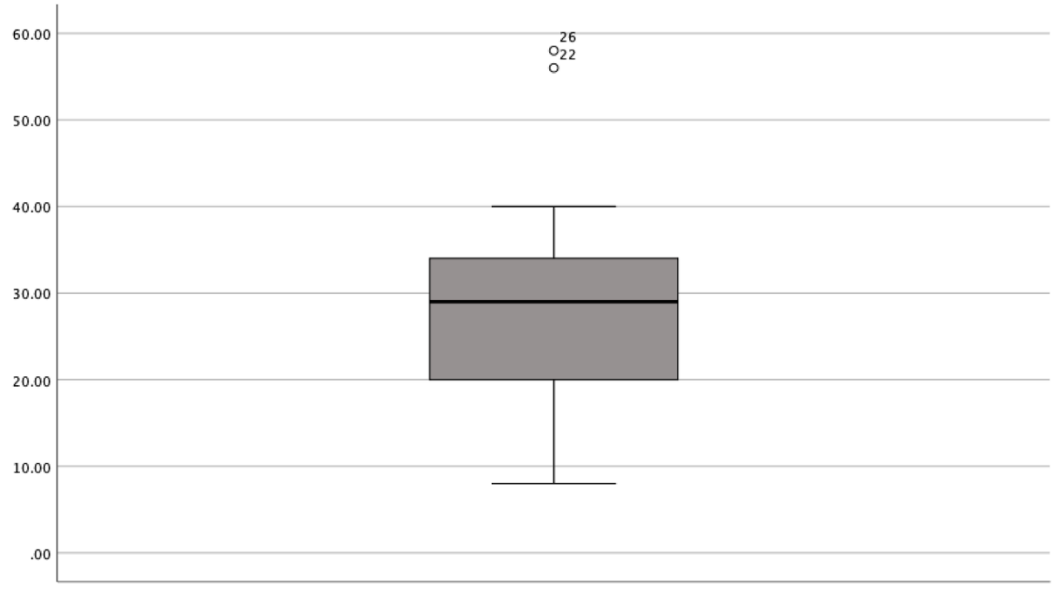


Figure 1. Box plot for with a gap group pre and posttest RBI difference sores.

Table 4

Paired Samples T- Test Results for the Students With a Gap Group

			95% Conf. Interval of the Difference				
Variable Compared	Mean	*SD*	Lower	Upper	*t*	Df	Sig (2-tailed)
RBI Pretest RBI Posttest Scores	-28.23	12.55	-33.30	-23.16	11.47	25	.000

A second paired-samples *t* test was also conducted to determine the degree of reading readiness change for the students without a gap for the school year. Tests for outliers and normality were conducted using the difference scores for the paired-samples *t* test. The determination of outliers was conducted using a box plot representing the difference scores for the group of students without a gap (see Figure 2). There were four outliers detected that were more than 1.5 box-lengths away from the edge of the box, but none were extreme and were retained for the analysis. The Shapiro-Wilk test for normality was consulted to determine if the group of students with a gap data met the normality assumption for the paired-samples *t* test. The pretest and posttest difference scores were not normally distributed ($p < .001$). However, when the sample size is sufficiently large, the paired samples *t* test may be considered fairly robust to deviations from normality (Slavin & Smith, 2008; van Wieringen & Cribbie, 2014) and with a sample of $n = 92$, nearly three times the minimum of 33 determined by my power analysis, the decision was made to proceed with the test.

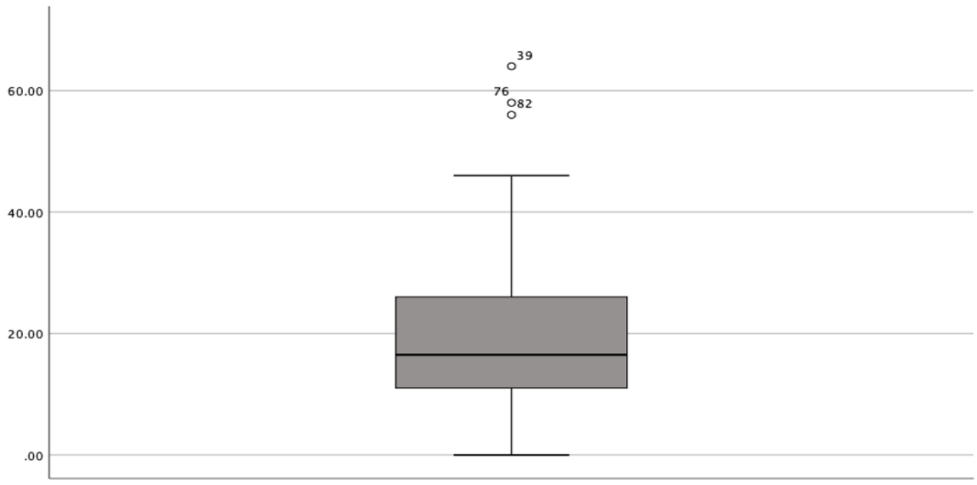


Figure 2. Box plot for without a gap pre and posttest RBI difference scores ($N = 92$).

The paired-samples *t*-test results for the without a gap group are presented in Table 5. The without a gap group post-test RBI scores ($M = 95.64$, $SD = .59$) were higher than the RBI pretest scores ($M = 76.23$, $SD = 1.57$) and the difference was statistically significant, $t(91) = -14.57$, $p < .001$. The effect size of the test ($d = 1.7$) was large and indicated a change of more than one standard deviation between pretest and posttest mean scores. Based on these results, the null hypothesis was rejected. On average, the students without a gap experienced a statistically significant increase in their reading readiness scores of more than 1 standard deviation based on a comparison of their beginning- and end-of-year performance on the RBI assessment.

Table 5

Samples T-Test Results for the Without a Gap Students

			95% Conf. Interval of the Difference				
Variable Compared	Mean	*SD*	Lower	Upper	*t*	Df	Sig (2-tailed)
RBI Pretest – RBI Posttest Scores	-19.41	12.78	-22.06	-16.77	-14.57	91	.000

RQ2: Between Group Comparisons

An independent samples *t* test was conducted to compare the RBI pretest and posttest difference scores between the students with a gap and without a gap. The independent samples *t* test assumes approximately normal distribution within the two groups, and when this assumption is violated, the violation is compounded when samples are dramatically unequal in size (i.e., ratio of smallest to largest group is more than 1.5) (Kim, 2015). With the knowledge from the second paired-samples *t* test that the without a gap group was not normally distributed, and to help guard against making a Type I error when groups are not normally distributed and the group sizes are dramatically different, I used SPSS's random selection function to reduce the without a gap group sample size to n = 26 to match the sample size of the with a gap group (Singh & Masuku, 2014). This process resulted in the two group sizes of 26 for each of the with a gap and without a gap group. Interestingly, as the box plots in Figure 3 show, none of the four outliers for the without a gap group were selected by SPSS for the random sample of 26 without a gap students. Because the smallest group contained only 26 participants, my treatment to gain equal group sizes had the adverse consequence of resulting in only 52 participants as opposed to the 66 recommended in my power analysis.

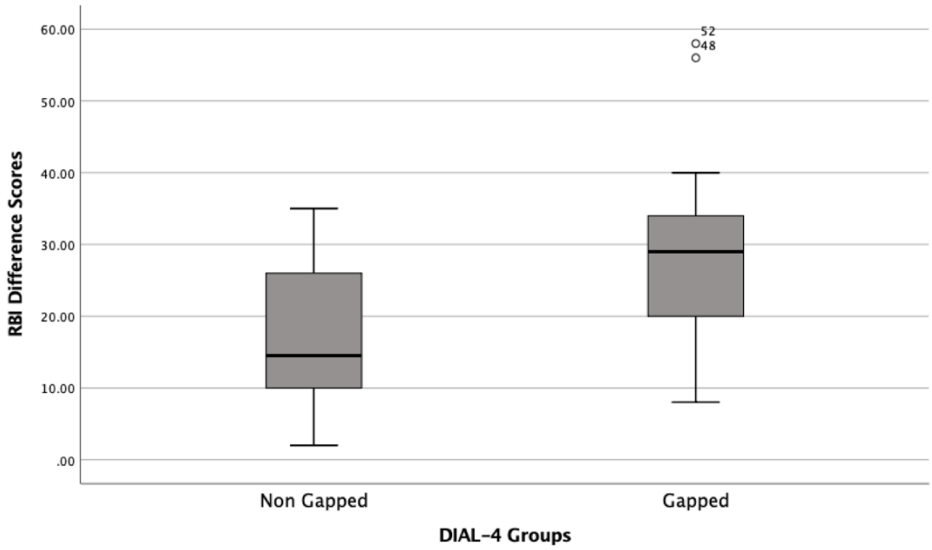
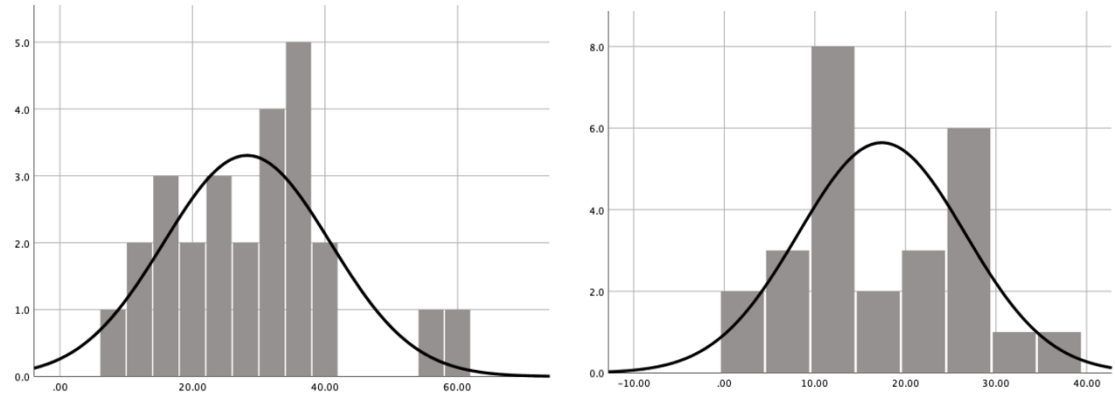


Figure 3. Box plots of the RBI pre and posttest scores for each group ($N = 52$).

Figure 4 presents the histograms for the group without a gap (Panel A) and the with a gap (Panel B) groups. To test for normality of the two distributions, I consulted the Shapiro-Wilk statistic and visually inspected the histograms for both groups. The Shapiro-Wilk statistic confirmed that both the with a gap ($p = .114$) and without a gap ($p = .234$) were normally distributed, although Figure 1, Panel B shows a bimodal distribution. I proceeded with the independent samples *t* test based on the Shapiro-Wilk test result.



Panel A. Without a gap students ($n = 26$). *Panel B.* With a gap students ($n = 26$).

Figure 4. Histograms for the two groups comprising the independent *t* test ($N = 52$).

An independent samples *t* test was conducted to evaluate the null hypothesis that there was no difference between students who began school with a DIAL-4 reading readiness gap and students who entered school without a gap with respect to the RBI difference test scores. An assumption of the independent *t* test is that the standard deviations of the groups are equal. The Levene's Test for Equality of Variances is the most commonly used test in SPSS for checking equal variances across groups. The Levene's Test for Equality of Variances ($p = .320$) revealed that the standard deviations were not significantly different. Therefore, the homogeneity of variance assumption was satisfied and the *t*-test results were reported using the *t*-test row for Equal Variances Assumed (see Table 6). The test was significant, $t(50) = -3.45$, $p = .001$, and therefore I rejected the null hypothesis that there was no significant difference in the change scores between both groups of students. While the two groups remained significantly separate in their reading readiness; the group of students with a gap still lagged significantly behind the group of students without a gap.

Table 6

Independent Samples T-Test Results for RBI Fall-to-Spring Difference Scores

						95% Conf. Interval of the Difference	
Variable Compared	t	*df*	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Difference Scores	-3.455	50	.001	-10.85	3.05	-16.97	-4.72

The group of students with a gap averaged 9 points more in RBI score gains when compared to the group of students without a gap, perhaps indicating that the reading intervention measures taken by the school were somewhat effective in closing the gap.

While the group of students with a gap started off 16 points behind the group of students without a gap at the beginning of the school year, the reading gap had been reduced to only 7 points by school year's end. The 47% gain for the group of students with a gap reported in these findings was very similar to Reading Street interventions reported by Newman and Jaciw (2005), and by Gatti (2006). Confirming findings from previous studies, the overall findings from this study somewhat validated the Reading Street program for reading instruction and interventions among kindergarteners. This conclusion should be interpreted with caution, however, because although the gap was closed by more than half, a statistically significant difference remained between the two groups.

Summary

In Section 2, I described the research method, design, sampling strategy, protection of participants, data analyses, and results that were used for the study. A quantitative research design enabled me to collect numerical data to test specific hypotheses. Archival data were collected and analyzed, and the findings revealed that even though some students entered school with a gap in their readiness skills, the gap was reduced during the kindergarten year. Kindergarten educators from the district will benefit from knowing that their instructional practices are making positive and significant differences for students with a gap. Results of the data analysis suggested that the Reading Street reading interventions worked to reduce the reading readiness gap for the students with a gap, but these students still did not make up all of the gaps in reading readiness skills as compared to the students who entered school without a gap. A white paper was chosen for the project genre to affirm current practices, as well as highlight additional best practices from the research literature.

In Section 3, I focused on the project proper and related literature review. I concluded the study with Section 4, where I provided a retrospective review regarding my doctoral capstone experience.

Section 3: The Project

Introduction

The project chosen for this study was a white paper that will be presented to the administrators and superintendent of the school district in which the study took place. This research study was conducted to compare the change scores of students who entered school with a gap and students who entered school without a gap to see how the students perform at the end of the kindergarten school year. In this section, I will explain the project option that I feel most reflects the results from the data analysis. The rationale for choosing the project, the review of the literature that relates to the specific genre of the project, a description of the project, a project evaluation plan as well as the project implication will be discussed in detail.

Rationale

The primary function of a position paper also referred to as a white paper, is to identify specific problems and to recommend possible solutions to the problems (Owl Purdue Online Writing Lab, 2018). White papers can be as formal or informal as the author likes and can vary in length and content. Creating a white paper that shares the findings of a research study and using research-based recommendations is an effective way to disseminate information in a manner that is easier to understand for those who may not be directly involved in the subject matter.

The school district administrators had been considering the possibility of changing the current reading program. The notable reduction in gaps based on the pre-and post-RBI change scores demonstrated that the group of students with a gap benefitted from the

embedded interventions. One point that may be considered is whether these interventions could be implemented during the pre-K school year. The white paper will both affirm current reading interventions and highlight best practice recommendations from the literature. The results of this study may have a direct impact on the district administrators' curriculum decision about changing the current reading program.

The white paper is provided in Appendix A and will allow me to share the findings of this research study in a clear and concise manner. The white paper will include an introduction, the local problem being researched, the data analysis, and any recommendations in addressing students entering school with a gap.

Review of the Literature

In this literature review, I focused on presenting resources that are related to writing, relevance, and criteria for writing white papers. The findings from this research study revealed that students who enter school with a gap can make significant gains during the kindergarten school year. The research-based reading program addresses all levels of students and seems to be effective in closing the achievement gap between students who enter school with a gap and students who enter school without a gap in reading. For the literature review, I used several sources from Walden University's online library and searched Academic Search Complete, Education Research Complete, Education Source, Google Scholar, ProQuest Central, SAGE, and Taylor & Francis. My initial search terms were limited to those that would lead to research on my chosen project genre, and they included gray literature, white papers, and position papers. Because the results were limited based on these search terms, I then expanded my research to include terms related to recent

best practice reading instruction for early childhood. Related search terms included reading interventions, early literacy instruction, early reading programs, emergent literacy practices, kindergarten readiness, school readiness, response to intervention, and early childhood curriculum. I focused mainly on peer-reviewed articles dated between 2013 to 2018.

The primary function of a position paper, also referred to as a white paper, is to present research on a specific problem and to propose recommendations based on the findings (Owl Purdue Online Writing Lab, 2018). A white paper is an effective choice for the project as it does not require a significant financial commitment nor a significant time commitment for the parties involved in the research study (Lyons & Luginsland, 2014). White papers can be as formal or informal as the author likes and can vary in length and content. Adding visuals and specific examples can make the white paper appeal to more people (Owl Purdue Online Writing Lab, 2018). Creating a white paper that shares the findings of a research study and using research-based recommendations is an effective way to disseminate information in a manner that is easier to understand for those who may not be directly involved in the research proper (Owl Purdue Online Writing Lab, 2018).

I organized the white paper with an outline of the problem addressing students who entered school with a gap in their reading skills, and a discussion of the use of appropriate reading interventions to reduce the gap. The results of this study are discussed and presented. I provide an explanation of the processes used for the data collection and analysis, as well as recommendations based on the research findings. The importance of theory and practice related to the development of reading readiness skills in early childhood classrooms is also discussed. The brief literature review included in the white paper also

includes relevant areas of early reading skills necessary for students to be successful in reading.

Early Literacy Instruction

The Reading Street reading program that is used in the local school district focuses on five subtest skills: readiness, letter recognition, phonological awareness, listening comprehension, and concepts of print. The overall total test score is used to place the students into the reading instructional level of below level, on level, or above level. The data collection and analysis revealed that even though students entered school with a gap, their reading instruction interventions during kindergarten provided necessary instruction and practice to significantly reduce the gap.

Teaching strategies are important for encouraging the development of early literacy. Snell et al. (2015) focused on five key practices from research that specifically helped close the word gap in vocabulary development for students. As per the researchers, early childhood teachers should "define new words, discuss and ask children questions about new words, reread books, engage children in retelling activities, and integrate new words into other classroom activities" (Snell et al., 2015, p. 562). All of these strategies are intertwined in the Reading Street program. Some of the interventions from the reading program were evident in research conducted by Fricke, Bowyer-Crane, Haley, Hulme, and Snowling (2013). These researchers found that students who received early oral language interventions showed improvements in phonological awareness and reading comprehension. The researchers used a pretest and posttest score to determine any changes after the

interventions were completed. Six months after the interventions had been completed, students who were behind performed comparably to their peers.

Robertson, Dougherty, Ford-Connors, and Paratore (2014) noted how many teachers are familiar with instructing students at their current levels, but they are generally not as familiar with instructing students above their levels. This type of instruction may cause students to continually lag. In the cited study, the teachers continually moved students into the next level of reading instruction as they progressed through developing their reading skills. Gersten, Jayanthi, and Dimino (2017) discussed the research supporting small group reading instruction in the elementary grades. Small group reading designs, where teachers are trained to instruct at ZPD levels appropriate for each group, is one instructional strategy to counteract the plateau effects mentioned by Robertson et al. Teaching strategies that target reading for future success is an important construct for achieving significant grade-level gains in reading abilities.

Reading and Future Success

Early language skills, as well as reading experiences, are proven to predict reading success in the future (Justice, Logan, & Kaderavek, 2017; Schryer, Sloat, & Letourneau, 2015). Smart et al. (2017) stressed the importance of early screening and interventions for reading difficulties to support struggling students and to increase the likelihood of these students completing high school. Suggate (2015) discussed school readiness and what defines readiness skills. This study focused on the long-term effects of early reading and future success and suggested that early reading shows only short-term effects and does not improve language development. Suggate's study aligns with Vygotsky's theory of

constructivism in which students attain knowledge based on their environment and students learn through the process of completing tasks within their ZPD. Students in this study who entered school with a gap may not have been learning within their ZPD, but as they advanced through their kindergarten school year, they may have experienced opportunities and may have become "ready" to learn the required skills.

Home Learning Environment

A theme that occurred throughout the literature was students entering school without the necessary reading skills. Research studies revealed the importance of the home learning environment that students are exposed to. Parents can contribute to supporting their children through non-intensive interventions that can support literacy. Book reading is one of the most significant interventions that parents can accomplish (Taylor, Zubrick, & Christensen, 2016). The frequency of parents and other members of the family who read at home, having family members read to children, visiting the local library, the number of books in the home, and other family literacy practices have a positive effect on children's literacy competencies (Niklas, Cohrssen, & Tayler, 2016a; Niklas, Cohrssen, & Tayler, 2016b; Niklas, & Schneider, 2015; Terrell, & Watson, 2018).

Project Description

White papers have been used in business and government and have different formats to follow, but the most common reason is to offer insight into a research study and provide recommendations based on the findings (Hoffman et al., 2014). White papers are also used to educate a specific audience about a problem and in this case, it will be the school district in which the research was conducted (Young Adult Library Services Association, 2013). I

chose a white paper for my project to help disseminate information to the local school district. In the white paper, I discussed the findings of the research in a manner that facilitates an abbreviated presentation than what a formal research paper provides. The literature used throughout the research study and in the construction of the white paper consists primarily of peer-reviewed research articles.

Once I have received final approval from Walden University for my capstone, I will contact the superintendent of the school district and will set up a meeting to present the white paper for his audience. I will be the only person responsible for presenting the white paper. Required resources will include a board or training room of sufficient size to comfortably hold the intended audience. A computer and LCD projector may also be used to present visuals, should they be created.

No new supports will be suggested to maintain the current reading program. For recommended best practice improvements that will be suggested, I will highlight additional resources that would be needed to implement those practices. With the findings of this study, there are no known existing barriers to continuing the current reading program. Based on the findings, the following recommendations will be made:

- The findings in this project should be disseminated to all stakeholders involved in educating these students, such as parents/guardians, teaching staff, administrators, and superintendents.
- Other similar studies should be conducted using the other components of the DIAL-4 assessment to see if the curricula in the other areas are making a similar significant difference. In review, the DIAL-4 components include (a)

motor, (b) concepts, (c) language, (d) self-help, and (e) social-emotional skills.

- Researchers have shown the positive effect of parental involvement in the formation of early literacy skills. A positive step would be to create and offer an early literacy training program for parents and guardians.
- Ensure that all new teachers are trained in the reading program during their new teacher orientation so they can implement the interventions embedded in the reading program with fidelity.

Project Evaluation Plan

The goal of the white paper is to succinctly present the most relevant topics from my research and the literature about the reading achievement of kindergarten students to stakeholders that may include parents/guardians, teaching staff, administrators, and superintendent of the school district. To evaluate how effective the white paper and my presentation of it is, I will provide a formative evaluation, contained at the end of the project, to be completed by those who attend the presentation. The evaluation consists of five stem questions that were written to seek information about the extent to which the white paper was effective in communicating the salient points from the study. The formative evaluation will be sent out electronically. The evaluation will be used to determine how effective the white paper was in describing the research problem, purpose, the findings from the research, and the recommendations. The results of the formative evaluation will provide information about the effectiveness of the white paper and my presentation thereof. The evaluation will also provide the opportunity for the attendees to request more in-depth

explanations or to ask further questions. The purpose of a formative evaluation is to gain information that can be used to improve the work (Lodico et al., 2010). If any report recipients request additional information through there evaluation responses, I will use that information as an invitation to share more.

Project Implications

The white paper is used to succinctly explain what happened regarding students' reading skills when comparing the pre and posttest change scores in reading between students who started kindergarten with a gap in reading ability and those who had no gap. Several questions arose as I conducted the research. Teachers perceive that more students are entering school not ready to be academically successful in kindergarten. The project will provide the data by highlighting the scores of both groups of students. The scores will be from the beginning of the kindergarten school year and the ending scores in reading. The white paper addresses the importance of struggling students receiving interventions as early as possible to help lessen the gap among students entering school. The local school district staff will benefit knowing that the reading program being implemented in the district for kindergarten students is addressing the necessary skills in reading and lessening the gap.

Teachers who perceive that students are continuing to enter school unprepared can be reassured that the reading interventions being implemented in the kindergarten classrooms are closing the achievement gaps in reading. Teachers may also begin to see all students as being successful no matter where they begin when they enter school. The school district leaders had been considering the possibility of changing reading programs when this project study began. The results from this study has clarified that the program contains

interventions that the teachers have been implementing with positive results. The results of this study have far-reaching benefits. In other area districts, stakeholders who may be in the process of making curriculum decisions may be encouraged to conduct similar research and base their decisions on research-derived, objective data.

Section 4: Reflections and Conclusions

Project Strengths and Limitations

By conducting research that addresses a local problem and develops recommendations, I produced a white paper that can be used in this local school district to bring about change. The findings in this study will provide data that can be directly used to address gaps in early literacy skills for students entering school. One of the advantages of creating a white paper is that the information can be disseminated to the stakeholders directly involved in providing instruction and making educational decisions in the school district. The information can also potentially be distributed to area school districts who may be experiencing the same problem with students entering school with early reading gaps in reading skills.

Another strength of the white paper will be the introduction of recommendations that parents can do with their children before they enter school to help reduce the gap in early literacy skills before entering formal education which is considered by many to be kindergarten. These recommendations would not be a financial investment but rather a time investment for family members. The recommendations can be implemented soon after the project study is accepted.

Along with the strengths of the project, there are limitations. For example, the study utilized a nonexperimental design. Utilizing a control group of readers with a gap who had not received the same interventions would have increased confidence that the intervention for this group was indeed the difference maker. As with many social science studies, however, the use of the control groups and random assignment of participants to control and

experimental groups is seldom possible. The sample was limited to 26 in each group and Cohen (1992) recommended a sample size of at least 30 for difference tests to be considered valid. The risk associated with using too few participants is discussed in the literature in terms of making a Type I (false positive) or Type II (false negative) error, and the best way to mitigate both errors is to increase sample size (Cohen, 1992). Bishop and Herron (2015) recognized the importance of including small effect sizes in research studies to help understand the possibility of the significance they may have on a specific population. The possibility of making a Type II error in this situation is high. These considerations should be weighed by school leaders and education practitioners when considering to generalize these findings for their own use.

Recommendations for Alternative Approaches

The problem addressed by this study was that students were starting school without the necessary reading readiness skills based on the DIAL-4 taken prior to pre-K. I used a quantitative approach to address the use of a research-based reading program that provides reading interventions to address the gap based on a pre and posttest assessment given during the kindergarten school year. The total difference score was the criterion measured used for this student, but I could have used the individual scores of each subtest skill, which may have provided more granularity in the results. For example, this additional information may have suggested specific skills to work on that could make even a greater difference in improvement thereby suggesting areas that teachers could spend less or more time instructing. Because this study looked at the scores of the DIAL-4 tool to determine if students are entering school with a gap or without a gap in early literacy skills, it may also

be informative to explore what is occurring at the pre-K level that might be contributing to the gap.

Another approach would have been to conduct a mixed-method study or a qualitative study to formally integrate the perspectives of teachers and administrators on the phenomenon of kindergarten literacy. Qualitative research would have included collecting data using individual and focus group interviews. Classroom observations could have also been included to unpack other, unexpected themes. Time limitations, however, prevented the inclusion of a qualitative component for this study.

Introspection and Reflections

Scholarship

Throughout my doctoral journey, I have continued to hone my skills as a writer. I have always enjoyed writing but discovered there are very distinct differences in the type of writing needed for doctoral students. By having a team of individuals reviewing my work, the emotion of frustration changed to understanding early on in this journey. I had to learn not to take things personally. I eventually realized that every comment and recommendation was given for a specific reason, and that reason was to help me not only to be a better writer but a scholarly writer. I have learned that there is so much more to writing a research paper when compared to simply writing a paper. I have learned the importance of terms that I will never forget such as anthropomorphism, peer-reviewed articles, scholarly writing, validity and reliability, and especially how to access library resources.

When deciding the area that I would research, many ideas came to my attention. All of the ideas I had thought of involved early childhood education and what makes early

learners successful. This area in education intrigues me as one in three students are struggling in reading (Carta et al., 2015; Kaiser & Hemmeter, 2015). I thought of looking at different reading curricula at the pre-K level and possibly conducting a program evaluation, but that changed when one of the potential partnering school districts had made a change in their curriculum. Another thought involved interventions that could be used to help struggling learners; but, as I began meeting with administrators in my new position as a curriculum coordinator, I heard over and over again that teachers and administrators were dealing with students entering school without necessary literacy skills. As a former pre-K teacher, my passion has always been with the early learner and the importance of providing classroom instruction based on best practices. As the process moved forward I achieved increasing clarity, and while I have had to make minor adjustments to the study along the way, my resolve and passion for this topic remain strong. Overall, this process has not only made be a better researcher, but it has also made me a better consumer of research, as well as given me a greater appreciation for decisions that are made based on the good analysis of empirical data.

Project Development and Evaluation

I originally believed that my research would have led to creating some reading curriculum to address any areas of weakness. I also assumed that the results would reveal that the teachers were not able to reduce the gap during the kindergarten school year and I could provide a professional development opportunity focused on interventions that target the specific skills that the students were struggling with. My assumptions regarding the results were incorrect, and the data and data analysis suggested that the teachers provided

effective interventions for the students who entered school with a gap, and that gap was significantly reduced by the end of the kindergarten school year when compared to students who entered school without a reading gap.

The white paper was deemed the most effective way to disseminate information to a specific, targeted group of individuals. I believe that the stakeholders will be very curious about the results and the information provided in the white paper will help to validate the work that has been done recently in the school district regarding the alignment of standards in the elementary grades. The evaluation of the white paper project will be a questionnaire with five questions that will be given to the superintendent, administrators and hopefully, will be disseminated to the teachers and the teaching staff that work directly with the students targeted for this study. The information received from this formative evaluation will help me as a scholar to see if I explained the information in a way that can be understood by the stakeholders. Writing a white paper also requires scholarly writing, but the focus is more directed to the specifics of the research study with recommendations. Thus, the white paper is a very succinct report of the larger research effort.

Leadership and Change

I consider myself as a superintendent to be a leader in education, but I also consider myself a student as well. My responsibility as the educational leader of my school district is to use research-based practices to make decisions that directly affect staff and students. My leadership qualities include the ability to make difficult decisions, communicate effectively, portray confidence in my role, and possess integrity. I have experienced many changes in education over the past thirty years. I am reminded that good leadership is reflected in

decisions that are agreed to be good by the majority of people affected by those decisions (Nelson & Low, 2011). I have learned that I must always continue to reflect on my practice in whatever position I serve. The most influential change in practice that I have experienced is in using data to make decisions. This doctoral journey has validated the importance of using data, including the opinions of stakeholders, in any change process.

Importance of the Work

One of the most interesting aspects of this study involves the continuous work of reviewing current research on the topic of my study. I have been working on my doctorate for several years, and as each year came and went, I began finding more and more peer-reviewed articles than when I first began. Early childhood education has continued to be an increased area of focus. There have been several grant opportunities for schools to begin pre-K programs and to enhance current pre-K programs. With the adoption of the Common Core State Standards, all students at each grade level are expected to meet high standards in literacy (Robertson et al., 2014). It is essential to realize that this study emphasizes the importance of providing struggling early learners with interventions so that they can be successful students because there is a direct correlation between early language and reading experiences and reading success in the future (Greenwood et al., 2015; Schryer et al., 2015). As a researcher and problem solver, I have learned that it is alright to question and look for solutions to solve problems in the realm of education. I will continue to look for opportunities to use my knowledge and skills acquired throughout this process to help others and myself.

Implications, Applications, and Directions for Future Research

The findings from this research study revealed that teachers could reduce the early literacy skills gap in students during the kindergarten school year. Although this research study targeted the kindergarten school year, it would be beneficial to conduct a research study during the pre-K school year. This line of inquiry would provide data and new knowledge based on the resulting data analysis to pre-K teachers. Kindergarten teachers could see which early literacy skills have not been met and could address them much sooner. Teachers can use the data from the research to address this gap even earlier. The implications of this study are far-reaching. More research focused on the specific subtests skills could provide teachers with data that could address specific reading skills that may need more or less instruction. This information could be shared with pre-K teachers and interventions could be implemented during that school year instead of waiting until kindergarten. Further research involving early math skills could also be addressed. Early math interventions could be implemented to assist students who may have entered school with a gap in early math skills.

In the white paper, I provide recommendations that will address many areas of social change. Students may have more confidence in their literacy skills, parents could be more involved with their child's early literacy learning, schools could have increased academic achievement, and communities may realize the importance of continuing to support their local school districts. Vygotsky's theory of constructivism, students, gaining knowledge based on the experiences that they are exposed to as well as understanding each student's ZPD is evident in the results of the research study. Students may begin school with a gap,

but under the right circumstances and when they are challenged with appropriate instruction, are able to achieve significant skill development throughout the kindergarten school year. As this school district contemplates changing the reading curriculum, the results of this study can assist in this decision. The findings lead us to believe that this is an effective reading program and the interventions that are part of the reading program are being used effectively, and the results and data support this conclusion. Additional research could be conducted in area school districts with larger numbers to provide data that can assist teaching staff in the importance of using the interventions provided in the reading program. By using a larger population, the findings may be generalized to a larger population. By addressing the achievement gap between students entering school, many positive outcomes could be achieved. Positive outcomes will be reviewed in the following conclusion.

Conclusion

In the United States, children are entitled to free public education. This education should be comprehensive and developmentally appropriate for each child. For this dream to be possible, there are several factors that come into play. Parents need to do their part in preparing children to enter school, teachers need to do their part in teaching lessons that meet the individual needs of each student, administrators need to do their part in supporting the work of the schools, and communities need to do their part in supporting their school districts. By working together, and addressing the needs of our students as soon as possible, we can begin the process of making positive social change for everyone involved. Students become future citizens in our communities, so it is imperative that we provide every opportunity for them to be successful in schools and beyond.

The findings in this study were not as I expected. When teachers and administrators expressed concerns over the increased number of students entering school without requisite reading readiness skills, I assumed those students would continue as struggling readers. My findings, however, required me to rethink my assumptions. While the findings of the research affirmed the problem with early reading readiness skills, they also discovered that the school district was implementing interventions that were making significant inroads toward solving the problem. The data and the data analysis presented in this study suggested that teachers were able to assist the struggling students through the use of effective research-based interventions and the gap was significantly reduced by the end of the kindergarten school year.

The purpose of this research study and project was to bring attention to a local problem, address the research, collect data, analyze data, and develop recommendations to solve the problem. I hope that the school district will look at the findings and review the recommendations in the white paper to help lessen the early literacy skills gaps students are entering school with and will disseminate the information to all stakeholders involved in the teaching of children.

This section focused on a reflective piece of my doctoral journey. I shared what I learned about scholarship, project development, leadership, and change. The reflective piece continued with thoughts regarding implications, applications and directions for possible future research. This part of the study invited me to look back on the past several years and realize that I have learned a great deal about being a scholar. This work that I have

completed has increased my knowledge regarding early childhood education and has given me the confidence to continue future research in that area.

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Appendix A: The Research Project White Paper

Research-Derived Recommendations for Addressing Kindergarten Reading Outcomes in A Local School District

By Terry Lynn Wood, Ed.D.

Executive Summary

I have written this white paper which includes a summary of findings from a quantitative study conducted using elementary schools' data in one Maine school district. In the report, an overview of the study's design, data collection, analysis, and findings revealed that during the school year, teachers provided adequate interventions embedded in the current research-based reading curriculum to significantly decrease pre-existing gaps in students who entered school with deficient reading readiness skills when compared to a reading-ready group in the same grade. Recommendations for pursuing continued improvements that result in positive social change in early literacy environments at the local, state, and national levels are presented. The white paper is a self-contained appendix in a more detailed doctoral study that can be provided upon request (Wood, 2019).

The Problem

This study focused on one local context of an increase of students entering school without the necessary reading readiness skills to be academically successful. The local district's educators assess the level of school readiness through the use of the DIAL-4 tool; Mardell & Goldenberg, 2011). Local educators reported that students are starting school without the necessary readiness skills based on the DIAL-4 taken prior to kindergarten. The DIAL-4 is a global screener that is used within the local community to assess children quickly and efficiently from two years six months (2:6) to five years 11 months (5:11) at two-month intervals. The chronological age of each student is used to measure his or her skill level to determine readiness/functional level status by skill set for kindergarten. The skills that the DIAL-4 measures include: (a) motor, (b) concepts, (c) language, (d) self-help,

and (e) social-emotional skills. Each skill is measured as a separate subtest on the instrument. Only the language portion of the DIAL-4 was used because the study was delimited to pre-K literacy.

The scores of the DIAL-4 were used to determine if students are entering school with a gap or without a gap in school readiness skills. The problem addressed by this study was that students were starting school without the necessary reading readiness skills based on the DIAL-4 taken prior to pre-K. As shown in Table A1, the percentage of students in this school district with gaps increased for the years 2014 through 2017.

Table A1

Students Entering Public Pre-K With Gaps

School Year	Number of students	Number of students with delays	Percentage
2014-2015	73	12	16.4
2015-2016	83	17	20.5
2016-2017	118	26	22.0

Note: Adapted from public data from administrators (December 12, 2017).

The Research Purpose

Researchers continue to reveal the importance of language, literacy, and experiences in early learners (Bassok & Galdo, 2016; Hunter, Elswick, Perkins, Heroux, & Harte, 2017). As many U.S. states have adopted the Common Core Standards, all students are expected to be able to attain the high standards in literacy (Robertson, Dougherty, Ford-Connors, & Paratore, 2014); however, this becomes an issue as research conducted by Hunter, et al.,

(2017) revealed that more than one third of children are entering school with delays in language as well as deficits in early literacy skills. Attainment of early literacy skills correlates to future reading achievement as evidenced through many research studies (Bingham, Culatta, & Hall-Kenyon, 2016; Duncan, et al., 2007; Schryer, Sloat, & Letourneau, 2015).

Data Analysis and Findings

The RBI pre and postassessment data from the 2016-2017 school year was used to examine the changes in the total test score from the subtest skills of, (a) readiness, (b) letter recognition, (d) phonological awareness, (e) listening, and (f) concepts of print over the course of their kindergarten year. Two groups of students were compared, those students entering kindergarten with a gap and those students entering school without a gap in terms of their reading readiness skills as assessed by their scores on the DIAL-4. These data in the form of pre and postassessment scores on the total test facilitated my research as I focused on answering the research questions posed in this study and whether students make the required gains during kindergarten.

Data were obtained from the partnering school district for the 127 kindergarten students from the 2016-2017 school year. The main requirement for participation was having the DIAL-4 rating, which served as the independent variable. Students were classified as with a gap or without a gap, based on their DIAL-4 scores. The dependent variable was the reading change score on the RBI between the beginning year reading test (pretest) and end of year reading test (posttest). The Statistical Package for the Social Sciences (SPSS) statistical analysis software was used for the data analysis. Once this

process was complete, there were only 26 students in the smallest of the two groups, the group with a gap, which left 92 students in the without a gap group. The independent samples *t* test assumes approximately normal distributions within the two groups and when this assumption is violated, the violation is compounded when samples are dramatically unequal in size (Kim, 2015). I used SPSS's random selection function to reduce the sample size for the without a gap group to make the group sizes more equal for the independent samples *t* test (Singh & Masuku, 2014). This process resulted in the two group sizes of 26 for the group with a gap and 26 for the without a gap group. The descriptive statistics for the two groups are presented in Table A2.

Table A2

Descriptive Statistics

DIAL-4 Designation	*N*	Mean	Standard Deviation	Std. Error Mean
Without a Gap	26	17.3846	9.19163	1.80263
With a Gap	26	28.2308	12.55168	2.46159

The 26 students who entered school without a gap had a mean of 17.38 (*SD* = 9.19) and the 26 students who entered school with a gap had a mean of 28.23 (*SD* = 12.55). The mean differences between the two sets of student data were compared using SPSS. Analysis was conducted using an independent samples *t* test using the change scores for the two groups of students, those who entered school with a gap and those who entered school without a gap. An independent samples *t* test was conducted to evaluate the change scores between the pre and postassessment scores of the RBI from the two independent student groups. The results of the *t* test evaluated whether the mean value of the change scores for

the two groups of students differed significantly. Table A3 presents the independent sample *t*-test results.

Table A3

Independent Samples Test

	Levene's Test for Equality of Variances		*t*-test for Equality of Means						
	F	Sig.	*t*	*df*	Sig. (2 tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	1.011	0.32	-3.555	50	0.001	-10.84615	3.05105	-16.97436	-4.71795
Equal variances not assumed			-3.555	45.825	0.001	-10.84615	3.05105	-16.98822	-4.70408

The independent samples *t* test was conducted to evaluate the null hypothesis that students who began school with a DIAL-4 readiness gap will not have the same change scores as students who entered school without a gap. The test was significant, $t(50) = -3.555$, $p = .001$, and therefore I rejected the null hypothesis that there is no significant difference on the change scores between both groups of students. One of the assumptions of the independent *t* test is that the standard deviations of the groups are equal. The Levene's Test for Equality of Variances indicated that the standard deviations were not significantly different so the homogeneity of variance assumption was satisfied for the *t* test conducted. The statistical test in this research used an alpha level of 0.05. Tests that produce a probability value of less than 0.05 suggest that the difference between the two groups of

students is greater than the difference expected due to chance. The 95% confidence interval of the difference in means ranged from -16.974 to -4.717.

The group of students with a gap averaged 9 points more in RBI score gains when compared to the without a gap group, perhaps indicating that the additional intervention measures taken with this group of students may have contributed to the significant difference in their fall-to-spring reading readiness progression. While the group with a gap started off 17 points behind the without a gap group at the beginning of the school year, the readiness gap had been reduced to only 8 points by school year's end. The findings of this study clearly indicate that there is a significant and positive correlation between the teaching of reading that occurs in these kindergarten classrooms and the achievement gains in students who enter school with a gap. While this research affirms current teaching efforts within the kindergarteners studied, the question remains as to whether there is anything more that should be done to reduce the literacy gap experienced by some pre-K students.

Recommendations

Recommendation 1: To continue reducing the reading achievement gap among early learners, the information in this project should be disseminated to let stakeholders know the good job their kindergarten teachers are doing with early learners. Some stakeholders include parents/guardians, teaching staff, administrators, and superintendents.

Recommendation 2: Conduct a similar study using the other components of the DIAL-4 assessment to see if the curricular in the other areas are making a similar significant difference. In review, the DIAL-4 components include (a) motor, (b) concepts, (c) language, (d) self-help, and (e) social-emotional skills.

Recommendation 3: Researchers have noted the positive effects of parental involvement in the formation of early literacy skills. Therefore, a recommendation would be to create and offer an early literacy training program for parents and guardians. In a study conducted by Niklas and Schneider (2015), families were presented information regarding the importance of providing a rich, home earning environments. These families also received an individual reading lesson to model linguistic competencies for early learners. The results concluded that the children who came from families that were involved in the training showed greater linguistic competencies. In a study conducted by Sim and Berthelsen (2014), parents were provided a training session on shared book reading for one hour. The parents were then given books and were asked to read to their children three times a week. The teachers also provided the parents with a laminated copy of reading strategies that had been discussed during the training session. The children in this study significantly improved their early reading readiness skills. In another study conducted by Colmar (2014), parents were provided training on how to implement simple intervention strategies. Pre and postlanguage scores were used to measure the effectiveness of the interventions. The students in this study also made significant gains in language skills.

Recommendation 4: Ensure that all new teachers are trained in the reading program so they can implement the current interventions embedded in the reading program with fidelity. Professional development for teachers regarding explicit reading intervention instruction needs to be ongoing and research-based. Literacy coaches and early interventionists can play a role in providing ongoing professional development based on the needs of the teacher (Liebfreund & Amendum, 2017). Furthermore, Foorman (2016) noted

that professional development in early language acquisition skills "fosters deep knowledge of and accountability for instructional routines and practices that are not typically part of teachers' repertoires" (p.10). The professional development could take place during the school year when there are early release days and scheduled professional development days on the calendar. The training could also take place during the new teacher orientation which is scheduled in the summer before school begins or the training could occur during the summer months.

Implications

The implications for providing struggling students with reading interventions are far-reaching in nature. Ramifications include long term effects for students who start school with gaps. Research conducted by Herman-Smith (2012) and Rabiner, Godwin, and Dodge (2016) revealed that students who fall behind academically are more likely to drop out of school and be involved in criminal activities. It is imperative to provide interventions as early as possible to increase the likelihood of student success. The research findings of this study should guide teachers to continue providing research-based interventions in the early school years to decrease the number of students starting kindergarten with deficiencies in reading readiness skills.

Conclusion

The local school district had a problem with students continuing to enter school without the necessary reading readiness skills to be academically successful in kindergarten. The research study found the students were able to reduce the gap, but they were not able to make the gains to close the gap. The goal of this project was to provide information that

directly relates to the effect early reading interventions have on students who enter school with a gap in early reading readiness skills. As the researcher, I sought to share my findings by comparing the change scores of students who began school with a gap and students who began school without a gap. The teachers used the embedded early reading interventions to significantly reduced the gap of the struggling students. The findings were analyzed and recommendations were shared to promote social change in the area of early reading readiness skills. These recommendations serve as important steps for continuing to focus on the importance of research-based curriculum and instructional interventions necessary to reduce the achievement gap in early readers in this local school district and to other neighboring school districts as well.

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The White Paper Formative Evaluation Questionnaire

If you read this white paper or attended a presentation of this project study, I encourage you to discuss the topic further with me and your other education colleagues. It would also be a tremendous help to me if you would respond to the following questions briefly and provide your answers to me by email or in person at your convenience.

Thank you.

Terry Lynn Wood, Ed.D.

1. What did you find to be the most interesting or surprising finding(s) from the research presented in this project?

2. What question(s) do you have that were not answered or need clarification after becoming more familiar with this project?

3. Share any significant or personal takeaways you gleaned from this project?

4. How beneficial do you believe this project will be for the stakeholders involved (i.e., students, parents, teachers, teaching staff, and administrators)?

5. On a scale of one to three, one being not helpful and three being very helpful, how would you rate this project in communicating the research effort?