KINDERGARTEN STUDENTS' READING PERFORMANCE AND PERCEPTIONS OF LUDUS READING: A MIXED-METHOD STUDY

by

Jessica D. Redcay

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Education in Educational Leadership, Curriculum and Instruction

University of Phoenix

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 - 1346

The Dissertation Committee for Jessica D. Redcay certifies approval of the following dissertation:

KINDERGARTEN STUDENTS' READING PERFORMANCE AND PERCEPTIONS OF LUDUS READING: A MIXED-METHOD STUDY

Committee:

Sean M. Preston, EdD, Chair

Leslie A. Miller, PhD, PHR, Committee Member

Marcia L. Nell, PhD, Committee Member

Sean M. Preston

Leslie A. Miller

Marcia L. Nell

Jeremy Moreland, PhD
Dean, School of Advanced Studies
University of Phoenix

Date Approved: July 22, 2014

ABSTRACT

The study used an embedded qualitative, historical, explanatory, case study design with a dominant quantitative, quasi-experimental pre-post, longitudinal, retrospective design. The purpose of the study was to determine the effectiveness of Ludus Reading -- a new reading program -- in terms of kindergarten students' reading perceptions and performance between the control and experimental group addressing the problem of illiteracy and aliteracy. Study participants included 73 kindergarten students. The results of the study were statistically significant (alpha = .05). The null hypothesis H1 was rejected (F (1,70)=15.01, p <. 001). Consequently, the experimental group had higher means on KDRA2 (M=9.25, SD=5.11) than the control group (M=5.07, SD=4.25). The null hypothesis H2 was rejected (F (1,69)=6268.69, *Wilks Lambda*=0.68, p<.001). Therefore, the experimental group had higher means on KDIBELS NWF-CLS (M=53.31, SD=21.51) than the control group (M=32.20, SD=18.99). The sub-null hypotheses were retained, signifying that moderating factors, gender and speech language services, did not influence the students' reading performance. Qualitative data from learning profiles were explored, and emerging themes indicated that the experimental group enjoyed reading more than the control group because students from the experimental group used more descriptive emotion words to describe reading, and expressed a higher intensity level of enjoyment.

DEDICATION

First and foremost, I would like to dedicate my dissertation to my loving and supportive family. My husband, Matt Redcay, stood by me through the difficult and joyous times of life. Thank you, Mom and Dad, Kathy and Joe Shoff Jr., for always believing in my potential and always being there for me. I would like to thank my brother and sister-in-law, Jeannie and Joe Shoff III, and I am confident, Joe, that we are both on the verge of achieving our dreams. I could never forget how generous and hospitable Anna Butler and Uncle Jim Erb were throughout my residencies. Thank you, Aunt Nancy Frey, for helping me through difficult times, and for reminding me to keep moving along because dreams do come true. Also, my dissertation is in loving memory of my grandparents, specifically Grammy Erb, for instilling a love of reading in me. Thank you to my family and friends for your prayers and support.

It is my prayer that my hard work will provide the best life possible for my two wonderful children, Sophie, 4 years old, and Davin, 1 year old. Sophie, always remember to give everything that you have to your dreams, and with hard work, your possibilities are endless. Throughout this journey, you reminded me that it is always important to stop and dance. I am so proud that you are my daughter. Never lose your playful, caring, loving spirit. Davin, you are a daredevil, and I hope that you always remember to "go all in." You are so curious about how everything works, and I hope you that you always continue to ask questions. Throughout the journey, you reminded me about how important it is to stop, cuddle, and read books together. I am so proud that you are my son. Never lose your curious, happy, and loving spirit. Sophie and Davin, please always enjoy life, and live it to the fullest!

ACKNOWLEDGEMENTS

I acknowledge that I had the honor of working with a dissertation committee of experts. I like to surround myself with the best people and I learn as much as I can from each one. My journey with Dr. Sean M. Preston, my chair, started at University of Phoenix's Year One Residency, and I hope that it is a relationship that will continue in the future. I learned invaluable lessons from my mentor. Dr. Leslie A. Miller, my committee member, and I met at University of Phoenix's Year Two Residency, and she has served as a methodology and editor expert on my panel. Her trained eye for detail has helped strengthen my knowledge and dissertation throughout the process. During my graduate work at Millersville University, Pennsylvania, I had the opportunity to learn from early childhood expert Dr. Marcia L. Nell, my committee member. Her expertise in my content area helped further my knowledge and dissertation. Also, I would like to acknowledge my supportive cadre that I developed throughout my doctoral process.

Additionally, I would like to thank Dr. Timothy Miller, Millersville University, for sharing his love of reading and writing with me. Dr. Miller helped expand my thinking and understanding of writing. I would like to acknowledge that the idea of "Ludus" emerged from Dr. Miller sharing Huizinga's *Homo Ludens: A Study of Play Element in Culture.* Huizinga (1950) described play as essential to human life. In Latin, ludus is play.

I would like to thank my supportive colleagues and administrators for their continued support. I am forever grateful for all of my teachers and professors who have contributed to my education, specifically Maria Poore. Mrs. Poore was my sixth grade teacher, and she taught me the importance of being a lifelong learner.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

Overview of Dissertation

> Why am I a teacher? The most significant reason why I teach is to help students develop a love of reading. I do not consider myself a schoolteacher, but rather a child teacher. I teach children, not content! Unfortunately, in a standards-driven era, many teachers are forced to focus on content. I teach what I have to teach, but I teach it in a developmentally-appropriate way. Primarily, I focus on what each individual child needs to grow and develop physically, socially, emotionally, and cognitively. When I was deciding on the direction for my dissertation, I knew that I wanted to focus on early literacy development, but, specifically, I wanted to focus on an area of personal passion. Everyday when I teach my kindergarten students, I strive to make learning enjoyable, and playful. I developed Ludus Reading, which combines reading, play, and technology, to find a way to help *every* student develop a love for reading by making reading instruction effective *and* fun!
>
> —Jessica D. Redcay

In a standards-driven era, early childhood classrooms lack a balance between reading instruction and play (Harris, Golinkoff, & Hirsh-Pasek, 2011; Jacobs & Crowley, 2007; Roskos & Christine, 2009; Schwartz & Copeland, 2010; Zigler & Bishop-Josef, 2004). Additionally, existing play-literacy research does not combine play-based literacy experiences with recent technology advancements (Sawyer & DeZutter, 2009; Smith, 2009). To address the need, the researcher for this study created a new reading program, Ludus Reading. The program combines reading, play, and technology. Ludus Reading

has two purposes: 1) to help young learners enjoy the experience of learning to read; and 2) to improve the reading performance of young children using developmentally-appropriate practices. Ludus Reading was implemented with two half-day kindergarten classes. Quantitative and qualitative data were archived; however, the data were not explored to determine the effectiveness of the new reading program. Therefore, the purpose of the mixed-method study was to use archived quantitative and qualitative data to explore the relationship of kindergarten students' reading perceptions and performance between one group who received Ludus reading and one group who did not receive Ludus Reading.

The dissertation consists of five chapters. Chapter 1 contains an overview of the research study. Chapter 2 includes a review of literature relevant to the study. Chapter 3 contains a detailed description of the method. Chapter 4 includes the results of the study, and Chapter 5 includes a discussion of the results. Chapter 1 starts with a description of the background information about the problem. Next, the problem statement and purpose statement are provided. An explanation of the significance of the study, and the scope and nature of the study are included. The theoretical framework follows the research questions and hypotheses. The research study's definitions, assumptions, limitation, and delimitations are included at the end of Chapter 1. The mixed-method study is described and developed throughout each section of Chapter 1. Further, the study's quantitative and qualitative components are described separately within each section. By the end of Chapter 1, it becomes increasingly clear, section-by-section, that separately, the quantitative and qualitative components of the research study were necessary and strong

individually. Thus, when the two methods were mixed, the research study was strengthened and the information yielded comprehensive results.

Background of the Problem

> Do you remember the moment you first learned to read? As a kindergarten teacher, I have the privilege of watching my students' magical moment of discovery when the words on a page transform into meaning for the first time. A new world of endless possibilities unfolds for the child. The child joyfully and excitedly delves into everything and anything they can find to read. The process of teaching my students to learn to read is complex, but teaching reading is also rewarding. By teaching children to read, I am able to empower them, and change their lives forever.
>
> —Jessica D. Redcay

The words used to describe the process of learning to read include magic, joy, endless possibilities, and excitement. Unfortunately, in a standards-driven era, new words used to describe the process of learning to read include testing, performance, outcomes, results, and failure (Armstrong, 2006). No Child Left Behind (NCLB) has caused educators to focus on academic discourse, as opposed to human development discourse. Regardless of attempts to reform reading education, children in America continue to struggle with reading (Armstrong). Further, some children can read, but they do not like to read.

In 1955, Rudolph Flesch published, "Why Johnny Can't Read," to address the crisis of illiterate Americans. Flesch (1955) identified that America needs to wake up and recognize the root cause of reading issues as a lack of phonics instruction in schools. In

1985, Jonathan Kozol published "Illiterate America," yet again identifying that Americans cannot read. Kozol (1985) begins the book with the following statement: "A third of the nation cannot read these words" (p. 19). In 1983, the National Commission on Excellence in Education proclaimed: "Our Nation is at Risk" (Kozol). In 2002, the NCLB Act sought to make schools more accountable for responding to "Our nation is at risk." The Reading First Initiative was a part of NCLB. The Reading First Initiative involved providing $1 billion a year to schools using programs to teach phonics instructions effectively (Toppo, 2008). From 2004 through 2006, a study involving 40,000 students showed that regardless of the amount of funding, the students did not improve in the area of reading, specifically in terms of phonics instruction (Toppo). In the United States today, 30 million adults read at a fifth grade reading level (ProLiteracy, 2013). Approximately 14.5% of American adults with low literacy skills are unemployed, and patients with low literacy skills have a 50% increased risk of hospitalization (ProLiteracy).

Research has demonstrated that a strong foundation of early literacy skills in kindergarten is correlated with adult literacy, increased academic achievement, reduced grade retention, higher graduation rates, and an enhanced productive life (Strickland & Riley-Ayers, 2013). When children do not acquire foundational phonics skills, then their reading performance worsens in the proceeding years (Strickland & Riley-Ayers). Quantitatively, the research problem addressed illiteracy; whereas, qualitatively the research problem addressed aliteracy. The research problem accounted for "Why Johnny Can't Read" and "Why Johnny Doesn't Like To Read." Illiteracy is a major problem in America; however, aliteracy is a problem in America that is not often addressed (Farm,

2007; Olufowobi & Makinde, 2010). Illiterate people have an inability to read. An alliterate person has the ability to read; however, the person lacks an interest or desire to read. Half of the American population who can read choose not to read (Farm). Further, Olufowobi and Makinde (2010) described how aliteracy is a problem in American schools: "In schools, students do not find reading and writing interesting and this affects their academic performance ... A large percentage of the teachers interviewed admitted that most of their students find reading and writing boring and difficult" (p. 825). Consequently, illiteracy and aliteracy are both problems in American schools.

Correlational research has demonstrated that letter and sound recognition are the best predictors of how well children will learn to read during the first two years of schooling (Strickland & Riley-Ayers, 2013). From kindergarten through sixth grade, acquiring phonics skills improves students' overall ability to read. Specifically, students become proficient readers when effective phonics instruction is provided in kindergarten (U.S. Department of Health and Human Services & National Institutes of Health, 2013).

Statement of the Problem

The general problem was that kindergarten students lack phonics skills, which are foundational for reading (Al Otaiba et al., 2011; Tyner, 2009). Kindergarten students' phonics skills predict the reading trajectory from first to fourth grade (Al Otaiba et al.). In the school district involved in the current study, 8% of third grade students read below grade level, and in the Commonwealth of Pennsylvania, 28% of third grade students read below grade level (Pennsylvania Department of Education, 2012). Sixty percent (253,000) of third graders in America are reading below grade level (U.S. Department of Education, Institute of Education Science, National Center for Education Statistics, &

National Assessment of Educational Progress, 2011). Therefore, in America, three out of five third graders are reading below grade level, signifying that the students are lacking foundational reading skills. Research suggested that when reading issues are identified and addressed as early as kindergarten, low reading performance can be modified or prevented (Berk, 2006; Coople & Bredekamp, 2009; Schickedanz, 2004; Simmons et al., 2011). The National Institute of Child and Human Development reported that more than 100 research studies have identified a correlation between a lack of phonics skills and children continuing to struggle with reading from first to fourth grades (Hempenstall, 2013)

The National Center for Education Statistics (2013) conducted "The Kindergarten Year Study," which involved analyzing the phonics abilities of 22,000 kindergarten. students in America, 33% of whom start kindergarten with a lack of phonics skills. If students who lack phonics skills do not receive proper instruction, then the percentage increases and contributes to 60% of third graders in America reading below grade level (U.S. Department of Education et al., 2011). The percentage continues to increase, resulting in 30 million adults reading at a fifth-grade reading level (ProLiteracy, 2013). Further, half of the American population who can read choose not to read because they find reading boring (Farm, 2007). So, in a class of 25 kindergarten students, 15 of the students will read below grade level by the end of third grade, and research indicated that if proper reading instruction was used, then 90-95% of the kindergarten students could have learned to read (National Center for Education Statistics). Essentially, if effective kindergarten reading instruction were used, then 24 out of 25 students would be able to

read on level by the end of third grade. Therefore, a better reading program could increase Americas' literate population student-by-student and classroom-by-classroom.

The specific problem was a lack of effective phonics instruction for kindergarten students (Gebeloff, Evans, & Scheinkman, 2012; Neuman, Copple, & Bredekamp, 2000; Tomlinson & McTighe, 2006). Based on a random sample completed by 1,500 U.S. state legislators, approximately two out of three felt existing reading curriculums were ineffective because the existing curriculum did not align with the reading assessments (Requtzel, Hollingsworth, & Cox, 2013). Ludus Reading is a new reading program. The current research study examined the effectiveness of Ludus Reading in improving students' reading performance -- specifically in the area of phonics instruction -- as well as their perceptions. The mixed-method research study involved using archived quantitative and qualitative data to examine Ludus Reading's effectiveness.

Purpose Statement

The purpose of the mixed-method study was to use archived quantitative and qualitative data to explore the differences of kindergarten students' reading performance and perceptions between the experimental group -- students who received Ludus Reading -- and control group --students who did not receive Ludus Reading. The researcher used an embedded qualitative, historical, explanatory, case study design with a dominant quantitative, quasi-experimental pre-post, longitudinal, retrospective design. Within a mixed method study, one method was dominant, and the other method assumed a supporting role (Creswell, 2008). An embedded explanatory design involved analyzing the dominant quantitative study first and then using the qualitative data to support and further explain the results (Museus, 2011). A mixed-method study was appropriate

because quantitative and qualitative data provided a more comprehensive overview of the program's effectiveness (Creswell, 2008). The archived quantitative and qualitative data had been collected previously collected, so it would not have been logical to choose to use one form of data and not the other. Together, both forms of data provided a better explanation of the program's effectiveness.

Quantitative component of the research study. The researcher used a dominant quantitative, quasi-experimental pre-post, longitudinal, retrospective design. A quasi-experimental pre-post design was used to analyze two groups that could not randomly be assigned within a classroom setting (Cook & Campbell, 1979). The retrospective component involved using archived data. The students' retention of skills was tracked from kindergarten to the beginning of first grade, supporting a longitudinal design. The quantitative data included Kindergarten and Grade 1 Dynamic Indicators of Basic Early Literacy Skills (DIBELS) scores, and Kindergarten and Grade 1 Developmental Reading Assessments, Second Edition (DRA2) scores. Archived scores on reading assessments -- KDRA2, KDIBELS, Grade1DRA2, and Grade1DIBELS -- for the 2011-2013 school years were analyzed to determine the effectiveness of the Ludus Reading program in terms of students' reading performance.

Qualitative component of the research study. The researcher used a qualitative, historical, explanatory, case study design. The qualitative component of the study was embedded because it involved exploring how students perceived the new program. Qualitative studies are used to explore how people made sense of their experiences (Rovai, Baker, & Ponton, 2013). Creswell (2008) used a case study to focus on how a group perceived a new program. Baxter and Jack (2008) conducted a case study, in which

historical data were used to describe an event that occurred within the context of interest. Learning profile data were collected and archived for the control and experimental groups; however, the data were not analyzed to compare the perception differences between the two groups. Therefore, the historical case study examined the historical data spanning from 2011-2013. The perception data from the kindergarten students' learning profiles were explored in order to determine the patterns between how students' perceived reading between the experimental and control groups. The triangulation of both quantitative and qualitative data yielded a deeper understanding of the problem (Creswell; Rovai et al.).

Significance of the Study

The current research study contributed to the field of literacy development because Ludus Reading was a new framework for teaching reading. Educational research studies are considered significant when results improve educational practice (McMillan et al., 2002). Ludus Reading involved combining play, reading, and technology. The study involved an exploration of Ludus Reading's effectiveness in terms of students' reading performance and perceptions with half-day kindergarten students. Other settings might consider using a new program shown to be effective. Therefore, the researcher provided a new way to instruct young learners how to read. Policymakers, teachers, principals, and educational leaders might consider using a new reading program that improves students' reading performance and perceptions. Educational research has become increasingly popular with politicians, and practical educational research is needed to help inform politician's decisions (McMillan et al.).

Significance of the Study to Educational Leadership

A need existed in doctoral programs to produce quality research grounded in research theory and practice (Bennis & O'Toole, 2005). The current research study was significant because the researcher used a theoretical research lens, but the research study was also practically applied to the field of reading instruction. Further, the research study was significant to educational leadership because the researcher used a theoretical leadership lens for the research study based on the Scholar, Practitioner, and Leadership (SPL) Model (University of Phoenix, 2013). The researcher acted as a thought leader in the field of reading instruction.

A thought leader leads change by establishing innovative ideas that help move thinking forward (Schnoebelen, 2009). The researcher created a new reading program, which, essentially, helped contribute something innovative or different to the field of reading instruction. Thought leaders are also referred to as change agents or visionaries (Schnoebelen). Change agents create new programs or interventions to help solve a problem (Lunenburg, 2010). Visionary leaders create intentional social innovations that transform traditional paradigms by creating strategies that diverge from the conventional methods (McLaughlin, 2001).

Therefore, the researcher expanded the horizons of the existing research studies and literature in the field of reading instruction. The researcher acted as a thought leader, change agent, and visionary in the area of reading instruction because the research study yielded results about the effectiveness of a new reading program in terms of improving students' reading performance and perceptions. Also, the researcher coined seven new terms in the field of literacy, including "Ludus Reading," "Play Technology," "E-Print

Concepts," "Interactive Technology," "Play-Based Literacy Centers," "Developmentally-Appropriate Technology Integration," and "Interactive-I" in I-VAKT strategies.

Scope of the Study

Quantitative component of the research study. The research study included four quantitative research questions. Sub-research questions were used to examine the moderating variables. Each research question had a supporting null (H_0) and alternative (H_a) hypothesis. After analyzing the data, the researcher either accepted or rejected the null hypotheses. If the null hypotheses were rejected, then the Ludus Reading program improved the reading performance of the experimental group. If the null hypotheses were accepted, then the Ludus Reading program did not improve the reading performance of the experimental group. Further, the research study contained one qualitative research question, which was used to explore students' perceptions of the new reading program.

Quantitative research questions and hypotheses.

RQ 1: What, if any, is the difference in the Post Kindergarten DRA2 (PostKDRA2) scores between the group receiving Ludus Reading and the group not receiving Ludus Reading?

$H1_0$: There is no difference in the PostKDRA2 scores between the group receiving Ludus Reading and the group not receiving Ludus Reading.

$H1_a$: There is a difference in the PostKDRA2 scores between the group receiving Ludus Reading and the group not receiving Ludus Reading.

RQ 1A: What, if any, is the difference in the PostKDRA2 scores between the control and experimental group in terms of the moderating variable of gender?

$H1A_0$: There is no difference in the PostKDRA2 scores between the control and experimental group in terms of the moderating variable of gender.

$H1A_a$: There is a difference in the PostKDRA2 scores between the control and experimental group in terms of the moderating variable of gender.

RQ1B: What, if any, is the difference in the PostKDRA2 scores between the control and experimental group in terms of the moderating variable of speech language services (SLS)?

$H1B_0$: There is no difference in the PostKDRA2 scores between the control and experimental group in terms of the moderating variable of SLS.

$H1B_a$: There is a difference in the PostKDRA2 scores between the control and experimental group in terms of the moderating variable of SLS.

RQ2: What, if any, is the difference in the Kindergarten Post DIBELS (PostKDIBELS) LNF and NWF-CLS scores between the group receiving Ludus Reading and the group not receiving Ludus Reading?

$H2_0$: There is no difference in the PostKDIBELS LNF and NWF-CLS scores between the group receiving Ludus Reading and the group not receiving Ludus Reading.

$H2_a$: There is a difference in the PostKDIBELS LNF and NWF-CLS scores between the group receiving Ludus Reading and the group not receiving Ludus Reading.

RQ2A: What, if any, is the difference in the PostKDIBELS LNF and NWF-CLS scores between the control and experimental group in terms of the moderating variable of gender?

$H2A_0$: There is no difference in the PostKDIBELS LNF and NWF-CLS scores between the control and experimental group in terms of the moderating variable of gender.

$H2A_a$: There is a difference in the PostKDIBELS LNF and NWF-CLS scores between the control and experimental group in terms of the moderating variable of gender.

RQ2B: What, if any, is the difference in the PostKDIBELS LNF and NWF-CLS between the control and experimental group in terms of the moderating variable of SLS?

$H2B_0$: There is no difference in the PostKDIBELS LNF and NWF-CLS scores between the control and experimental group in terms of the moderating variable of SLS.

$H2B_a$: There is a difference in the PostKDIBELS LNF and NWF-CLS scores between the control and experimental group in terms of the moderating variable of SLS.

RQ3: What, if any, is the difference in the First Grade DRA2 (Grade1DRA2) scores between the group receiving Ludus Reading and the group not receiving Ludus Reading?

$H3_0$: There is no difference in the Grade1DRA2 scores between the group receiving Ludus Reading and the group not receiving Ludus Reading.

$H3_a$: There is a difference in the Grade1DRA2 scores between the group receiving Ludus Reading and the group not receiving Ludus Reading.

RQ3A: What, if any, is the difference in the Grade1DRA2 scores between the control and experimental group in terms of the moderating variable of gender?

$H3A_0$: There is no difference in the Grade1DRA2 scores between the control and experimental group in terms of the moderating variable of gender.

$H3A_a$: There is a difference in the Grade1DRA2 scores between the control and experimental group in terms of the moderating variable of gender.

RQ3B: What, if any, is the difference in the Grade1DRA2 scores between the control and experimental group in terms of the moderating variable of SLS?

$H3B_0$: There is no difference in the Grade1DRA2 scores between the control and experimental group in terms of the moderating variable of SLS.

$H3B_a$: There is a difference in the Grade1DRA2 scores between the control and experimental group in terms of the moderating variable of SLS.

RQ4: What, if any, is the difference in the First Grade DIBELS (Grade1DIBELS) LNF and NWF-CLS scores between the group receiving Ludus Reading and the group not receiving Ludus Reading?

$H4_0$: There is no difference in the Grade1DIBELS LNF and NWF-CLS scores between the group receiving Ludus Reading and the group not receiving Ludus Reading.

$H4_a$: There is a difference in the Grade1DIBELS LNF and NWF-CLS scores between the group receiving Ludus Reading and the group not receiving Ludus Reading.

RQ4A: What, if any, is the difference in the Grade1DIBELS LNF and NWF-CLS between the control and experimental group in terms of the moderating variable of gender.

$H4A_0$: There is no difference in the Grade1DIBELS LNF and NWF-CLS scores between the control and experimental group in terms of the moderating variable of gender.

$H4A_a$: There is a difference in the Grade1DIBELS LNF and NWF-CLS scores between the control and experimental group in terms of the moderating variable of gender.

RQ4B: What, if any, is the difference in the Grade1DIBELS LNF and NWF-CLS between the control and experimental group in terms of the moderating variable of SLS?

$H4B_0$: There is no difference in the Grade1DIBELS LNF and NWF-CLS scores between the control and experimental group in terms of the moderating variable of SLS.

$H4B_a$: There is a difference in the Grade1DIBELS LNF and NWF-CLS scores between the control and experimental group in terms of the moderating variable of SLS.

Operational definitions of the model. The quantitative component of the mixed-method study involved testing null hypotheses to answer research questions (Rovai et al., 2013). The research study contained one independent variable with two levels, four dependent variables, two moderators, and three covariates. Hypothesis 1 (H1) and Hypothesis 2 (H2) were analyzed through two levels of independent variables (control

and experimental group) across dependent variables -- PostKDRA2, PostKDIBELS LNF, PostDIBELS NWF-CLS. The covariates -- PreKDRA2, PreKDIBELS LNF, and PreKDIBELS NWF-CLS -- controlled for the natural differences between the control and experimental groups. Additionally, the sub-hypotheses addressed the moderating variables of gender and SLS (see Figure 1).

Hypothesis 3 (H3) and Hypothesis 4 (H4) were analyzed through the two levels of independent variable -- control and experimental group -- across the dependent variables, Grade1DRA2, Grade1DIBELS LNF, Grade1DIBELS NWF-CLS. The covariates included PostKDRA2, PostDIBELS LNF, and PostDIBELS NWF-CLS. The covariates controlled for the natural differences between the two levels of the independent variables. The subhypotheses addressed the moderating variables of gender and SLS (see Figure 2).

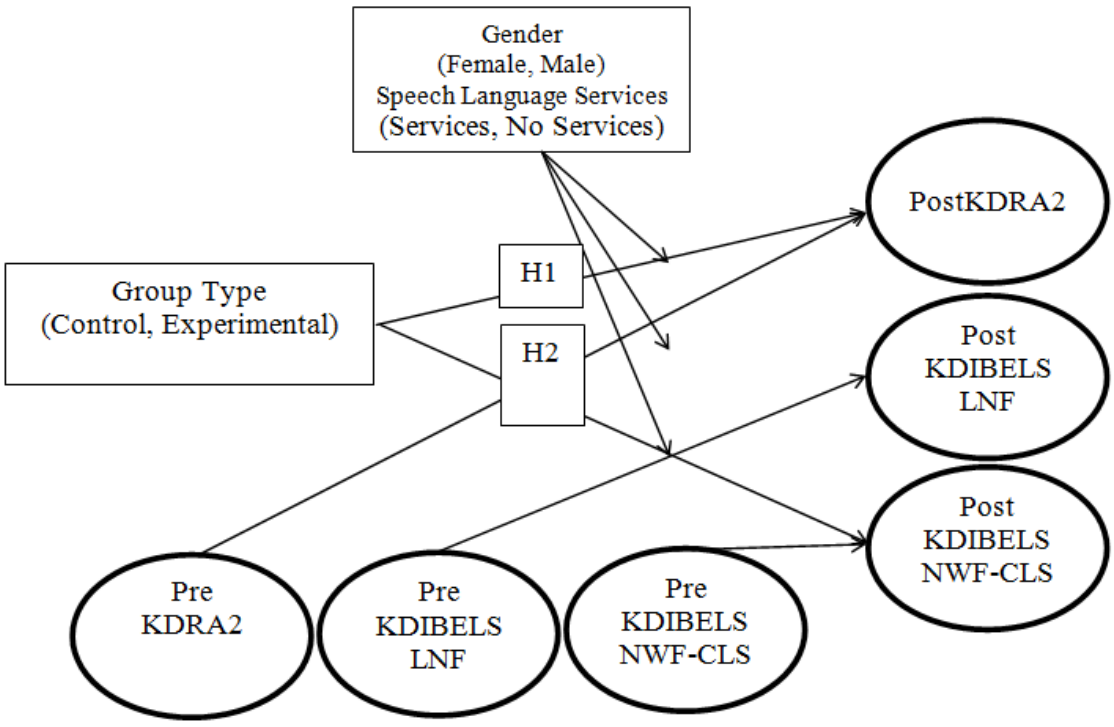


Figure 1. Operational model depicting the relationship between variables of interest for H1 and H2.

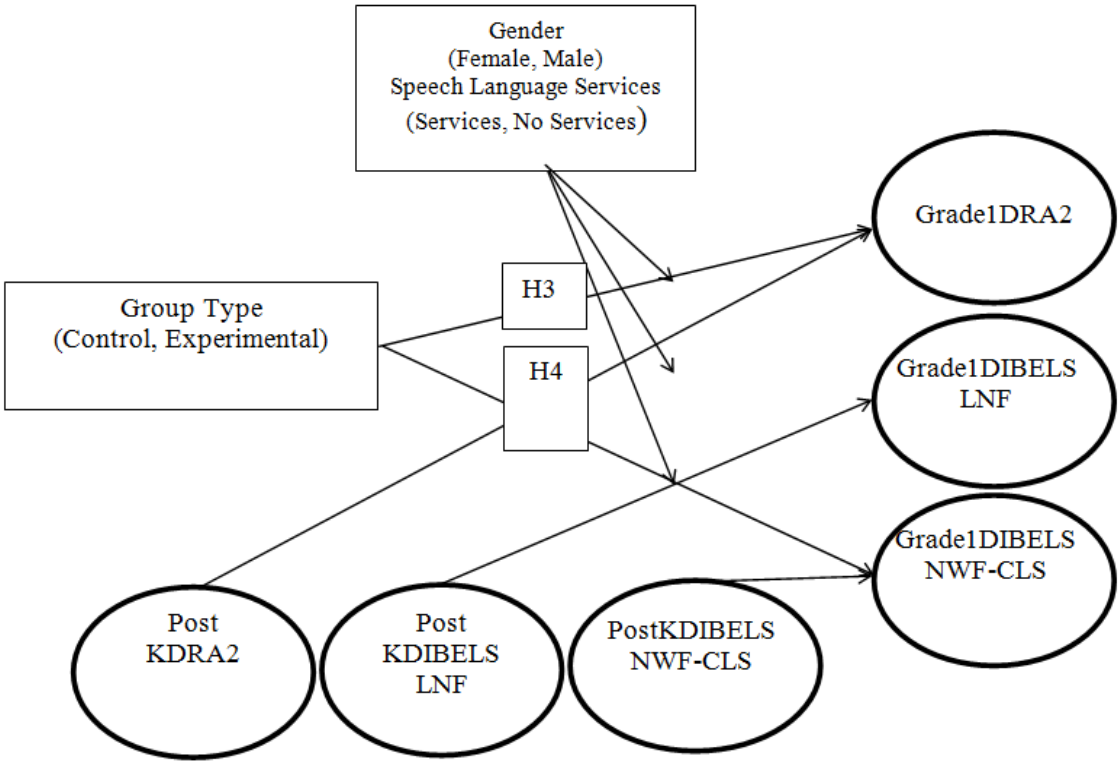


Figure 2. Operational model depicting the relationship between variables of interest for H3 and H4.

***Dependent variables*.** The dependent variables, the outcome variables, presumably change after the introduction of the independent variable (Sproull, 1995). The dependent variables for the current study included the students' reading performance on the DRA2 and DIBELS. The four dependent variables for the current study included (a) KDRA2 scores; (b) Grade1DRA2 scores; (c) KDIBELS scores; and (d) Grade1DIBELS scores. The researcher used two sub-constructs of the DIBELS: the Letter Naming Fluency (LNF) test, and the Nonsense Words Fluency (NWF)- Correct Letter Sound (CLS) test. Pre- and post-assessments results were analyzed for the KDIBELS NWF-CLS, KDIBELS LNF, and KDRA2.

Independent variable. The independent variable was the input or antecedent variable that was manipulated to presumably cause a change in the dependent variables (Sproull, 1995). The independent variable for the current study was the students' participation in Ludus Reading using a control-experimental design. The two levels of the independent variable included the control group and the experimental group. The control group consisted of students who attended the school district during the 2011-2012 school year, but did not receive Ludus Reading. The experimental group included kindergarten students who attended the school district during the 2012-2013 school year, but did receive Ludus Reading. Both the control and experimental groups had the same teacher, and the same core instruction. The control and experimental groups' reading scores were tracked into the beginning of first-grade.

Covariates. Covariates control for the natural differences between groups (Creswell, 2014). The covariates of a research study account for the differences in the dependent variables between the levels of the independent variables after controlling for the natural differences between students (Creswell).

The six covariates for the current research study included PreKDRA2, PreDIBELS LNF, PreDIBELS NWF-CLS, PostDRA2, PostDIBELS LNF, PostDIBELS NWF-CLS. The three covariates were administered to the control group -- students who did not receive Ludus Reading -- and experimental group -- students who did receive Ludus Reading. The three covariates controlled for natural differences that existed between the two groups of students.

Moderating variables. The moderating variables for the current study included gender, male and female, and students receiving services and students not receiving

services (SLS). A moderating variable is a factor that influenced the impact of the independent variable on the dependent variable (Olsen, 2004). The moderating variables were analyzed as a part of sub-questions for the research study.

Gender. Gender was a moderating variable that was analyzed within the research study. Gender was important to consider because research has demonstrated that males are weaker in reading than females. Further, the gap between males' and females' reading performance begins as early as kindergarten (Milteer et al., 2013; Stinnett, 2011). Male students perform lower in reading in grades 4, 8, and 12. Females outperform males in the areas of phonetic decoding, letter recognition, rhyming, sound recognition, and listening comprehension (Stinnett). Research suggested that boys perform better when teachers implement play-based instruction (Lillard et al., 2012; Milteer et al.). The researcher for the current study explored whether or not Ludus Reading helped the boys improve their reading performance, specifically in the area of phonics, because the program used play-based instruction.

Speech language support. Another moderating variable considered within the current study involved students receiving SLS. Previous research studies have shown that students receiving SLS are more likely to develop early reading delays (Gosse, Hoffman, & Invenizzi, 2012). In order for a student to receive SLS, then students must have an Individualized Education Plan Program (IEP) under the Individuals with Disabilities Education Act (IDEA). The student's IEP provides information about how often students receive SLS (Gosse et al.). Ludus Reading involves using visual-auditory-kinesthetic-tactile (VAKT) strategies (Stahl, 2003), so the students struggling with language might be successful with reading when using an alternative learning domain.

Quantitative design. In the quantitative component of the mixed-method study, the researcher used a quasi-experimental pre-post (see Figure 3), longitudinal, retrospective design. Therefore, the quantitative component of the study involved analyzing differences in the dependent variables, Pre and PostKDRA2, Pre and PostKDIBELS NWF-CLS and LNF, Grade1DRA2, and Grade1DIBELS NWF-CLS and Grade1DIBELS NWF-CLS and LNF, between the two levels of independent variables, control group students who did not receive Ludus Reading and experimental group students who did receive Ludus Reading. The experimental and control groups were tracked to the beginning of first grade and the students' Grade1DRA2 and Grade1DIBELS NWF-CLS and LNF were analyzed to determine the retention of skills over time. The moderating variables, gender and speech language services, were analyzed as sub-research questions.

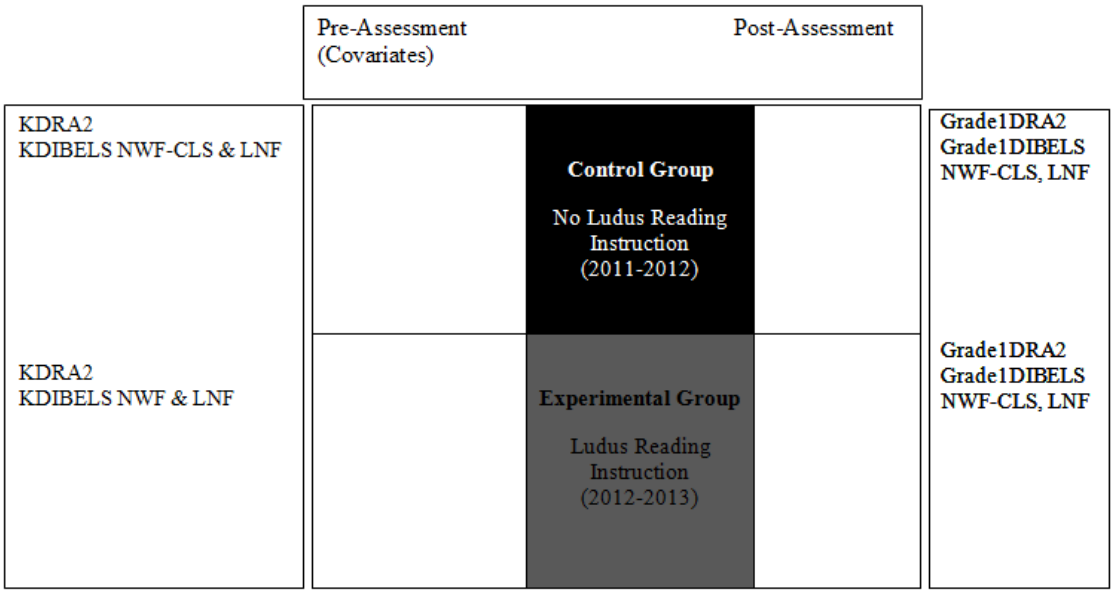


Figure 3. Quasi-experimental pre-post design depicting the pre and post assessments used for the control and experimental groups.

Qualitative component of the research study. The researcher for the current study used an embedded qualitative, historical, explanatory case study design to explore one research question: How do the kindergarten students' perceptions of reading compare between the control group and experimental group?

The qualitative component of the study was embedded because it involved exploring how students perceived the new program, and an emphasis was placed on performance, as opposed to perception. The qualitative study involved exploring how people made sense of their experiences (Rovai et al., 2013). A case study focused on how a group perceived a new program (Creswell, 2008). The historical component of the study involved the exploration of historical data spanning from 2011-2013. The perception data from the kindergarten students' learning profiles were explored in order to determine the patterns between how students perceived reading between the experimental and control group. The triangulation of both quantitative and qualitative data yielded a deeper understanding of the problem (Creswell; Rovai et al.).

Nature of the Study

Mixed-method studies are appropriate for social science research because they provide more information than a quantitative or qualitative approach would in isolation (Bennett & Harris, 2011). A qualitative method alone would have been limited because the study only would have included an exploration of students' perceptions, and a quantitative method alone would have been limited because the study would only have included an examination of students' performance. Together, qualitative and quantitative analyses provided deeper understandings about the research questions (Bennett &

Harris). Both archived quantitative and qualitative data were available and necessary for the current research study.

Creswell (2014) explained that quasi-experimental pre-post designs are appropriate for educational settings when examining the effectiveness of new instructional programs. In education settings, convenience samples are used because students cannot be randomly assigned to different groups. A quasi-experimental pre-post design was the strongest type of design to use in the current study when determining the effectiveness of a new reading program because the results were gathered before and after instruction and compared between the control and experimental group (Rovai et al., 2013). Further, the research design of the current study was strengthened because a supporting embedded qualitative design was used to expand upon the quantitative results (Creswell, 2008; Griffin & Musseus, 2011). An embedded qualitative, historical, explanatory case study design was appropriate for the current study because it involved describing the participants' experiences (Creswell, 2014). Separately, the quantitative and qualitative studies would have been strong, but by mixing the methods together, the current research study yielded richer information about the effectiveness of a new instructional program (Harper, 2011).

Data Analysis

The mixed-method study included an analysis of both quantitative and qualitative data to examine the effectiveness of the Ludus Reading program in terms of kindergarten students' reading perceptions and performance between the control and experimental groups. The quantitative data were analyzed using Analysis of Covariance (ANCOVA), Multivariate Analysis of Covariance (MANCOVA), and factorial Multivariate Analysis

of Covariance (MANCOVA) tests to examine four dependent variables (KDRA2, KDIBELS, Grade1DRA2, and Grade1DIBELS) between the independent variables (control and experimental groups). The ANCOVA, MANCOVA, and factorial MANCOVA were analyzed through a computer statistical software program called Statistical Package for the Social Sciences 20.0 (SPSS). The qualitative data were explored through thematic coding. A color-coded legend was established to represent emerging categories or themes.

Theoretical Framework

Mixed-method research studies have theoretical underpinnings in paradigmatic pragmatism. Paradigmatic pragmatists align with a balanced epistemology approach because reality is constructed upon an overall reality (Griffin & Musseus, 2011). Quantitative and qualitative researchers have different paradigms, and mixed methodologies involve intersecting both types of research to develop a richer understanding of the research question (Griffin & Musseus). Intersectionality is a new research paradigm that involves merging multiple positions and methodologies (Bennett & Harris, 2011). Therefore, the researcher for the current study used a paradigmatic pragmatist and intersectionality paradigm lens to conduct research in an attempt to gather a comprehensive understanding of the new Ludus Reading program by using quantitative and qualitative data.

Phonics instruction was a controversial and debated issue within the field of reading instruction (Reyhner, 2013). The great debate involved some reading specialists favoring phonics and some reading specialists favoring a whole language approach (Cunningham & Cunningham, 2002). Phonics instruction aligns with a behaviorist

theory, whereas whole language instruction aligns with a constructivist theory (Reyhner). Phonics instruction is a bottom-up reading program because students learn phonics skills before they read for meaning. The whole language approach is a top-down reading program because students start with the meaning and then learn about the implied or underlying phonics skills (Reyhner). The whole language approach involves children learning to read by seeing a word multiple times, whereas phonics instruction involves teaching students a set of skills that help them read words (Adamson, 2013). The whole language approach became popular in the 1980s and 1990s, and was implemented into schools without prior classroom testing (Adamson). The debate started to lessen when many reading specialists started supporting a balanced literacy approach, which takes into account the importance of teaching every area of reading instruction, including phonics (Wiles, Bondi, & Sowell, 2002). The classroom involved in the current research study used a balanced literacy approach.

Definition of Terms

Developmental Reading Assessment, second edition. Developmental Reading Assessment, Second Edition (DRA2) is a running record assessment. A running record provides an accuracy level of the student's oral reading by dividing the number of words read correctly by the total number of words in the passage (Cooper, Robinson, & Kiger, 2010). Teachers administer the DRA2 one-on-one (Beaver & Carter, 2005). The DRA2 results demonstrate students' overall abilities to apply phonics skills to reading (Strickland, 2006).

For the current research study, archived DRA2 scores were used to analyze kindergarten and first grade students' reading accuracy level. In kindergarten, DRA2 was

administered in January and June, and in first grade, the September DRA2 scores were used. The teacher administered, scored, and stored DRA2 results for students and results were member-checked by another reading specialist using a different running record assessment tool: Rigby Kit. The researcher used students' independent accuracy levels. Reading levels were based on a student's accuracy percentage, and kindergarten and first grade students' scores ranged between 0-16+. Zero was used to represent a DRA2 level A, demonstrating students have not yet started reading independently. Kindergarten and first grade students were considered below grade level with an accuracy level ranging between 0-2. Students were considered on grade level when reading at a level 3. Students were considered above grade level with a score ranging between 4 - 10.

Dynamic Indicators of Basic Early Literacy Skills. Dynamic Indicators of Basic Early Literacy Skills (DIBELS) is a standardized assessment tool used to monitor students' (kindergarten through third grade) progression in becoming a reader. The timed test measures early development and early reading skills that align with five main pillars of reading (comprehension, vocabulary, phonics, phonemic awareness, and fluency) and the Common Core State Standards (University of Oregon, 2012). A group of trained teachers and reading specialists meet with students one-on-one to administer DIBELS. The DIBELS test involves examining subset skills of phonics.

The researcher for the current study used two archived sub-constructs of the DIBELS: Letter Naming Fluency (LNF) and Nonsense Word Fluency (NWF)-Correct Letter Sounds (CLS). Nonsense words are made-up words in the form of a consonant-vowel-consonant, and vowel-consonant spelling pattern. Nonsense words demonstrate a student's ability to recognize letter sounds (University of Oregon, 2012). The researcher

for the current study used kindergarten DIBELS LNF and NWF-CLS scores from the fall and spring, and the first grade DIBELS LNF and NWF-CLS scores from the fall. The researcher used the DIBELS, sixth edition, end-of-the year benchmark recommended scoring guide. For the current research study, kindergarten and first grade students used the same grading criteria.

Students' raw scores were categorized in terms of the norms, including the percentile the student scored in comparison to other students across the country. The DIBELS LNF scores ranged between 0 - 40+. Students with a raw score of 0 - 28 were classified as below the norm because the score was within the 20th percentile of the norm across the country. Students with a raw score of 29 - 39 were classified as equivalent to the norm because the score was within the 20th - 40th percentile of the norm across the county. Students with a raw score of 40+ were classified above the norm because the score was within the 40th or higher percentile of the norm across the country. The DIBELS NWF-CLS scores ranged between 0 - 25+. Students with a raw score of 0 - 14 were classified below the norm because the score was within the 20th percentile of the norm across the country. Students with a raw score of 15 - 24 were classified equivalent to the norm because the score within the 20th - 40th percentile of the norm across the country. Students with a raw score of 25+ were classified above the norm because the score was within the 40th percentile of the norm across the country (University of Oregon, 2012).

Learning profiles. Learning profiles consist of stored information about students' learning preferences (Tice, 2008). A learning profile is a collection of notes about students' learning preferences and learning styles. Within a learning profile, the teacher

maintains anecdotal notes based on conversations or interest surveys, which are lists of questions or prompts used by the teacher to gather information about students' perceptions of learning.

Within the school district, every student has a learning profile. The teacher in the current study used a self-created interest survey as a part of each individual learning profile. The interest survey included a list of questions used to gather information about how students perceived reading at the end of the school year. Therefore, the students' perceptions of reading were recorded at the end of the school year, and the perception data were used to examine the perception differences between the experimental and control groups. The researcher for the current study examined the archived dictated students' responses to two questions: (a) How do you feel about reading? and (b) What was your favorite part of reading? The research study involved coding the students' responses to develop emerging themes used to describe the students' perceptions of the new Ludus Reading program.

Core instruction. Core instruction refers to the main classroom instruction that was provided to every student. The core instruction was consistent and used for both the control and experimental groups. Over 1,000 lesson plans were written and used with both groups involved in the research study to ensure the consistency of administering the same core instruction. Also, both groups were provided with the same amount of core instructional time. The core instruction included kid writing (Feldgus & Cardonick, 1999) and reading workshop, which involved the students self-selecting books and reading independently. Guided reading consisted of students receiving instruction in small groups based on individual reading levels (Bender & Shores, 2007; Tompkins, 2005).

Both groups received the same amount of phonics instruction, approximately 30 - 60 minutes a day. Nevertheless, the instructional method for each group was different. The control group received phonics instruction through Harcourt basal reading series and the experimental group received the same content using the Ludus Reading program. A basal reading program is a published textbook reading series (Cooper et al., 2010), whereas Ludus Reading is a new way to teach reading that involves differentiating the instruction by merging reading, play, and technology.

Ludus reading. Ludus Reading is a new approach to teach young learners to read by merging reading, technology, and play. The idea of "Ludus" emerged from Huizinga's *Homo Ludens: A Study of Play Element in Culture.* Huizinga (1950) described play as essential to human life. In Latin, ludus means play. Ludus Reading involves providing students with instruction that is differentiated based on their individual interests and ability levels. Interactive technology and Visual-Auditory-Kinesthetic-Tactile (I-VAKT) strategies are used to help students understand abstract reading concepts. Ludus Reading applies to the five main pillars of reading, which are phonemic awareness, phonics, fluency, vocabulary, and text comprehension (National Reading Panel Report, 2001) and Common Core State Standards. Since Ludus Reading was a new program, it was incomprehensible to measure the effectiveness of Ludus Reading in every area of reading. Consequently, the study researcher focused on one component of incorporating Ludus Reading into the area of phonics instruction.

Ludus Reading uses a play-based, differentiated instructional method, and developmentally-appropriate practices are embedded within the program. Students are instructed in various settings: whole class, one-on-one, and small flexible ability groups.

Students have the opportunity to work independently, and concepts taught in class are reinforced with differentiated homework assignments. The small, flexible groups are established based on ongoing assessments. Ludus Reading was developed based on neuroscience research, constructivist theory, emergent literacy theory, scaffolded instruction based on Vygotsky's Zone of Proximal Development, Orton-Gillingham's VAKT (visual-auditory-kinesthetic-tactile) strategies, and digital literacy. Further, Ludus Reading takes into account the importance of the whole child, and promotes cognitive and affective development.

Ludus Reading combines play, technology, and reading. Play is essential for young learners (Coople & Bredekamp, 2009; Dunn & Beach, 2009; Huizinga, 1950; Jacobs & Crowley, 2007; Middendorf, 2008; Milteer et al., 2013; Smith; Zigler & Bishop-Josef, 2004). Educational theory and research show that guided play yields superior retention of learning and academic achievement in young children (Harris et al., 2011; Jacobs & Crowley; Latvala, 2013). Regardless of the research, play is often removed from kindergarten because of the need for more time to prepare for mandated standardized tests (Harris et al.; Jacobs & Crowley; Milteer et al.; Zigler & Bishop-Josef). Unfortunately, many early childhood settings decreased or even eliminated play in order to cover more content (Milteer et al.; Zigler & Bishop-Josef). Play is replaced by lessons to prepare students for standardized tests, especially in the area of targeted literacy skills (Zigler & Bishop-Josef). In a standards-driven era, Ludus Reading attempts to put the joy and fun back into teaching young children to read.

Ludus Reading was implemented in kindergarten during phonics instruction time. The teacher started with an introduction lesson followed by a time for students to

manipulate and play with letters, sounds, and words. The introduction lesson and manipulation play time occurred as a whole class. The teacher had a binder with 180 documented introduction lessons that aligned with the Common Core State Standards. Based on ongoing assessments, the students were assigned to one of four color-coded ability groups. The students used differentiated learning play centers that corresponded with their assigned ability group. As students played individually with centers, the teacher met with and instructed small groups of students. The teacher had a binder with 280 differentiated, numbered lesson plans. The lessons were arranged in sequential order of difficulty. The teacher had a corresponding hanging-file folder with the materials to support the numbered lesson. The teacher would use different lessons based on the level for each group. For example, the highest group would be instructed using lesson 200, whereas the lowest group would be instructed using lesson 50.

Play-based literacy instruction. Ludus Reading is a play-based literacy program. Play-based learning is commonly used in early childhood classrooms because young children make sense of the world by engaging with people, objects, and representations (Barblett, 2010). The teacher plans a playful environment and lesson around a pre-determined goal. The play-based materials and play-based activities help the students develop an understanding of the learning objective through fun, playful learning opportunities (Barblett). Play-based learning is developmentally-appropriate for kindergarten students because students are able to learn at their own pace in a natural way (Oliver & Klugman, 2004). Play is the best way for students to learn how to read because play strengthens brain pathways (Barblett), and the reading pathway is developed in the brain as the language (speaking and listening) pathways strengthen (Sprenger, 2013).

Play-based learning opportunities are better than traditional teacher-directed activities because play helps children develop learning memories. Meaningful play opportunities allow children to make their own decisions, become intrinsically motivated, become immersed in the moment, discover that play is spontaneous and not scripted, and find that play is enjoyable (Nell & Drew, 2013).

Phonics instruction. "A knowledge of phonics is important because the English language writing system is based on the alphabetic principle-the principle that letters represent speech sound" (Fox, 2005, p. iii). There are 26 letters (graphemes) in the English language alphabet and 44 different phonemes (sounds) (Fox). The phonological system is used when students first learn to read. The students learn how to sound-out, or decode, words, using the phonological system. Phonics instruction involves matching phonemes and graphemes (Hiebert & Martin, 2003; National Reading Panel Report, 2001). Approximately 84% of English language words follow phonetic patterns (Blevins, 1998; Hiebert & Martin). With exposure to letter sounds and word work, students learn how to decode words with simple spelling patterns. An example of a basic word pattern would be a Consonant-Vowel-Consonant (CVC) pattern word. Twenty-one out of 26 letters in the alphabet are considered consonants: b, c, d, f, g, h, j, k, l, m, n, p, q, r, s, t, v, w, x, y, and z. The vowels are a, e, i, o, and u; and sometimes y (Blevins).

Research has indicated that students learn phonics best when the instruction is taught systematically and explicitly. Systematic instruction includes a selected set of letters and sounds organized into a logical sequence. Explicit instruction includes the teacher providing the students with direct instruction (National Reading Panel Report, 2001). Ludus Reading involves providing the students with systematic phonics

instruction because explicit instruction is used during an introduction lesson. During the whole class lessons, students had the opportunity to play with letters and manipulate sounds. Further, students had the opportunity to use differentiated learning centers that reinforce phonics skills, and students had the opportunity to meet with the teacher one-on-one or in small group instructional meetings. Students need to develop a strong understanding of phonics in order to decode words and read.

Assumptions of the Research Study

The research study was based on three main assumptions. First, the researcher assumed that safeguards were embedded within the study to help prevent possible research biases. The researcher was a kindergarten teacher with pre-existing opinions about reading instruction. The researcher created the new reading program, and implemented the instruction of the new program. The researcher established 1,000 lesson plans to ensure that both groups of students received consistent instruction, and ensured that both groups received the same amount of instructional time. The instructional plans were clearly documented, and during the time of the study, the teacher had a long-term substitute for 12 weeks because the teacher was on a Family Medical Leave of Absence (FMLA). However, it is assumed that the substitute teacher continued implementing the program based on the documented lesson plans.

Second, it was assumed that the researcher remained open to the fact that the Ludus Reading program might have been ineffective in increasing students' reading performance and perceptions. If the program was ineffective, then the researcher would discontinue using it or adjust the program appropriately. The researcher accurately and honestly reported the data of every student, regardless of the results. Data were only

excluded from the analysis if they were unavailable or missing because a student moved in or moved out during the time of the study.

Third, it is assumed that the study results can be generalized to other kindergarten classrooms, with certain limitations. In practical educational research studies, true experimental samples cannot be used because the research study occurs within a natural classroom setting (Creswell, 2008). Therefore, the researcher used a convenience sample of kindergarten students, and it was assumed that the sample could be generalized to all other kindergarten students within the United States, with certain limitations. The researcher did not use anything specific to Pennsylvania, rather the study involved using nationally normed DIBLES tests, and the program was based on the Common Core State Standards, which have been adopted by most states. Therefore, it was assumed that the research study results could be generalized to all kindergarten students in the United States, with certain limitations.

Limitations of the Research Study

Limitations of the study involved identifying possible threats to the internal validity of the research study. Internal validity refers to potential threats to the experimental procedures and participants, threats which may prevent cause-and-effect inferences (Creswell, 2008). One possible limitation of the study was that the control and experimental groups received the instruction and took the assessments during two different school years. In addition, both groups differed demographically. Therefore, the differences between the groups could have caused potential threats to the comparability between them.

Another possible limitation of the research study involved the maturation of the teacher and students. Maturation infers that individuals change during the experiment (Creswell, 2008). The teacher had one additional year of teaching experience when instructing the experimental group. Further, the participants matured naturally over the course of the school year.

A couple of potential limitations existed concerning the testing. A trained group of reading specialists and teachers gathered and archived the DIBELS test results. It was assumed that the assessment procedures were followed, and the results were reported in a uniform manner. Further, pre-service teachers collected the learning profile data. It was assumed that the pre-service teachers were consistent and accurate when gathering and reporting the results.

Three different types of archived data, DRA2, DIBELS, and learning profiles, were used in the current research study and each type of data had limitations. The DRA2 assessment included fluency comprehension and word analysis scores. Yet, the district did not administer the word analysis portion of the test, and the comprehension score did not align with the focus of the research study. The DIBELS includes several sub-tests, however, the researcher for the current study only used the two sub-constructs that aligned with focusing on phonics instruction.

During the 2011-2012 school year, the school district used DIBELS 6th edition, and during the 2012-2013 school year, the school district used DIBELS Next. Both versions of assessment were similar; however, the benchmarks or goals differed between the two versions. Therefore, for consistency purposes, the DIBELS 6th edition benchmarks were used for each school year. Further, the DRA2 and DIBELS had

different benchmarks based on different times of year. In order to make the comparison of data more consistent, the end-of-year kindergarten benchmarks were used, regardless of the time of year or grade level. The learning profile data only included two questions that pertained to reading, and kindergarten students do not always respond to prompts with elaborate answers. The answers could have been simplistic or off-topic, but regardless of whatever responses were given, the responses were reported and used by for the researcher.

The current study involved the use of a convenience sample, which could have caused potential threats to the study's external validity. Threats to external validity are potential threats to the selection, setting, and history of the treatment, which prevented the generalizability of the results (Creswell, 2008). The researcher used a convenience sample because the study being conducted was a social science research study. It was assumed that the research study results could be generalized to other settings, but with certain limitations.

Delimitations of the Research Study

Delimitations are safeguards established to address possible limitations of the research study. Three safeguards helped improve the comparability of the groups. The research study involved exploring and accounting for the moderating variables of gender and speech language services between the two groups. Additionally, the experimental and control groups' scores were tracked into the beginning of first grade. The two groups were more comparable because data were collected about the groups of student overtime (Hansen et al., 2011). Further, the covariates for the study involved analyzing the pre-tests to control for the natural differences between the two groups.

Using students from the same maturation level (same grade level) helped safeguard against the limitation (Creswell, 2008). The DRA2 scores were collected by the researcher, however, the researcher used a member-checking approach with two reading specialists ensuring accurate results. The reading specialists crosschecked the results using another running kit, the Rigby Kit. To ensure the validity of the data, the researcher compared three different forms of data to confirm the results. The triangulation of data sources involved directly comparing the different data sets to determine commonalities (Creswell).

It was assumed that the results of the study could be generalized to other settings, with certain limitations. However, naturalistic generalization or proximal similarity supports the ideas that the findings can be roughly generalized to a similar setting and people, promoting the external validity of the research study (Rovai et al., 2013). Therefore, the study included a detailed explanation of the setting for the research. The detailed description increased the naturalistic generalization of the study. Further, if the research study yielded results that the Ludus Reading program was effective, then future studies could replicate the study in other settings with differing groups of students.

Summary of Chapter 1

Chapter 1 provided an overview of the research study. The research study addressed the problem of a lack of effective phonics instruction for kindergarten students (Gebeloff et al., 2012; Neuman et al., 2000; Tomlinson & McTighe, 2006). The purpose of the mixed-method study was to use archived quantitative and qualitative data to explore the differences of kindergarten students' reading perceptions and performance between the control group (students who did not receive Ludus Reading) and the

experimental group (students who received Ludus Reading). The researcher used an embedded qualitative, historical, explanatory case study design with a dominant quantitative, quasi-experimental pre-post, longitudinal, retrospective design. A mixed-method study was appropriate because archived quantitative and qualitative data were available and necessary. Further, both types of data provided a more comprehensive overview of a program's effectiveness (Creswell, 2008).

The quantitative component of the research study used a quasi-experimental pre-post, longitudinal, retrospective research design. The quantitative design included two levels of independent variables: control group and experimental group. The four dependent variables included KDRA2, Grade1DRA2, KDIBELS LNF & NWF-CLS, and Grade1DIBELS LNF & NWF-CLS. The researcher for the current study used three covariates, PreKDRA2, PreKDIBELS NWF-CLS, and PreKDIBELS LNF, to control for the natural differences between the two groups. The control and experimental groups were tracked into the beginning of first grade, and Grade1DRA2, Grade1DIBELS NWF-CLS, and Grade2DIBELS LNF scores were analyzed to determine the retention of skills overtime. The moderating variables -- gender and speech language services -- were analyzed as sub-questions within the research study. The quantitative data were analyzed to determine the differences in the dependent variables between the control and experimental groups. Additionally, the researcher included an embedded qualitative, historical, explanatory case study design to explore students' reading perceptions based on the students' responses to two questions about reading in their archived learning profile. Chapter 2 will provide a review of literature relevant to the research study

Chapter 2

Review of Literature

> Why does the educational pendulum swing back and forth from one paradigm shift to another so often in the field of education? I would venture to suggest that in education, we stand on islands of pedagogy, unwilling to compromise. We need to find a common ground and develop a balanced approach to teaching. We have to look at both islands and realize that they are both important. Diverging pedagogy could help prevent distinct and frequent paradigm shifts.
>
> —Jessica D. Redcay

Some educators and policymakers completely focus on the cognitive domain of learning because academic achievement is important. Some educators completely focus on the need for young children to play because play is important. If cognition and play are both important, then why not merge the two? Additionally, educators have to take into account the need to adapt and evolve educational practices during the digital era. Ludus Reading is a new program that combines play, reading, and technology. Ludus Reading was implemented during the phonic instructional time with kindergarten students, however, the archived quantitative and qualitative data were not analyzed to determine the effectiveness of the Ludus Reading program.

Since the main components of Ludus Reading are technology, play, and reading, the literature review reported herein is organized around those areas. Ludus Reading was implemented during phonics instructional time within a half-day kindergarten classroom. Therefore, the reading section included herein is expanded into a discussion about phonics instruction. A section about kindergarten is included. First, the literature review

begins with an explanation of the searches utilized for the review of literature relevant to the study, and a description of the existing gaps in literature is provided. Next, an overview of Ludus Reading is provided. The literature review includes synthesized descriptions of the historical, theoretical framework of kindergarten, play, reading, and technology, in terms of Ludus Reading.

Title Searches, Articles, Research Documents, and Journals

Plenty of information and research literature is available about play-literacy, teaching reading, and using technology. However, at the time the current study was conducted, no studies analyzed kindergarten students' reading performance and perceptions based on the use of a new program, Ludus Reading, that combines technology, play, and reading instruction, specifically in terms of phonics instruction.

Key words and terms were used individually and in combination to conduct a literature search: *Guided play*, *literacy-based play*, *phonic instruction*, *emergent literacy*, *play and literacy*, *play and reading*, *play in kindergarten*, *reading in kindergarten*, *phonological awareness instruction in kindergarten*, *play-based curricula*, *play-based learning*, *play-based learning and reading performance*, *technology in kindergarten*, *play and technology*, *reading and standards in kindergarten*, *standards in kindergarten*, *No Child Left Behind Act (NCLB) and reading*, *technology and brain research*, *play and brain research*, *reading and brain research*, *developmentally appropriate practices in kindergarten*, *play-based learning centers*, *augmented reality technology*, *I-Pads in kindergarten*, *interactive whiteboards in kindergarten*, *Developmental Reading Assessment-2 (DRA2)*, *Dynamic Indicators of Basic Early Literacy Skills (DIBELS)*, and *reading motivation*.

The literature review included a synthesis of peer-reviewed journals spanning over the last five years from the University of Phoenix database, International Reading Association database, and National Association for the Education of Young Children database. Sources included EBSCOhost, ProQuest, Eric database, and Digital Dissertations. Also, information was drawn from more than 60 books. Key authors and pieces of literature pertinent to the field of reading instruction were included in the literature review, regardless of the date of publication. The reference lists of other sources were used to locate additional authors and articles. Tertiary sources were used sparingly; the majority of the sources included in the literature review are primary or secondary sources. Hence, only peer-reviewed journals and scholarly pieces of writing were included in the review of literature.

Existing Gaps in the Literature

The current research study added to the existing deficiencies in the literature about reading instruction (McMillan et. al., 2002). At the time the current research study was conducted, research was needed to determine whether playful literacy-based experiences resulted in kindergarten students' improved academic achievement and whether the children's improvement was retained overtime (Dunn & Beach, 2009; Roskos & Christine, 2009; Sawyer & DeZutter, 2009). The research study involved tracking kindergarten students' retention of skills as they progressed into the beginning of first grade.

Over the last decade, researchers have linked play and reading in the area of reading comprehension and vocabulary development (Dunn & Beach, 2009; Han, 2009; Rowe, 2009). A need existed for a research study to examine the effectiveness of a

program that combines play and phonics instruction. Previous research studies linking reading and technology had not yet taken into account how technology had influenced the direction of play-based literacy instruction (Sawyer & DeZutter, 2009; Smith, 2009; U.S. Department of Health and Human Services & National Institutes of Health, 2013). Therefore, the purpose of the current research study was to examine the effectiveness of Ludus Reading, which combines reading, play, and technology --specifically in the area of phonics.

Previous research studies examining play-based reading instruction were qualitative in nature (Dunn & Beach, 2009; Roskos & Christine, 2009; Sawyer & DeZutter, 2009; Smith, 2009). Therefore, the methodologies of previous research studies were limited because the data only explored the central phenomenon of research (Creswell, 2008). Quantitative data were needed to analyze the reading performance of students when play-based reading programs were used. However, the current research study was strengthened by including both quantitative and qualitative data. Mixed-method research designs are underused in educational research (Griffin & Musseus, 2011). Thus, the current study, a mixed-method study, furthered the existing body of knowledge in the area of reading research.

Ludus Reading

Ludus Reading developed from an accumulation of many different components that I implement in my kindergarten classroom. Current curriculum provides the same content to every student regardless of the fact that the content might be too hard or too easy for the student. So, in my classroom, I try to meet the need of every individual student. I address the Common Core State Standards, but in a

differentiated way. The students use differentiated centers, and they receive differentiated instruction and homework. I consider the components of Ludus Reading to be research-based and best practices for every student. I have always enjoyed putting a creative twist to my lessons to amuse my students and myself. Actually, it wasn't until I started working on my dissertation that I started putting everything together. Dr. Timothy Miller and I were conversing about my plans for my dissertation, and then he shared with me the book, *Homo Ludens: A Study of Play Element in Culture.* Dr. Miller has a contagious passion for learning and reading. He explained that this was one of the best books ever written about play. I couldn't wait to get home so I could start reading it, and he was right. As soon as I read the book, I knew that we needed a new way to teach reading. We needed to put the fun and joy back into learning to read. So, I coined the new program Ludus (play) Reading, after the inspirational book. It is amazing that a new reading program developed from one reader sharing a great book with another reader. The possibilities of reading are truly endless.

—Jessica D. Redcay

Ludus Reading is a new approach to teach young learners to read by merging reading, technology, and play. The idea of "Ludus" emerged from Huizinga's *Homo Ludens: A Study of Play Element in Culture.* Huizinga (1950) described play as essential to human life. In Latin, ludus is play. The researcher for the current study developed Ludus Reading during the digital era, and the era of NCLB. Technology is transforming the way that students learn, and in era of accountability, students are expected to perform better than ever. Ludus Reading incorporates interactive technology, such as, iPads,

interactive white boards, and 3-D augmented reality. The reading instruction focuses on five main pillars of reading, which are phonemic awareness, phonics, fluency, vocabulary, and text comprehension (National Reading Panel Report, 2001), and the Common Core State Standards. The reading instruction is differentiated based on students' needs and interests. Play is infused into the Ludus Reading instructional time because students have the opportunities to play with technology, differentiated learning centers, and other play-based materials. Further, students develop essential reading skills by using I-VAKT strategies (see Figure 4 for a model of Ludus Reading). As students play with differentiated learning centers, the teachers meets with small flexible groups and provides the students with target, differentiated lessons.

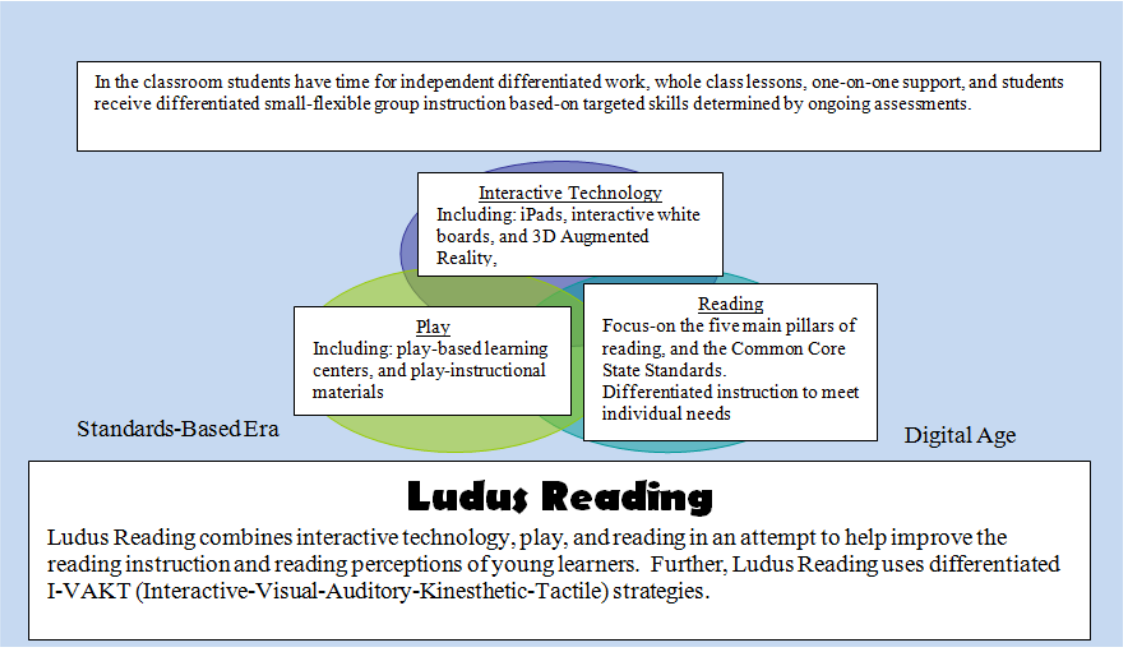


Figure 4. Model depicting the major components of Ludus Reading: technology, play, and reading.

Ludus Reading uses a play-based, differentiated instructional method, and developmentally-appropriate practices are embedded within the program. Students are

instructed in various settings: whole class, one-on-one, and small flexible ability groups. The small, flexible groups are established based on ongoing assessments. Ludus Reading was developed based on neuroscience research, constructivist theory, emergent literacy theory, scaffolded instruction based on Vygotsky's Zone of Proximal Development, Orton-Gillingham's VAKT strategies, and digital literacy. Further, Ludus Reading takes into account the importance of the whole child, and promotes cognitive and affective development.

Kindergarten

Kindergarten students participated in the current study, therefore, kindergarten was included in the literature review. The kindergarten section begins with a brief history of kindergarten. A description of the current kindergarten and changes in kindergarten is included. A description of kindergarten students, including information about how kindergarten students are explained by Piaget's preoperational stage of development, is given. At the end of the kindergarten section, the application of neuroscience, Developmentally Appropriate Practice, differentiated instruction, and Vygotsky's Zone of Proximal Development are provided. The application of Ludus Reading to kindergarten is transfused throughout Chapter 2.

History of kindergarten. Friedrich Froebel opened the first kindergarten in Germany in 1837 (Kostelnik & Grady, 2009; Roopnarine & Johnson, 2009). In the 1830s and 1840s, children were viewed as little adults who needed a stern handling. Regardless of Froebel's belief that children were naturally good and were active learners, in 1851, the government closed all kindergartens because of the radical ideas. At the end of the 19th century, kindergarten was reopened in Germany to serve children who were three to

six years of age (Kostelnik & Grady). “The word kindergarten means ‘garden of children’, a beautiful metaphor for what happens there children growing like flowers and plants, nurtured by a positive soil, rain, and sun, as well as an attentive gardener” (Passe, 2010, p. 42). By 1856, the first kindergarten in the U.S. was opened by Margaret Schurz. By 1914, all the major American school systems had publicly funded kindergartens open to five-year-olds (Kostelnik & Grady; Passe). Kindergarten has continued to evolve and change over the years.

Current kindergarten. Currently, kindergarten is a program for students ranging in age from four to seven years. Kindergarten serves as an introduction to school (Graue, 2006; Roopnarine & Johnson, 2009). Forty-three states require school districts to offer kindergarten. Nine of the states require full-day kindergarten. Seven states do not require school districts to offer any kindergarten. Fourteen states require age-eligible children to attend at least a half-day of kindergarten; of those, two states require children to attend full-day kindergarten (Roopnarine & Johnson). In Pennsylvania, the compulsory age to begin school is eight. In Pennsylvania, kindergarten is not mandated and attendance is not mandatory in kindergarten (Education Commission of the States, 2012).

The current study was conducted in the Commonwealth of Pennsylvania where kindergarten is not mandated and preschool is not a requirement. Therefore, some students start kindergarten with three years of preschool experience and some students do not have previous school experiences at all. In Pennsylvania, a kindergarten teacher has 50 students between the morning and afternoon sessions, without assistance from an aide. Further, kindergarten teachers in Pennsylvania have some students reading at a second-grade level, and other students who cannot yet write their name. Kindergarten teachers do

not have a previous grade level teacher to converse with, so the teachers have to uncover the background information about each student and family on their own.

Kindergarten students enrolled in a half-day program participated in the current study. Regardless of the shortened time and the amount of content to cover, teachers must try to make the most of every learning opportunity because when kindergarten teachers implement high-quality instruction, a student will learn in six months what a student in an average classroom will learn in a year (Williams, 2007). Further, if a student is in a least-effective classroom, then the same amount of learning will take place over the course of two years (Williams). Kindergarten teachers help students learn as much as possible in a meaningful way.

Changes in kindergarten. Students now learn in kindergarten what was previously taught in first grade (Latval, 2013; Schwartz & Copeland, 2010). The ripple effect of state testing and accountability has increased the pressure of the content covered in kindergarten classrooms (Passe, 2010). Many kindergarten teachers reported how difficult it is to teach so much content to young learners (Graue, 2006). Half-day kindergarten teachers experience a greater challenge because they are expected to cover more content in less time. Ludus Reading is a way for a kindergarten teachers to cover the required content, but in an appropriate and fun way for young learners.

Kindergarten students. Kindergarten students range in age between five and seven years. Five-, six-, and seven-year-olds are typically enthusiastic and curious about learning (Coople & Bredekamp, 2009). Further, research has documented many cognitive changes occur between the ages five and seven years, such as students begin to show more flexibility in thinking, longer attention spans, and better reasoning/problem-solving

skills (Berk, 2006; Coople & Bredekamp; Golbeck, 2006). By the age of six years, students typically have acquired 10,000 words. On average, kindergarten students learn about 20 new words every day (Berk; Coople & Bredekamp). Kindergarten students have a natural passion and curiosity. Therefore, the anticipation is that kindergarten students should enjoy learning to read in a playful and fun way.

Piaget's preoperational stage of development. Jean Piaget (1886-1980) was a constructivist and developmental theorist. Piaget's four stages of cognitive development included sensorimotor, preoperational, concrete operational, and formal operational (Tracey & Morrow, 2006). The current study focused on kindergarten students, who are categorized within Piaget's preoperational period, which occurs between ages two to seven years. During the preoperational stage, there is a rapid language development (Tracey & Morrow). Therefore, kindergarten is an effective time to develop early reading skills. Piaget's concept related to the idea that teachers need to provide students with reading experiences, and students need opportunities to manipulate materials to construct their own knowledge (Tompkins, 2005). Piaget's theory emphasized the importance of individual experiences (schema). Assimilation occurs when additional information is added to existing schema. Accommodations occurs when previous schema are modified or changed (Tompkins). Further, Piaget indicated that learning occurs through the state of establishing equilibrium. When a child does not know something, they are in a state of disequilibrium, which motivates the child to assimilate or accommodate the information to find a state of equilibrium again (Tompkins).

Neuroscience applied to kindergarten. Neuroscience applies the science of brain development research to education (Jensen, 2005). Neuroscience suggests that the

first five to seven years of life are a sensitive period of brain development (Berk, 2006; Coople & Bredekamp, 2009; Espinosa, 2010; Jacobs & Crowley, 2007; Passe, 2010). "The brain is more malleable than it will be later making kindergarten an optimum time for learning and effective intervention with all children" (Coople & Bredekamp, 2009, p. 200). Further, between preschool and kindergarten, the brain grows from 70% - 90% of the brain's adult weight (Berk; Coople & Bredekamp). Therefore, kindergarten is an optimal time to develop a strong learning foundation.

Further, neuroscience shows that neurons in the brain process and store information. Information is processed in a better way when the information is experienced through the senses (Hirsh-Pasek & Golinkoff 2003; Jensen, 2005). The connection between two neurons is called a synapse. Synapses, or connections, demonstrate learning in the brain (Hirsh-Pasek & Golinkoff; Jensen). When a student receives quality experiences in kindergarten, the student will have 1,000 trillion synapses by the end of kindergarten (Jacobs & Crowley, 2007). " … Kindergarten [is] an even more critical year in the life of a child, and one filled with potential to help children develop solid foundations for future learning" (Jacobs & Crowley, 2007, p. 2). Plasticity is the brain's ability to change with experiences. The brain can change for the better or for the worse. The brain has more plasticity during the early years of life, therefore, enriched early experiences can improve the brain development of a young child immediately and long-term (Espinosa, 2010; Jensen). The current research study focused on kindergarten students, and kindergarten is an important time in a child's development. Further, the effectiveness of Ludus Reading was examined in the current study because

the program involves attempting to provide kindergarten students with enriched learning experiences that promote learning.

Ludus Reading involves using play-based learning experiences. Brain research has demonstrated that children learn better when they play, which is an important component of early brain development because play provides the development of important neural pathways (Walcavich & Bauer, 2007). Therefore, brain research supports the use of play to teach young learners, and Ludus Reading uses play-based learning experiences with kindergarten students.

Additionally, Ludus Reading involves using technology, which influences how the brain works. Kindergarten students are considered Digital Natives because they have grown up never knowing what it was like to function without technology (Sprenger, 2010). Therefore, it is important to recognize what brain research says about the influences of technology on kindergarten students' brain development. Brain research explained that the reticular activating system (RAS) is a part of the brain that filters information. The RAS is associated with survival activities by scanning and filtering information allowed to enter the brain. The RAS filters 99% of the incoming information. Fast-paced technology overloads the brain, resulting in students' shortened attention spans, and when using technology, the students demonstrated an increased use of the RAS (Sprenger). When technology is used in the classroom, the students receive the information faster because the brain sends a message that information is novel or important. Ludus Reading takes into account the changes in technology and incorporates technology into the classroom.

Developmentally appropriate practices. "Developmentally Appropriate Practice should include intentional teaching of literacy in appropriate ways. The ability to read and write will develop with careful planning and instruction" (Morrow, 2004, p. 88). The National Association for the Education of Young Children (NAEYC) developed the idea of providing young children with Developmentally Appropriate Practices (DAP) (Coople & Bredekamp, 2009). DAPs contain four main components: 1) children are provided with instruction that is both challenging and achievable; 2) teachers use practices appropriate for the child's age, developmental status, and individual uniqueness; 3) instruction should challenge the child and promote progress and interest; and 4) teachers implement best practices as outlined by NAEYC's 12 principles (Coople & Bredekamp).

The key principles of DAP apply to Ludus Reading in five ways: 1) all domains of learning -- physical, social and emotional, and cognitive -- are important, and they are interrelated; 2) children learn in a variety of ways, and a wide range of teaching strategies must be used to support learning; 3) play is essential for developing self-regulation, promoting language, cognition, and social competence; 4) learning occurs when teachers scaffold the instruction to help the student achieve the level just beyond their current mastery level; and 5) positive learning experiences promote learning and development (Coople & Bredekamp, 2009). Ludus Reading involves implementing developmentally-appropriate reading instruction to kindergarten students by incorporating play and technology.

Few studies have examined how to implement practical DAPs into the classroom (Vukelich, 2004). "There is a desperate need for more and better research on how to prepare early childhood teachers who can make a difference - specifically a difference in

student achievement" (Vukelich, 2004, p. 98). Therefore, the current research study involved examining the effectiveness of implementing a developmentally-appropriate reading model, Ludus Reading, in increasing students' achievement.

Differentiated instruction. Teachers have classrooms filled with diverse learners (Boushey & Moser, 2009; Middendorf, 2008; Tomlinson & McTighe, 2006). Differentiated Instruction (DI) is an instructional method used to ensure learning for *everyone* in the classroom. Differentiated or responsive teaching involves the teacher recognizing the needs of the students and planning intentional lessons to address those needs (Middendorf; Tomlinson & McTighe; Watts-Taffe et al., 2012). Teachers can differentiate instruction based on student readiness. Students learn best when the task is neither too hard nor too easy. Students learn more when the instruction is scaffolded based on individual instructional levels (Boushey & Moser; Middendorf; Tomlinson & McTighe). Ludus Reading involves the use of ongoing assessment data collection to help group students together based on their ability levels. Students are placed into one of four groups that are color-coded blue (highest), green (high-average), yellow (low-average), and red (lowest).

In addition, to differentiae the instruction based on ability, teachers can differentiate based on differing modalities and interests. The different modalities of learning include visual, auditory, tactile, and kinesthetic (Middendorf, 2008). Ludus Reading involves differentiating the play centers based on students differing abilities and modality preferences. Students select color-coded centers that target specific differentiated skill sets.

Vygotsky's zone of proximal development. Quality instruction is intentional and is differentiated to meet the needs of every diverse learner (Kostelnik & Grady, 2009). Differentiation has theoretical roots in the work of Vygotsky (1896-1934), who was a social constructivist (Tompkins, 2005; Tracey & Morrow, 2006). Vygotsky proposed the idea of the Zone of Proximal Development (ZPD), referring to idea that the task should be neither too difficult nor too easy. Rather, the task needs to be one that the learner can complete with support from an adult (Tracey & Morrow). Vygotsky referred to the supports that a teacher provides to a student as scaffolding. Vygotsky draws on the analogy that scaffolding is used for building and removed after the work is completed. Teachers provide scaffolding and remove the scaffolding after the students do not need the support any longer (Tompkins; Tracey & Morrow). Hence, the Ludus Reading program is based on a constructivist theory because the program involves differentiating and scaffolding the instruction to meet the individual needs of students as students interact and use play-based centers and technology.

Application of kindergarten to the research study. Kindergarten has evolved and changed over time. Currently, kindergarten students are expected to master what was previously taught in first grade. Further, the research study was conducted in the state of Pennsylvania, where kindergarten is not mandated. The students were in a half-day kindergarten program, so the teacher had less time to cover the required content. Regardless, kindergarten is a critical time and kindergarten teachers must make the most of every learning opportunity. Teachers have the potential to influence their students' learning drastically. Ludus Reading uses play-based and technology-based reading instruction to help spark the interest and curiosity of kindergarten students. Additionally,

Ludus Reading attempts to incorporate DAPs by providing students with joyful learning opportunities. Further, Ludus Reading involves differentiating and scaffolding the instruction, as well as centers to meet the individual needs of the kindergarten students.

Reading

Ludus Reading applies to the cognitive area of reading. The program was developed during the No Child Left Behind (NCLB) era, so NCLB and the Common Core State Standards (CCSS) apply to Ludus Reading. Reading is a complex process. Ludus Reading was implemented into a classroom that used a balanced literacy approach. Ludus Reading is rooted in the ideas of emergent literacy. One of the five pillars of reading is phonics. For the purposes of the current research study, Ludus Reading was applied to phonics instruction. Ludus Reading involves implementing I-VAKT strategies. The I was added to VAKT to represent the importance of the learner, and the importance of the learner before strategies, and to focus on the importance of students interacting throughout the lesson.

Cognition. Learners develop physically, socially and emotionally, and cognitively (Copple & Bredekamp, 2009; Passe, 2010; Strickland, 2004). Every learning domain is important, however, the quantitative aspect of the current study focused on the cognitive domain. The word "cognition" comes from the Latin word for thinking or thought processes; thus, cognitive skills are skills for thinking (Golbeck, 2006). Teachers must develop basic cognitive skills in the core academic disciplines, such as math, language arts and literacy, social studies, and science (Golbeck). Ludus Reading focuses on reading instruction, therefore, the program emphasizes the cognitive domain of learning.

No Child Left Behind act. Ludus Reading emerged during the era of accountability. In 2002, President George W. Bush signed into law No Child Left Behind (NCLB). The law mandated standards-based education (Vacca & Vacca, 2008). One aspect of NCLB involves students taking tests in reading and mathematics. In 2007, science was tested, as well. All students are expected to reach 100% proficiency in every area by 2014. If schools do not reach 100% proficiency, then schools fail. Schools that fail have penalties, including students having the right to transfer to other schools (Armstrong, 2006). With the increase of standards, kindergarten teachers have more content to cover to prepare for tests and less time for the children to play. Subsequently, Ludus Reading was developed to help address the problem by developing a balance between play and reading instruction.

Common Core State Standards. Previously, individual states had established different state standards based on the national standards. However, now 90% of the states have agreed to use the Common Core State Standards (CCSS) (McLaughlin & Overturf, 2012), so consistent standards are implemented across the states. The current research study was conducted in Pennsylvania, which adopted the CCCS beginning in the 2013-2014 school year. However, schools started using the CCSS before the official mandate. The Council of Chief State School Officers [CCSSO] & National Governs Association Center for Best Practice [NGACBP] (2010) developed The Common Core State Standards (Core Standards). The Core Standards are the expectations for student knowledge and skills, from kindergarten through 12th grade. The CCSS provided learning expectations for English language arts and mathematics *consistently* across America

(National Association for the Education of Young Children [NAEYC], 2012; Snow, 2012).

The CCSS were developed from College and Career Readiness Anchor Standards because the goal of the CCSS is to prepare students to succeed in college and in the workplace (McLaughlin & Overturf, 2012; Snow, 2012). The NAEYC (2012) explained that early childhood experts were not consulted during the creation of the CCSS, and the standards were pushed down to kindergarten after the older students were considered. Regardless, NAEYC (2012) explained that the CCSS provided the "what" or content of education, but early childhood educators have the freedom in the "how" or instruction.

The CCSS are the expectations for what every student should be able to do in the core academic areas. The four language arts areas of the CCSS are listening, speaking, reading, and writing (CCSSO & NGACBP). Strickland (2006) explained that the four identified areas of language arts are interrelated. The researcher for the current study focused on the area of reading, but the other areas were integrated throughout the program, as well. The CCSS were used to guide the content during reading instruction time in kindergarten.

The CCSS are broken down by grade level. Still, the standards are broad and do not include a direction for how to teach the standards (McLaughlin & Overturf, 2012). Ludus Reading focuses on using the CCSS associated with phonic-based instruction: 1) the CCSS Standard 1.1.K.B.: Students will employ word recognition techniques by using knowledge of letter sound correspondence (alphabetic principle) to decode words in context; and 2) the CCSS Standards 1.1.K.E.: Students will demonstrate accuracy and automaticity in letter naming, letter-sound correspondence, and blending – decoding--

simple words. Therefore, the research study content was derived from the CCSS for kindergarten (CCSSO & NGACBP, 2010). Further, Ludus Reading uses 500 differentiated lesson plans and each lesson plan aligns directly with the CCSS for English Language Arts.

Knows, understands, and do's. Differentiation helps more students reach the state's established goals and standards (Heacox, 2009). Not every student in the classroom is ready to meet an established standard and for some students, the established standard is too easy. Therefore, Ludus Reading involves differentiating the instruction to help every student reach the CCSS for kindergarten. Breaking down the standards into Knows, Understands, and Do's (KUDo's) (Heacox). "Knows" represent what facts students need to know. "Understands" represent what generalization or big ideas students need to understand. "Do's" represent what the students will do by the end of the lesson. Each lesson plan for Ludus Reading includes the CCSS and KUDo's. Ludus Reading provides the teacher with 180 whole-class lesson plans, and then the teacher has a binder of 320 differentiated lessons used to instruct students during small group instruction. Each lesson is numbered progressively higher based on literacy skills difficulty level. The classroom teacher uses a different lesson number based on the needs of each ability group. For example, the teacher might be instructing the blue (highest) group using Lesson Number 140, whereas the teacher might be instructing the red (lowest) group with Lesson Number 1.

Reading process. Reading is a complex process. Scarborough (2003) described reading as a rope with major strands -- background knowledge, vocabulary, language structures, verbal reasoning, literacy knowledge, phonological awareness, decoding, and

sight recognition -- that are woven together. Each strand is essential for becoming a skilled reader. Each component is important when learning to read, however, phonics – decoding -- skills are the best early predictor of later reading performance (Scarborough). Therefore, the researcher for the current study focused on phonics instruction because phonics is a critical, foundational cornerstone of reading for kindergarten students.

Reading is a process in which the reader creates meaning based on the interpretation of the text. The meaning is interpreted by the reader's background knowledge of the topic or schema, the reader's purpose, and the reader's understanding of the vocabulary and words (Tompkins, 2005). Early reading occurs through four processing schematics: context processor (interpretation), sematic processor (meaning), orthographic processor (letters and spelling), and phonological processors (speech sounds). When phonics or decoding skills are strengthened, the students develop a faster understanding of reading, and the four processing schematics work together (Adams, 2003). The researcher for the current study focused on the effectiveness of Ludus Reading when applied to the area of phonics instruction, which is one critical aspect of the complex reading process.

Balanced literacy approach. Teachers have five main ways of teaching reading, including shared, guided, independent, buddy, and reading aloud (Tompkins, 2005). When a teacher implements all five reading instructional practices in the classroom, the teacher is implementing a balanced literacy approach (Richardson, 2009). Strickland (2006) explained that in kindergarten, a balanced literacy approach is an effective instructional method. Teachers must use a wide repertoire of teaching strategies, or methods (Heroman & Copple, 2006). The classroom framework, in which the current

research study was conducted, used a balanced literacy approach. The students in the classroom engaged in daily shared, guided, independent, buddy, and read alouds. Further, the students engaged in kid writing and shared writing activities. Writing is another key aspect of literacy development, but a writing program already existed that takes into account the importance of children playing with writing: Kid Writing (Feldgus & Cardonick, 1999). Therefore, the current research study continued to use Kid Writing, but focused on merging play and reading instruction.

Emergent literacy. Specifically, the researcher for the current study focused on developing emergent literacy skills. In 1966, Marie Clay was credited for coining the term "emergent literacy" (Jones, 2012; Tracey & Morrow, 2006). The term refers to the belief that children develop in the areas of listening, speaking, reading, and writing, starting at birth. Young learners continue to emerge or develop as readers until third grade (Koralek, 2002; Neuman et al., 2000; Tracey & Morrow; Whitehurst & Lonigan, 2003). Young learners construct their understanding by actively participating in literacy-based activities (Jones). Ludus Reading involves the students actively participating in activities that help develop phonics skills.

Emergent literacy theory differs drastically from the maturation theory. Previously, the maturation theory suggested that children should not read until the age of 6.5 years. In addition, children were required to meet a set of "readiness" criteria before reading (Tracey & Morrow, 2006; Whitehurst & Lonigan, 2003). However, from an emergent literacy standpoint, starting at birth, children need to begin developing early literacy skills (Strickland, 2006; Whitehurst & Lonigan). Early literacy skills involve young learners recognizing that print carries a meaning. Additionally, early literacy skills

involve developing a concept about the alphabet. Students need to recognize the letter names, and match graphemes, letters, and phonemes, sounds (Whitehurst & Lonigan). The current research study involved analyzing the effectiveness of an emergent literacy program -- Ludus Reading.

Five pillars of reading. The five main pillars of reading instruction for grades kindergarten through third include phonemic awareness, phonics, fluency, vocabulary, and text comprehension (National Reading Panel Report, 2001). Phonics instruction involves matching phonemes or sounds and graphemes or letters (National Reading Panel Report). There are 26 letters, graphemes, in the English language alphabet and 44 different phonemes, sounds (Tompkins, 2005). The phonological system is used when students first learn to read. The students learn how to sound-out, or decode, words, using the phonological system. Approximately 84% of English language words follow phonetic patterns (Blevins, 1998). Even though all five pillars of reading are important, for the purposes of the current research study, the effectiveness of the Ludus Reading program was examined in terms of the program's application to phonics instruction.

History of phonics. Phonics instruction helps readers understand the foundational concepts of the complex English language. At the end of the 6th century, the English language emerged as the early Anglo-Saxons changed their Germanic-based language and adopted the Roman alphabet (Fox, 2005). Subsequently, the English language is comprised of 26 written letters to represent approximately 44 sounds. The additional sounds are created by combining letters, using letter patters, or using one letter to represent more than one sound (Fox). Phonics instruction helps readers decipher the basics of the English language.

Definition of phonics. "Phonics is the relationship among the letters of our alphabetic writing system and the sounds in spoken words, as well as approaches for teaching these relationships" (Fox, 2005, p. 8). As described in the previous quote, phonics instruction involves teaching children how to decode words, whereas phonological awareness involves the ability to reflect on the spoken language (Stahl, 2003). Ludus Reading was implemented during phonics instruction time, as opposed to phonological awareness instruction. Phonics is an essential basic early literacy skill. Phonics involves the ability to recognize printed letters or graphemes and units of sounds or phonemes (Stahl; Whitehurst & Lonigan, 2003). The earliest stage of reading involves a child applying the alphabetic writing system to decode letters with corresponding sounds (Stahl; Whitehurst & Lonigan). Phonics skills are also referred to as the alphabetic principle, grapho-phonemic relationship, letter-sound association, letter-sound correspondences, sound-symbol correspondence, or sound-spelling (Bear, Invernizzi, Templeton, & Johnston, 2008; National Reading Panel Report, 2001). All the words refer to the idea that children must understand "…that there are systematic and predictable relationship between written letters and spoken sounds" (National Reading Panel Report, 2001, p. 12). Regardless of what term is used to describe phonics, Ludus Reading focuses on developing kindergarten students' understanding of letters, sounds, and the relationship between letters and sounds.

Alphabet knowledge. The National Early Literacy Panel [NELP] (2002) defined alphabet knowledge as knowledge of names and sounds associated with the printed letter. Furthermore, NELP identified alphabet knowledge as one of the strongest predictors of later literacy outcomes. Alphabet knowledge involves a child's ability to identify letters

by shape, identify letters by name, identify letters by sound, print letters, and rapidly name letters in a random sequence (Flora, 2011). Simply put, "Alphabet knowledge may sound like a simple concept, but it is an extremely important part of a young child's literacy development … Children cannot learn to read words without a solid knowledge of the alphabet" (Flora, 2011, p. 7). Ludus Reading focuses on developing kindergarten students' alphabet knowledge because alphabet knowledge is a foundational reading skill.

Phonics skills supporting later academic success. Research demonstrated that young children's alphabet knowledge and phonics skills are significant predicators of later proficiency in reading and writing (Adams, 2003; Coople & Bredekamp, 2009; Goswami, 2003; National Reading Panel Report. 2001; Stahl, 2003). Specifically, kindergarten students who developed strong phonics skills later demonstrated higher reading achievement by grade 3 (Schickendanz, 2004). Research demonstrated that children with a strong foundation of phonics skills read sooner and better, as compared to children with fewer of these skills (Adams; Whitehurst & Lonigan). Further, research has demonstrated a correlation between poor phonics skills and later overall poor reading skills (Adams; Whitehurst & Lonigan). Specifically, research has demonstrated that a correlation exists between readers being able to comprehend what they read and the readers' phonics skill set (Fox, 2005). Additional studies link phonics skills with word identification, the ability to spell, and the ability to read independently (Armbruster, Lehr, & Osborn, 2001). Flora (2011) explained that one in five school-age children start out a poor reader (lacking basic phonics skills), and those students remain poor readers for the rest of their lives. Research studies have demonstrated that phonics increases the achievement of struggling readers, and further phonics instruction helps prevent reading

problems of students considered at risk (Fox). Therefore, phonics is a key foundational early literacy skill for kindergarten students.

I-VAKT strategies. Ludus Reading was implemented during phonics instruction time. Ludus Reading includes an introduction whole-class lesson, and the remaining lessons springboard from the Orton-Gillingham Approach to teaching phonics. The Orton-Gillingham Approach involves the direct teaching of individual letters paired with sounds and using VAKT strategies (Stahl, 2003). The approach involves tracing letters, saying the name and sound, and reading short stories that contain the targeted sound. Brain research supports the use of differing modalities to instruct children (Santrock, 2008). Ludus Reading includes these key instructional components, but Ludus Reading goes further by incorporating puppets, introducing a song, using letter-sound containers, using augmented 3-D projections, and using sign language when introducing a letter and sound to the class. Research confirmed that students who received sign language instruction in kindergarten developed better vocabularies, improved visual-gestural language, and demonstrated higher reading levels (Nast, 2013). Ludus Reading introduction lessons start with the Orton-Gillingham Approach, but then Ludus Reading goes further by incorporating new instructional methods.

Further, Ludus Reading involves using I-VAKT strategies, as opposed to just VAKT strategies. The VAKT strategies incorporate visual, auditory, kinesthetic, and tactile strategies. Each area is important because it accounts for differing modalities of learning. However, the researcher for the current study added the I to represent Interactive strategies. Research supports the idea that students learn better when they are active participants (Jensen, 2005). Interactivity is described as the ability to write back

text, and the ability to publish written text instantly (Kress, 2003). For the purposes of the current study, interactivity involved students actively interacting during the lesson, which meant students had to *do* something. The students had to play or interact with technology or others. Essentially, by adding the I before VAKT, teachers are placing the importance of the students before that of the strategies or content. Ludus Reading involves the use of the new I-VAKT strategies.

The application of reading to the research study. Obviously, a key component of Ludus Reading is reading, the instruction of which targets the cognitive domain of learning. One purpose of Ludus Reading is to help develop a balance between reading instruction and play-based instruction within a standards-driven era. The content covered by the Ludus Reading Program is derived from the CCSS. Reading is a complex process. One critical component of reading instruction is phonics instruction. Kindergarten students need a strong foundation of phonics in order to become successful readers. Thus, the researcher for the current study focused on the effectiveness of the new reading program when applied to the area of phonics instruction in kindergarten. The classroom in which the research study was conducted used a balanced literacy reading approach. Ludus Reading aligns with ideas of emergent literacy and involves the application of I-VAKT strategies to teaching reading. Hence, the researcher for the current study explored the effectiveness of Ludus Reading when applied to phonics instruction in a kindergarten classroom within the Reading School District.

Play

Play is a critical component of Ludus Reading. The play section begins with a brief exploration of the history of play. The definition and type of play are described in

terms of Ludus Reading. Play aligns with the theory of Vygotsky, and a discussion of the application of play to the whole child theory will be included. Additionally, the researcher will discuss the importance and benefits of play. Ludus Reading includes the exploration of a new application of play to technology. The new concept and term is Play Technology. Therefore, the researcher will also discuss Play Technology. Finally, the researcher will discuss the applications of play in terms of the current research study.

History of play. Huizinga (1950) described play as being older than culture. Regardless, the connection between play and early childhood started in the 16th and 17th centuries in Europe, as a result of the work of Rousseau, Pestalozzi, and Froebel (Roskos & Christie, 2009). Play started in preschools in the United States in the 1920s and 1930s. The idea surfaced from Dewey's theories, regardless of the Puritans' and Protestants' work ethic mentality (Roskos & Christie). Play is important in the early childhood programs such as, Montessori, Reggio Emilia, High Scope, and the Creative Curriculum (Rosok & Christie). Play is important and essential to Ludus Reading.

Definition of play. "The fun of playing, resists all analysis, all logical interpretations" (Huizinga, 1950, p. 3). When a person plays, the whole brain is activated (Armstong, 2006). Children love to play because it is fun. Play helps children interact, express emotions, and make sense of their world (Coople & Bredekamp, 2009). Play is a complex process. Play is a concept interwoven with childhood and play is considered a human right of every child (Lillard et al., 2012). The object of Ludus Reading is not to replace or take away the importance of free play. In fact, everyday, the students participate in 30 - 40 minutes of uninterrupted free play. Rather, the purpose of the Ludus Reading program is to enhance reading instruction by providing young learners with

developmentally-appropriate instruction. Since the word "play" conjures a vast array of definitions and mental images, a definition of "play" for the research study was established. Therefore, the working definition of" play" for Ludus Reading involves the players actively interacting in a fun, enjoyable, and flexible manner. Further, if play-based learning is linked with a specific educational goal, then the children find the lesson to be engaging, fun, meaningful, and self-motivating (Sawyer & DeZutter, 2009). Therefore, Ludus Reading uses play-based instruction to make reading fun and enjoyable for kindergarten students.

Types of play. The two main types of play are free and structured. Free play involves the child selecting the play, and the adult does not place constraints on the play. Structured play involves play that is directed by the adults with a purpose of educational ends (Smith, 2009). Ludus Reading involves structured play in an attempt to find a balance between educational literacy outcomes and play. Play-based curriculum/instruction involves the purposeful planning of the environment and materials to promote play with literacy materials (Rog, 2011). The NAEYC (2012) explained that DAP involves early childhood educators incorporating play into the curriculum and instruction. Practice play involves repetitious practice with a new skill that is being learned (Santrock, 2008). Therefore, Ludus Reading involves the use of structured, play-based instruction and practice play.

Whole child. Play benefits the whole child. The idea of the whole child comes from Vygotsky. Children learn through physical, cognitive, and social and emotional learning domains. The domains are interrelated (NAEYC, 2012). Vygotsky asserted that young children learn within their Zone of Proximal Development (ZPD), which involves

tasks that are not too hard or too easy for the child. Play occurs within a child's ZPD and helps promote self-awareness, symbolic thought, and self-regulation that allow a child to control their behavior, develop positive interactions, and develop into an independent learner (Sawyer & DeZutter, 2009). Vygotsky proposed that children master skills when playing because children have repeated opportunities to practice skills by playing (NAEYC). "Vygotsky (1967, 1978) is the preeminent proponent of the position that…play increases intelligence. His claim was that repeated experiences…develop abstract reasoning" (Lillard et al., 2012, p. 8). The idea behind Ludus Reading is that if students enjoy reading experiences, then the affective domain might cross-over and, in turn, improve the cognitive domain, since the domains are interrelated. Ludus Reading involves the cognitive and affective domains of learning.

Importance of play. Play is essential for young learners (Coople & Bredekamp, 2009; Dunn & Beach, 2009; Hirsh-Pasek & Golinkoff, 2003; Huizinga, 1950; Jacobs & Crowley, 2007; Middendorf, 2008; Milteer et al., 2013; NAEYC, 2012; Zigler & Bishop-Josef, 2004). Educational theory and research have demonstrated that guided play yields superior retention of learning and academic achievement in young children (Harris et al., 2011; Latvala, 2013; Lillard et al., 2012; Milteer et al.). Further, research has demonstrated that play promotes intrinsic motivation in young children (Hirsh-Pasek & Golinkoff; Lillard et al.). Young learners feel motivated and empowered because they have choices (NAEYC). Children enjoy play and children do not have to be coerced into the experience. Children have fun with play, whereas they feel bored with too much forced instruction (Hirsh-Pasek & Golinkoff; NAEYC). The current research study included an analysis of students' responses to Ludus Reading to determine if positive

perceptions of play carry over into their perceptions about reading. Additionally, the researcher for the current study explored whether or not students demonstrated better academic performance when Ludus Reading was used. The academic performance of the students receiving Ludus Reading was compared to the academic performance of students not receiving Ludus Reading.

Benefits of play. Play is beneficial to everyone, but especially young children. When children do not play, they can suffer from depression, anxiety, and can demonstrate hostility (Hirsh-Pasek & Golinkoff, 2003). Currently in the U.S., 3.4 million people are depressed and 5% are children under the age of nine (Hirsh-Pasek & Golinkoff). Another advantage of play is that it encourages creativity (Lillard et al., 2012.; Milteer et al., 2013; NAEYC, 2012; Sawyer & DeZutter, 2009). Play helps increases children's intrinsic motivation (Walcavich & Bauer, 2007). Children move beyond rote memorization, and students get to explore and try new ideas (Smith, 2009). Children who play at school demonstrate a higher academic performance, and play-based learning experiences help enhance students' school engagement (Milteer et al.). Further, research has demonstrated that play is associated with better classroom behavior (Milteer et al.). Good behavior is directly related to an increase in academic growth.

Children learn to socialize because collaboration and conversations naturally emerge during play (Han, 2009; Lillard et al., 2012; Sawyer & DeZutter, 2009). Further, research has demonstrated that children who play develop a better vocabulary and better social competence. Play has been demonstrated to improve conceptual development, representational thinking, problem solving, and divergent thinking (Lillard et al.; NAEYC, 2012; Sawyer & DeZutter). Children who play are more imaginative, and are

able to store and recall memories and images (Sawyer & DeZutter). Therefore, the idea is that when play is applied to reading instruction, the students might develop better perceptions of reading. Additionally, students involved in Ludus Reading might demonstrate better reading performance. The current research study involved the exploration of the effectiveness of the Ludus Reading program in influencing kindergarten students' reading performance and perceptions.

Play-based literacy centers. Independent centers promote collaboration and the manipulation of materials. Additionally, children feel empowered and motivated because they have choices (Heacox, 2009; Rog, 2011; Routman, 2003). The concept of differentiated choices involves providing students with controlled choices (Heacox). Students are assigned to flexible groups based on their readiness levels. Each ability group has an assigned color. The play-based literacy centers are stored in color-coded containers that match the color of the student's assigned group. The literacy centers are not referred to as workstations in the classroom because work is the opposite of play. The researcher coined the term "play-based centers" as differentiated centers that target a set skill, and include playful, interactive materials. The main purpose of literacy centers is to provide children with differentiated learning opportunities to practice skills or concepts that have previously been taught in class (Rog). Teachers must plan and organize learning centers so the centers are accessible for students (Reutzel & Clark, 2011). As students become more independent with the phonics play centers, the teacher is able to work with a small group of students on a targeted area of instructional need. Ludus Reading includes phonics play centers.

Technology play: a new kind of play. In a technology era, a reconceptualization of play was needed to understand what it means to think, learn, and play in an information age (Sawyer & DeZutter, 2009). The NAEYC and the Fred Rogers Center for Early Learning and Children's Media [FRCELCM] (2010) explained that technology is appropriate for kindergarten students because young learners are curious about the world about them and interactive technologies provide young children with the opportunity to demonstrate creativity and learning. Also, technology play experiences provide kindergarten students with the opportunity to construct an understanding of how technology works (NAEYC & FRCELCM). Ludus Reading involves students playing and interacting with new digital literacy. Previous research studies did not link play-based literacy and technology. Ludus Reading provides kindergarten students with the opportunity to play with iPads, interactive white boards, and 3-D augmented reality. When children play with interactive technology, they are learning through the use of I-VAKT strategies.

Application of Play to the Current Research Study

Play is an essential component of Ludus Reading. Play is important to everyone, but specifically play benefits young children. Ludus Reading does not attempt to replace free play, rather, the purpose of Ludus Reading is to merge play, technology, and reading instruction in order to create a differentiated and developmentally-appropriate way for young children to learn about reading, based upon the Common Standards for English Language Arts. Ludus Reading uses play-based learning with educational goals that help enhance the learning experiences. Ludus Reading uses a structured, play-based type of play. Play-based learning centers and the new concept of Play Technology are aspects of

Ludus Reading. The premise of Ludus Reading is that play might help promote the affective and cognitive domains of learning; subsequently, students might develop better perceptions of reading and demonstrate better reading performance. Therefore, the current research study included an exploration of the effectiveness of Ludus Reading on influencing kindergarten students' reading performance and perceptions.

Technology

Another important component of Ludus Reading is technology. Therefore, the researcher will discuss technology as it applies to how kindergarten children learn. Ludus Reading involves the use of interactive technology (as opposed to passive technology). Therefore, the researcher will also give a definition of interactive technology.

Digital age. In the digital age, technology and digital media are deeply embedded in the lives of teachers, young children, and families. Teachers need to embrace the digital age because students already come to school knowing how to use many forms of technology (Puerling, 2012). Technological advancements are continually changing the instructional possibilities for teachers. The International Reading Association (IRA) explained that students cannot be considered fully literate unless they are proficient in using the new literacies of the 21st century technologies. Further, IRA (2009) identified the integration of a technology into instruction as a responsibility of every literacy teacher. Regardless of the previous mindset that technology is not appropriate for young children, NAEYC stated that technology is developmentally-appropriate for young children to use technology in the classroom (Puerling). In an effort to account for changes occurring within the digital age, Ludus Reading involves the integration of technology to enhance reading instruction.

Digital literacy. New literacy, media literacy, or digital literacy involves having children understand how to use and understand the 21st century literacies (Larson & Marsh, 2009; Morrell, 2012). The CCSS do not include standards for technology and media because the standards assume that the word literate includes digitally literate (Dalton, 2012). Educators need to find a balance between using new and traditional literacy when teaching reading. Simon and Nemeth (2012) explained that technology tools do not replace everyday materials; rather, technology provides children with new choices that go beyond one small computer area in the classroom. Teachers need to introduce print awareness skills, as well as e-print awareness skills. The researcher coined the term "E-print awareness skills," which involve students understanding how to use new literacy and technology. Students are encouraged to develop a strong understanding of the concepts of print, such as how to turn a page or follow the words on a page from left to right. E-print awareness involves students developing a basic understanding of how to use technology. Basic E-print awareness involves learning six skills: 1) students learn how to turn on the device and access the applications "apps" (Schugar, Smith, & Schugar, 2013); 2) students need to orient the screen and remove the lock screen (Schugar et al.); 3) students need to open an e-book and turn the pages, and use the interactive features (Schugar et al.); 4) students need to know how to use bookmarkers and highlighters within the e-books (Schugar et al.); 5) students need to develop technology vocabulary; and 6) students must learn how to maneuver devices using touch-screen, styluses, a mouse, and keyboard. Consequently, Ludus Reading incorporates new literacy and technology, but traditional literacy, paper books, are still used. To become fully literate, children need exposure to both traditional and new literacies.

Digital native learners. Digital Native Learners are young learners who have never experienced life without technology. The children were born after the introduction of technology, so technology is almost an innate concept. Digital Natives, also know as Generation Z, or Net Gens, include anyone born from 1998 to the present (Braiker, 2013; Sprenger, 2013). If technology is such a critical learning aspect for young learners, then why wouldn't technology be included in learning? Young learners are engaged when technology is used because the children often use devices such as smartphones or touch-screen devices at home (Blagojevic, Brumer, O'Clair, & Thomes, 2012). In the United States, more than half of all children ages 8 and younger have access to a mobile device at home, such as smartphones, iPods, iPads, or tablets (Braiker, 2013). Reportedly, 72% of iTunes' app sales are preschool and elementary learning games (Braiker). Children are able to successfully use technology at a very young age, and when technology is *not* used at school, it creates a dissonance between home and school experiences (Larson & Marsh, 2009). Regardless of the research supporting the use of technology, a large number of teachers reported that they feel uncomfortable using the technologies. Further, teachers reported that technologies are used as a reward, as opposed to enhancing literacy instruction (Schugar et al., 2013). Ludus Reading involves engaging and motivating kindergarten students to learn, so iPads are a logical choice, since many students already play with such mobile devices at home. Ludus Reading encourages the use of interactive technology at school and through homework.

Availability of technology resources. Technology is sometimes excluded from the classroom because the resources are unavailable or costly. Kindergarten is often the last grade to receive upgraded technology because technology is first installed in the

upper-level grades. Further, teachers do not always have training in how to implement or use the different technology. The teacher involved in the current study did not require district training to use various technology resources because the teacher uses technology consistently for personal and professional purposes. At the onset of the study, the teacher in the study had two computers in the classroom. However, the teacher assumed an active role in acquiring technology because the teacher recognized the importance of teaching students from their digital native perspective of learning. To prepare for the implementation of Ludus Reading, the teacher wrote and received two district grants totaling over $2,000 in order to provide students with more integrated technology, and engaging, leveled books. The grant money was used to purchase a document camera, and the 3-D augmented reality program, Letters Alive. Additionally, the funds were used to purchase over 60 different bundles of leveled books so students could actively engage in reading appropriately-leveled books.

The teacher in the current study received an interactive whiteboard during the year the Ludus Reading program was implemented because the interactive whiteboard was no longer needed in an older building. The teacher actively requested an interactive white board for eight years prior to the installation. After the installation of the interactive whiteboard, the teacher was not provided with district training on how to use the device. So the teacher sought support from a friend and learned how to use the device by playing with it, reading the e-directions, and watching YouTube videos.

Within the school district of the current study, the principal decided to provide iPads and AppleTVs to four different classrooms within the school. Unfortunately, the principal's digression did not result in the teacher receiving an AppleTV or iPad.

Regardless, the teacher used two personally-purchased i-Pads. The teacher incurred $2,000 of expenses in order to enhance the learning opportunities of the students in the classroom. The teacher recognized the importance of technology and found a way to obtain the resources needed.

Benefits of technology. Research has indicated technology does improve student performance in six ways: 1) technology improves academic performance when the technology is applied directly to curriculum objectives that are assessed; 2) technology improves academic performance when the application provides children with the opportunity to collaborate; 3) technology improves academic performance when technology is used to help monitor and track student's academic progress; 4) technology improves academic performance when the program is integrated into the instructional day; 5) technology improves academic performance when technology is used to extend the curriculum content; and 6) technology improves academic performance when teachers create technology-based classroom environments (Smith & Throne, 2007). When technology is incorporated in the classroom effectively, students' academic performance should increase because the students are engaged. Therefore, the researcher for the current study examined the effectiveness of Ludus Reading in improving students' academic performance because Ludus Reading integrates technology into the classroom.

Developmentally-appropriate technology-based classrooms. The integration of technology into the classroom is developmentally-appropriate when the teacher uses technology in an intentional and purposeful way (Simon & Nemeth, 2012). Teachers should balance technology experiences between teacher-initiated and child-initiated. Teachers need to provide students with developmentally-appropriate apps and choices in

the classroom. Students should talk and engage in conversations about what they are learning or experiencing (Simon & Nemeth). Technology promotes a challenge in the classroom because students can communicate with others online, but students still need to develop relationships with other people (Larson & Marsh, 2009). Consequently, when teachers integrate technology into the classroom, it is important to remember to incorporate it within the social context of the classroom. Ludus Reading involves the students playing together and interacting as they are using the technology. Additionally, research studies have shown how to developmentally and practically integrate technology into the classroom (Larson & Marsh; Simon & Nemeth). One purpose of Ludus Reading involves integrating technology into the classroom in a developmentally-appropriate way. Further, the researcher for the current study included an analysis of the effectiveness of the Ludus Reading program in increasing academic performance and perceptions of kindergarten students.

Interactive versus passive technology. Low-tech technology like CD players, computers, and projected videos are considered passive technology because the learners are not engaged or active during the lesson. Passive technology involves students spending time staring at a screen (Milteer et al., 2013; NAEYC, 2012; Schugar et al., 2013; Simon & Nemeth, 2012). Passive technology involves passive learning, spending sedentary activities in isolation (Milteer et al.). On the contrary, interactive technology involves the students manipulating, engaging, and interacting with the technology in an active manner (Simon & Nemeth). Passive technology is inappropriate because children need to interact and play with technology (NAEYC). Ludus Reading involves the integration of interactive technology because children have to play actively with the new

technology. The researcher defined the term "interactive technology" as technology requiring students to participate or do something. The idea of interactive technology is an antonym to passive technology. The examples of interactive technology used by Ludus Reading include an interactive whiteboard, iPads, and 3-D augmented reality alphabet projection system.

Interactive whiteboards. Fifteen years ago, teachers made transparencies for the overhead projector and now, overhead projectors are gone. Overhead projectors have been replaced with document (doc.) cameras that project whatever image is directly under it (Puerling, 2012). Additionally, interactive whiteboards provide another option for teachers to integrate technology into the classroom. The interactive whiteboards are large wall-mounted screens that work like a touchscreen (Simon & Nemeth, 2012). Further, the images created can be saved and stored. Teachers are able to scan in student work, or download images and sounds (Larson & Marsh, 2009). In 2008, a study reported that 85% of schools in the United States use interactive whiteboards (Jeans, 2011).

Research has suggested that interactive whiteboards benefit students in four ways: 1) students had an increase in enjoyment and motivation; 2) students had great opportunities to participate and collaborate; 3) students reported improved personal and social skills; and 4) students demonstrated an increase in self-confidence (Jeans, 2011). Further, research has demonstrated that when interactive whiteboards were used during a lesson, students' achievement increased by 16 percentile points (Jeans). Further, interactive whiteboards help teachers present learning through the use of the I-VAKT strategies. The interactive whiteboard is used during the introduction lesson and during student center play. The students use the interactive whiteboard to trace over the letters,

or play interactive games to find the letters and/or sounds. Ludus Reading involves the integration of having students play with literacy-based, interactive technology.

Mobile devices and multi-touch tablets. "Multi-touch devices, smartphones, iPads, and other tablet computers may very well be the most important and revolutionary development to impact education in more than a century. They have the power to completely revolutionize how children learn and how teachers offer learning experiences" (Simon & Nemeth, 2012, p. 89). Mobile devices are small computers that can be carried around. Examples of mobile devices include tablets, iPads, Androids, iPod Touch, Kindle Fire, and smartphones. The touchscreen allows the person to tap on different computer applications "apps." Mobile devices have cameras, microphones, sounds, and motion -- the screen orients and moves so the device always faces the person(Simon & Nemeth). Tablets and iPads promoted the idea that learning can occur anytime and anywhere (Hutchinson, Beschorner, & Schmidt-Crawford, 2012). iPads have revolutionized teaching possibilities and were used during the implementation of Ludus Reading.

The applications of iPads and tablets to literacy instruction have been explored minimally. Studies connecting literacy instruction and the use of iPads focus on the use for independent reading, by using i-books or e-books, and responding to books (Hutchinson et al., 2012; Schugar et al., 2013). Students can also read, discuss, and analyze books using multimedia presentations, including Wordle, to create word clouds; YouTube, to watch or share a supporting video clip; Glogster, to create a digital poster that includes images, text, music, and video clips; and Prezi, to create a cloud-based presentation that works as a zoomable canvas (Serafini & Young, 2013). Additionally,

educators of young learners use e-books because of the playful animations and playful actions that help support the understanding of the text (Blagojevic et al., 2012; Schugar et al.). Researchers have not yet explored the possibilities of using technology to teach phonics. Further, researchers have not yet linked play literacy and technology (Sawyer & DeZutter, 2009; Smith, 2009). Researchers have, however, demonstrated that children who use interactive media retain information better than their peers (Braiker, 2013). Students enjoy playing with iPads, and students can use iPads to present information using the I-VAKT strategies. Ludus Reading involves having students engaged by playing with technology to develop an acquisition of phonics skills.

Augmented 3-D reality. Ludus Reading involves the use of a 3-D augmented reality curriculum program, called Letters Alive. Logical Choice Technologies (2013) created the program Letters Alive. The program is the first curriculum program to use augmented reality. The technology brings 26 digital 3-D animals into the classroom to help kindergarten students learn to recognize their letters and letter sounds. The Letter Animals are not ordinary teaching animations or videos because Letter Animals can move and make sounds. In addition, the Letter Animals can answer questions and make comments and respond to student actions. Amazingly, students do not have to wear 3-D glasses when viewing the projection. The 3-D projection can be viewed directly (no specialized devices required). Students are engaged and amazed as they interact with the cutting-edge technology. Letters Alive is incorporated into the Ludus Reading Program. Further, the 3-D augmented reality incorporates the I-VAKT strategies. The children find the interactive experience to be magical. See Figure 5 for an example of how one student responded to the augmented 3-D reality.

Figure 5. Writing sample about using 3-D augmented reality technology.

Parental involvement/ ongoing assessment. Research has demonstrated that academic performance increases when teachers collaborate together with parents by communicating regularly (Reutzel & Clark, 2011; Strickland, 2004). Technology is an effective approach to communicate and collaborate with parents (NAEYC). Ludus Reading involves communicating to families by positing messages on the class blog -- a blog is a web log, or a website that contains postings that is accessible on the World Wide Web. The teacher posts photographs of the playful learning activities occurring in class. The teacher posts different playful activities that parents can incorporate at home to help enhance the classroom instruction. Parents need to be aware of the different enjoyable ways they can develop key reading skills at home (Strickland). Therefore, the teacher posts to the blog different skills and ways parents can play and interact with children at home.

Research has demonstrated that students perform better academically when the teacher differentiates instruction based on ongoing assessments (Watts-Taffe et al., 2012). Teachers must recognize where students are currently and where students need to be by the end of the school year. Ongoing assessments help teachers monitor and adapt instruction to meet the needs of the students (Reutzel & Clark, 2011). Ludus Reading involves the teacher continually monitoring students' academic progressions, and the teacher communicates the information to the child's parent throughout the year so the parent knows what to practice at home. Also, the teacher and volunteers works with student one-on-one and have parent helpers provide additional skill-specific support.

Ludus Reading involves keeping an assessment binder for the class. Within the assessment binder, the teacher keeps a pocket folder with each child's individual information and samples of the student's work. Additionally, the teacher maintains an electronic file portfolio folder for each student that is shared with parents throughout the year. The teacher compiles the assessment data onto an overall class spreadsheet to divide the students into the four small flexible groups.

Application of technology to the current research study. Technology is a major component of Ludus Reading, which was developed during the digital age. Therefore, technology is embedded within Ludus Reading to help digital native learners learn in a meaningful way, while helping students further develop a deeper understanding of digital literacy. Teachers struggle with implementing technology when it is not available, or when they do not receive adequate training. The teacher in the current study possessed an understanding of how to use technology and actively requested technology for the classroom. Further, the teacher wrote and received grants. In addition, the teacher

spent personal money to help upgrade the technology integration within the classroom. Technology can be integrated into the classroom in a developmentally-appropriate way, which means the teacher is intentional and purposeful when using technology. Ludus Reading involves having students play actively with interactive technology, including interactive whiteboards, iPads, and 3-D augmented reality.

Conclusions of Literature Review

The literature review included kindergarten, reading, play, and technology sections. Kindergarten has changed overtime, and kindergarten is an ideal time to teach children to learn how to read. Phonics skills are foundational in teaching children to learn how to read. Play is essential for young children. Also, technology is effective when interactive versus passive technologies are used.

Kindergarten has changed over the years, and kindergarten differs from state to state. When kindergarten teachers implement high-quality instruction, students will learn in six months what a student in an average classroom will learn in a year (Williams, 2007).

Kindergarten is an optimal time to teach children how to read. Piaget's preoperational period occurs between ages two and seven years. During the preoperational period, the children have rapid language development (Tracey & Morrow, 2006). Neuroscience suggests the first five to seven years of life are a sensitive period of brain development (Berk, 2006; Coople & Bredekamp, 2009; Espinosa, 2010). Therefore, kindergarten is an ideal time to instruct kindergarten students in reading.

Phonics skills are essential for students to learn how to read. Phonics involves the ability to recognize printed letter (graphemes) to units of sounds (phonemes) (Fox, 2005;

Stahl, 2003; Whitehurst & Lonigan, 2003). Research has demonstrated that young children's alphabet knowledge and phonics skills are significant predicators of later proficiency in reading and writing (Adams, 2003; Coople & Bredekamp, 2009; Fox; Goswami, 2003; National Reading Panel Report, 2001; Stahl).

Play helps children interact, express emotions, and make sense of their world (Coople & Bredekamp, 2009). Play benefits the whole child. The idea of the whole child comes from Vygotsky. Children learn through physical, cognitive, and social and emotional learning domains. The domains are interrelated (NAEYC, 2012). When children do not play, they can suffer from depression, anxiety, and can demonstrate hostility (Hirsh-Pasek & Golinkoff, 2003). Therefore, play is essential for young children.

The integration of technology into the classroom is developmentally-appropriate when the teacher uses technology in an intentional and purposeful way (Simon & Nemeth, 2012). Passive technology consists of spending sedentary activities in isolation (Milteer et al., 2013). On the contrary, interactive technology involves the students interacting and actively interacting when using technology. Therefore, technology is more effective when the technology is interactive, as opposed to passive.

Summary of Chapter 2

Chapter 2 included a summary of relevant literature applicable to Ludus Reading. The current research study involved kindergarten students enrolled in a half-day kindergarten program in a school district in Pennsylvania. Kindergarten is an optimal time for instructing young children to learn how to read. Ludus Reading involves connecting reading, play, and technology. Play is an important component of early brain

development because play provides the development of important neural pathways (Walcavich & Bauer, 2007). Ludus Reading involves using technology-based instruction. Ludus Reading was developed during the digital era. New literacy, media literacy, or digital literacy involves having children understand how to use and understand the 21st century literacies (Larson & Marsh; Morrell, 2009). Ludus Reading involves using interactive whiteboards and augmented 3-D reality. For the purposes of the current research study, Ludus Reading was applied to phonics instruction, which involves matching phonemes or sounds and graphemes or letters (National Reading Panel Report, 2001). Ludus Reading uses introduction lessons that expand upon the Orton-Gillingham Approach, which involves the direct teaching of individual letters paired with sounds and using VAKT strategies (Stahl). Additionally, Ludus Reading involves adding the I to VAKT (for I-VAKT) strategies to represent the importance of the student first, as well as the use of interactive technology. The researcher for the current study examined the effectiveness of Ludus Reading in terms of improving kindergarten students' perceptions and performance. Chapter 3 will include a description of the method for the research study.

Chapter 3

Method

> As a kindergarten teacher, I have many parents ask me: "What can I do to help my child to read?" or "How can I get my child ready for kindergarten?" I smile and tell parents to provide your child with enriched experiences and read to them. The parents sometimes get frustrated because they are looking for a quick fix to teach their children to read. They want to put a movie or toy in front of their child, as opposed to interacting with them. Sometimes policymakers or teachers are looking for a quick way to help every child to read. I would like to differ, and suggest that we need to use practices that are authentic and supported by research. We cannot just jump on the bandwagon whenever something new comes along in education. We must value the importance of using developmentally-appropriate practices supported by research. Ludus Reading involves providing parents with differentiated meaningful interactive activities to complete at home to support what students are learning in school. I have found that parents are very eager to support their children when they know what they need to do. Also, I have just seen students' learning take off when parents are working at home on the same targeted skills that I am teaching their children at school. Effective teaching practices must increase students' learning and motivation.
>
> —Jessica D. Redcay

Ludus Reading is a new program that was implemented, however, the archived quantitative and qualitative data were not examined to determine the effectiveness of the new program. Ergo, the purpose of the mixed-method study was to use archived

quantitative and qualitative data to explore the relationship between kindergarten students' reading perceptions and performance between the control group, students who did not receive Ludus Reading, and the experimental group, students who received Ludus Reading. Chapter 3 begins with a description of the research method and design appropriateness for the study. Next, the population, sampling, instruments, data collection procedures, and rationale are provided. At the end of the chapter, a description of the established safeguards and data analysis procedures are included.

Research Method and Design Appropriateness

A mixed-method design was appropriate for the current study because quantitative and qualitative data provided more information about the overall effectiveness of a new instructional program (Creswell, 2008). A quantitative method would have only yielded information about students' reading performance, and a qualitative method would have only yielded information about students' perceptions. Therefore, a mixed-method design was the optimal choice for the current research study because the approach aligned with the purpose of the study, and the archived quantitative and qualitative data were available and necessary. Further, a mixed-method design was appropriate because the current study provided more information than a quantitative or qualitative approach would have in isolation (Rovai et al., 2013).

When mixing approaches, it is important that the two approaches align with one another. An embedded qualitative case study was compatible with a quantitative quasi-experimental pre-post study because mixed-method studies often join and use the two types of designs (Musseus, 2011). Therefore, the research design was appropriate. The

explanatory study was the optimal research design for the research study because it aligned with the mixed-method approach and the purpose of the study.

Quantitative component of current research study. The dominant quantitative component of the current research study used a quasi-experimental pre-post, longitudinal, retrospective design. The archived quantitative -- KDRA2, KDIBELS, Grade1DRA2, and Grade1DIBELS -- data were analyzed to determine differences in kindergarten students' perceptions between the control group and experimental group. A quantitative study was appropriate because the study involved examining the relationship between the variables (Rovai et al., 2013).

***Quasi-experimental pre-post design*.** A quasi-experimental pre-post design involved analyzing two groups that could not be randomly assigned before and after the introduction of the independent variable (Cook & Campbell, 1979; Creswell, 2008; Sproull, 1995; Trochim, 2006). In a classroom setting, students could not be randomly assigned to different groups, however, the researcher for the current study sought to examine the difference between students' participation in Ludus Reading and students' reading performance on KDRA2 and KDIBELS. The assessments were provided to both groups before and after instruction. A quasi-experimental pre-post research design was appropriate to use in educational settings to examine the effectiveness of new instructional programs (Creswell, 2014). Further, a quasi-experimental pre-post study was an optimal research design because the design is the strongest type to use to determine the effectiveness of a new reading program because the results before and after the instruction were compared between an experimental and a control group (Rovai et al., 2013).

Retrospective design. A retrospective design involved analyzing archived quantitative data to explain the relationship among variables (Cook & Campbell, 1979; Creswell, 2008; Sproull, 1995; Trochim, 2006). The retrospective design was appropriate because the new reading program was implemented. Yet, the data were never analyzed to determine the effectiveness of the new program. "The ultimate purpose of literacy research is to deepen understanding of and thus improve literacy education" (Duke & Martin, 2011, p. 11). Therefore, a retrospective design was the best design because the purpose of the current research study was to examine the archived data to determine the effectiveness of Ludus Reading.

Longitudinal design. A longitudinal design was used because the students' retention of skills was tracked from kindergarten to the beginning of first grade. Research was needed to not only examine students' reading performance, but also to observe the long-term retention of skills in the proceeding school years (Duke & Martin, 2011; Neuman, 2005). A longitudinal design was optimal for the current research study because two different groups of students are considered more comparable when the data is gathered at different points over time (Hansen et al.). Further, the researcher for the current study sought to explore if students' retention of skills improved with the use of the new reading program.

Embedded qualitative component of research study. The qualitative design involved an embedded historical, explanatory case study design. A qualitative method was appropriate because the current research was used to gain a deeper understanding of behaviors. Qualitative studies involve exploring how people make sense of their experiences (Rovai et al., 2013). The current research study involved exploring how

students felt about their experiences with the new reading program. A qualitative study was the optimal research design for the current study because the purpose of the study was to explore archived qualitative data (learning profiles) to develop an understanding of kindergarten students' perceptions of reading between the control and experimental groups.

Academic performance is important, but the process of learning is also important. Students must enjoy reading so they want to read. The embedded qualitative study involved exploring students' feelings about the new reading program. "Students will not walk out of classroom with internal motivation to read if they see reading as an act that takes place only in school under the control of their teachers. Reading ultimately belongs to readers, not schools, and not schoolteachers" (Miller, 2009, p. 171). Academic performance is important, but schools also must increase school engagement. "In schools, the need to support social and emotional learning and healthy child development must be held alongside the need to increase academic scores. Otherwise, school engagement might suffer and efforts at creating a better prepared generation might fail" (Milteer et al., 2013, p. 209). Therefore, the dominant quantitative aspect of the current research study focused on students' performance, and the embedded qualitative aspect of the research study focused on students' perceptions. An embedded qualitative study was important because it involved exploring the kindergarten student's perceptions of reading between the control and experimental groups.

Historical case study design. The qualitative research study involved writing about a group of people and describing how the group acts, thinks, and talks (Creswell, 2008). A historical case study involved using historical data to describe an event that was

bonded within a set timeframe and context (Baxter & Jack, 2008). The researcher for the current study focused on students' learning profile data to develop a deeper understanding of kindergarten students' perception of reading. The historical data spanned from 2011 - 2013 within the four half-day kindergarten. The researcher for the current study focused on the learning profile data for the experimental and control groups because learning profiles were already archived and available, but the data were not analyzed to determine whether or not the students' perceptions of reading were influenced based on the various implementation of Ludus Reading. A case study was appropriate to use when determining students' perceptions of a new program (Creswell, 2008).

Population

The population for the current research study included all kindergarten students in the United States. The research study used a convenience sample of kindergarten students, and it is assumed that the sample can be generalized to all other kindergarten students within the United States, with certain limitations. The researcher for the current study did not use anything specific to Pennsylvania, rather, the research study involved using nationally-normed DIBLES tests. Further, the new program was based on the CCSS, which have been adopted by most states. It was assumed that the results of the current research study could be generalized to all kindergarten students in the United States, with certain limitations.

Sample Size

A power analysis was conducted to determine minimum sample size necessary to find a difference between groups if one existed in the population (Sproull, 1995). Prior to

conducting a power analysis, initial statistical parameters were set to ensure a valid sample size was obtained. For H1, a formal power analysis was conducted using the following parameters: (a) power = .80, (b) expected effect size = .40, and (c) alpha = .05. Thus, using G*Power 3.0.10 (a sample size power analysis program), 73 participants were needed to produce an 80% probability of finding a relationship if one existed (Faul, Erdfelder, Buchner, & Lang, 2009). Thus, using Analysis of Covariance (ANCOVA) to test hypotheses 1, 3, and 4, 73 participants were needed to produce an 80% chance of finding a relationship if one existed. See Appendix A, Figure A1, which displays a screenshot of the G*Power 3.0.10 test.

A second power analysis was conducted to determine minimum sample size necessary for Hypothesis 2. A second power analysis was necessary since Hypothesis 2 was tested using a MANCOVA statistical strategy. Using the same aforementioned statistical parameters, 68 participants would be needed to find a difference if one existed in the population. Since the first power analysis required a larger minimum sample size (73), the minimum sample size for the study was 73 participants.

Nonetheless, if a sample size of at least 73 participants was used, then the test would demonstrate statistically significant results with an alpha score of .05. In social science research, alpha of .05 is a common standard score to use because it strengthens the statistical significance of the test (Sproull, 1995). An alpha =.05 scores means that risk of being wrong is 5 times out of 100. Social researchers use alpha .05 scores or smaller because human behavior is less predictable than controlled phenomena (Sproull).

During the 2011 - 2013 school years, 246 kindergarten students attended the elementary school within the school district. During the time of the study, three

kindergarten teachers taught kindergarten, so each teacher was assigned one third of the kindergarten students. Out of the 246 students, approximately one third of the students, 82 students, were in the kindergarten class during the time of the study. Consequently, the test should have yielded a statistically significant sample size for the current research study.

Every student enrolled in the targeted kindergarten class during the time of the current study was included in the research study. The only students who were excluded from the study were students who moved in or moved out of the school during the time of the study because their data were unattainable or incomplete. Additionally, the moderating variables of gender and speech language services were included in the study. Other moderating variables were excluded from the study because the information was unavailable. Data on the students' socio-economic status were not accessible because socio-economic status was determined by students' eligibility to receive free and reduced lunch. Nevertheless, in half-day kindergarten, students do not receive lunch, so the information about students' socio-economic status had not yet been recorded. Also, students with special needs were not analyzed separately within the study because Graue (2006) explained that some students are not always identified with special needs or disabilities in kindergarten. As students progress through school, they will be identified. Therefore, the additional moderating variables of socioeconomic status and special needs services were not included because the information was unavailable.

Nonprobability Sampling

Non-probability sampling was used for the current research study because the research participants were selected based on convenience (Rovai et al., 2013). A

convenience sample includes using available participants, however, convenience samples are common for social study research (Creswell, 2014). A convenience sample was used in the current study, as opposed to a sample population, because the students could not be assigned randomly to different groups within an educational setting. For the current research study, a convenience sample was also used because the research study used archived data provided by the school district.

Ethical Safeguards of the Study

Within the Reading School District, teachers are required to cover specified content, but teachers have freedom in how content is delivered to the students. Therefore, the teacher involved in the current study ensured the same content was delivered to the experimental and control groups, however, the instructional methods used were different. Every year, the district collects DRA2, DIBELS, and learning profile information about the students. The new instructional method was implemented, however, its effectiveness was not explored. The assessment data collection and instructional practices were common and ongoing school and classroom procedures. The researcher for the current study did not need to obtain signed informed consent forms from the participants' parents or guardians because the researcher used only archived data.

With signed permission from the assistant superintendent of the school district and with approval from the Institutional Review Board (IRB) to ensure compliance with the protection of human participants in research (Rovai et al., 2013), the researcher obtained archived data from the district's reading specialist for students attending kindergarten and first grade during the 2011 - 2013 school years. The information remained confidential. A pseudonym of Reading School District was used throughout the

study. Additionally, each participant was assigned a corresponding randomly-assigned number. Data with confidential information were secured in a locked, fireproof box for the duration of the study, and the data will remain in the locked box for an additional five years after the study is completed. At the end of the five years, the documents will be shredded and discarded.

Background information on school district involved in the current research study. The participants involved in the current research study were kindergarten and first grade students who attended the Reading School District from 2011 - 2013. The Reading School District is located in southeastern Pennsylvania. The district is a public school system rooted within a suburban and rural community. The districts' student population consisted of 19% minority and 25% of students were classified as low income. Mixtures of families existed within the school district, including blue collar, professional, and agricultural workers. Approximately 7,000 students attended the school district consisting of seven elementary schools, two middles schools, and one high school. The district scored significantly above the mean on state and national assessments. Generally, 97% of the students graduated and 64% of the students continued on to pursue education beyond high school.

Background information on teacher involved in the current research study. The kindergarten teacher who participated in the current study taught half-day kindergarten. Each year the teacher had approximately 40 - 50 students (split between morning and afternoon kindergarten sessions). The kindergarten teacher was a certified early childhood teacher, which means the teacher was certificated to teach children spanning from birth to third grade. In addition, the teacher was a certified elementary

school teacher, which means the teacher was certified to teach children spanning from kindergarten to sixth grade. Further, the teacher was a certified reading specialist, which means the teacher could teach reading to students spanning from kindergarten to 12th grade. The teacher started teaching kindergarten in 2006 and was still teaching kindergarten when the current study was conducted. The teacher had a master's degree, plus additional credits.

In the fall of the 2011 - 2012 school year, the kindergarten teacher who participated in the current research study had a student teacher. The student teacher graduated in the winter and started working as a substitute teacher within the school district. Then, during the 2012 - 2013 school year, the kindergarten teacher was absent for 12 weeks under the FMLA. The teacher's previous student teacher stepped in for the teacher as a substitute. The substitute teacher was familiar with the teacher's classroom policies and procedures. Further, the teacher left detailed typed lesson plans that were followed by the substitute teacher.

The teacher who participated in the current research study read many professional development books and attended professional development workshops. The teacher tried to model and share a passion for reading with every student. The teacher spent a lot of time planning instruction, and every aspect of the classroom was intentional and purposeful. However, when the students arrived, the teacher then focused on bonding and caring about each student in the classroom. Effective teachers: (a) care about and support students; (b) strive to be lifelong learners; (c) connect to the students by seeking to help students reach their fullest potential; and (d) reflect on their teaching practice (Espinosa, 2010; Routman, 2003). The kindergarten teacher who participated in the current study set

a personal goal to adopt each of these characteristics of an effective teacher. The teacher referred to Routman's (2003) statement when teaching: "Enjoy your students, enjoy your teaching, and enjoy your life" (p. 221). The teacher tried to make learning fun and enjoyable for every student.

Core instruction. In order to establish consistency in the current research study, the teacher who participated in the study created over 1,000 core reading and writing lesson plans to ensure the same content was implemented both school years. Both groups received the same core instruction, which included Reading Workshop, Kid Writing, and Guided Reading Instruction implemented during Response to Intervention (RtI) time. Additionally, every day when the students arrived to school, the students had 30 - 40 minutes of uninterrupted free play.

Kid writing. Kid Writing was a part of the core instruction, and both groups, control and experimental, who participated in the current research study participated in Kid Writing. Kid Writing was integrated into the guided reading time. Additionally, Kid Writing was implemented for 30 minutes one out of every six-cycle days. Each student had a writing journal that was used for the student to draw and write one story in each day. Kid Writing involved students drawing pictures and writing stories in journals. Students were encouraged to copy words from the classroom, stretch out the sounds in words, and to use invented spelling when unsure. After the students finished writing, the teacher would write under the students' writing (Feldgus & Cardonick, 1999). Kid Writing is based on the Emergent Literacy philosophy. Young learners learn about phonic skills through many meaningful, authentic experiences. Parents are invited into the classroom to help the students with their Kid Writing stories.

Reading workshop. Both years, reading workshop was used. Reading workshop was incorporated for 15 - 30 minutes every cycle day. During reading workshop time, the teacher introduced a mini lesson. The teacher used a read aloud to model strategies for selecting appropriate books and comprehending the text. After the mini lesson, the students had the opportunity to self-select books and read independently (Tompkins, 2005). Research has demonstrated that students have a stronger interest in reading when classrooms have accessible libraries and comfortable, quiet places to read (Reutzel & Clark, 2011). The teacher who participated in the current research study provided bins of books in the classroom for students to select based on character, topic, interest, level, or author. Research has demonstrated a positive correlation between students having access to multiple books and positive reading performance (Routman, 2003). The teacher who participated in the current study incorporated Reading Workshop every day. Additionally, the teacher created a little "reading garden." The students could sit on a shaggy, green rug that had a white picket fence around the bookcases. The bookcases had tubs of books and the students were invited to "grow" into readers.

Guided reading. Both years, guided reading was incorporated. Within the Reading School District, guided reading was incorporated during the RtI timeframe. RtI time was implemented for 30 minutes five days out of six cycle days. "Response to Intervention is simply put, a process of implementing high-quality, scientifically validated, instructional practices based on learners needs, monitoring student progress, and adjusting instruction based on the student's response" (Bender & Shores, 2007, p. 7). RtI typically has three tiers of reading intervention. Tier One involves the core curriculum (Al Otaiba et al., 2011; Weaver, 2009). Guided Reading is a part of the

common core curriculum. During guided reading time, the teacher who participated in the current study scaffolded the instruction to help students develop reading skills (Tompkins, 2005). The students were grouped together based on the results of the Developmental Reading Assessment, Second Edition (DRA2) score, and the determination of the teacher (Boushey & Moser, 2009; Fountas & Pinnell, 1996; Richardson, 2009). Within the Reading School District, the teacher divided the class into four groups based on ability. The teacher met with two groups each day. The other two groups rotated between the reading specialist and the teacher's aide. When the students were not meeting with the teacher, the students were writing in their Kid Writing journals, participating in a literacy game or activity, or reading from various book bins. Guided reading was incorporated five out the six cycle days.

Harcourt reading program. The teacher who participated in the current study incorporated content from the Harcourt Trophies Reading Program during both school years. The control group had instruction from the basal reading program; however, the group receiving the treatment received the same content of the program, but through a different, developmentally-appropriate, differentiated program: Ludus Reading. The Harcourt Reading Program was implemented for 30 minutes to one hour every day. The teacher who participated in the current study used the Harcourt Trophies Reading Program for Ludus Reading's order for the introduction of letters, sounds, and sigh words. Both years, the program provided pre-decodable and decodable readers for the students (Beck, 2003). Harcourt Trophies Reading Program is a basal reading program. "Basal reading programs remain the dominant means of reading instruction in the United States" (Tyner, 2009, p. 2). Basal readers are commercial textbook programs. Basal

readers have been used in American schools since the 1830s. The first basal program was the Mcguffey Readers, and later programs like Dick and Jane emerged (Cooper et al., 2010). The program is scripted and it includes a plan for every day of the school year. The program included books to read aloud and worksheets for the students to complete. Ludus Reading involved using the basal reading series as a springboard or guide for what needs to be taught. However, research has demonstrated that literacy performance increases when the teacher "uses the core literacy curriculum more flexibly and creatively than the publisher recommended" (Watts-Taffe et al., 2012, p. 313).

Ludus Reading

During the 2012 - 2013 school year, the same teacher continued providing students with core reading instruction; however, the teacher implemented the Ludus Reading program for 30 minutes to one hour every day instead of the basal reading series. Ludus Reading combines interactive technology, play, and reading instruction. Students learned about phonics using the I-VAKT strategies. Ludus Reading involves using (a) a playful introduction lesson and letter/sound manipulation and play-whole class; (b) phonics play centers-individual and differentiated lesson-small, flexible groups.

A playful introduction lesson and manipulation/play. Ludus Reading starts with a playful introduction, followed by time for the students to play and manipulate letters, sounds, and words. The introduction lesson and manipulation/play time occurred in a whole class setting. The teacher who participated in the current study used 180 Ludus Reading introduction lesson plans and activities. The kindergarten teacher introduced every letter and letter sound to the students by singing a letter-sound song matching a poster that the students pointed to during the song. The teacher introduced the American

Sign Language hand sign for each letter in the alphabet. Next, the teacher lead the students in the formation of the letter as the students wrote in the air. The teacher read a book featuring the letter and letter sound. The teacher used the Alpha Tales book set. Research has demonstrated that alphabet books are a great way to teach letter names and sounds (McGill-Franzen, 2006). The teacher projected the 3-D augmented reality image of the letter, and an image of the animal associated with the sound. The teacher showed the students toy objects that started with that letter sound.

Next, as a whole class, the students have time to individually manipulate and play with letters, sounds, and words. Every student in the class used an alphabet mat with Velcro letters. The students had to take the letters and move them on the mat to build different words. At the beginning of the year, the students had to locate different letters by name. Later, the students had to find different letters that matched the sound. Later in the year, students had to build words with the Consonant-Vowel-Consonant (CVC) pattern. Students had to recognize the beginning, middle, and ending sounds in words. Students built the words and held up the mat to show the teacher. The students received the opportunity to play with the letters and sounds. Further, the students practiced building nonsense words, which aligned with the nonsense words section of the DIBELS assessment. Further, the students practiced using sign language to finger spell words.

Phonics play centers and differentiated small group lessons. After the introduction lesson and activity, the students had time to use the phonics play centers independently. The students played with centers that were differentiated by students' different modalities preferences and readiness level. Research has demonstrated that literacy increases when children use literacy play materials (Lillard et al., 2012). The play

materials for the centers were stored in plastic, color-coded containers and the teacher demonstrated how to use and take care of the center prior to the student's free center experiences. Further, students enjoyed having choices about what center to use. Some of the center choices involved using an interactive white board or iPads to play games.

The Ludus Reading phonics play centers are differentiated based on students' academic needs. Differentiated Literacy Centers (DLC) are centers based on multilevel activities. The DLC take into account the students' interests and ability level (Southall, 2007). Ludus Reading involves progress monitoring the kindergarten students' skills and then placing the students into flexible differentiated groups. Each group is color-coded and the students use centers that correspond with their group's color. The centers are stored on a shelf that matches that group's color so the students are able to easily access the centers.

Students were assigned to one of the four ability color-coded groups: blue (highest), green (high-average), yellow (low-average), and red (low) group. The groups are flexible, and students are placed in groups based on the ongoing assessment data. The teacher stored the assessment data in a binder with a pocket folder for each student and each student had an electronic assessment folder. The assessment data for each student was compiled into a spreadsheet. Then, based on the students' ongoing assessment results, the students were placed into ability groups.

Students in the red group were not yet able to recognize the letter names of uppercase and lowercase letters. Students in the yellow group were able to recognize their letters, but not fluently. The students could recognize some beginning letter sounds, but the students needed additional practice. Students in the green group were able to

recognize all of their letters fluently, but the students needed additional practice with the beginning letter sounds. Students in the blue group were able to recognize all of their letter names and beginning letter sounds fluently. Students needed practice applying their skills to their reading and writing. Also, students needed additional practice reading and writing sight words.

As students played with differentiated learning centers, the teacher met with different small groups. The teacher used a binder of 320 lessons plans to instruct students during small group instruction. Each lesson was numbered and the progression increased, based on literacy skills' difficulty level. The activities and materials for each lesson were stored in a hanging folder labeled with the lesson number. The classroom teacher used a different lesson number based on the needs of each ability group.

Data Collection Procedures and Rationale

After receiving signed permission from the assistant superintendent of the school district and after receiving approval from the IRB, the researcher for the current study obtained the achieved learning profile, DRA2, and DIBLES data from the school district's reading specialist for students attending kindergarten and first grade during the 2011 - 2013 school years. Ludus Reading was implemented in the school district. Yet, the archived data were not analyzed to determine the effectiveness of Ludus Reading. Archived quantitative and qualitative data were available and necessary. The district had additional data on file. However, the data were irrelevant because the data did not relate to the students' reading performance or perceptions, specifically in the area of phonics instruction. Further, the researcher for the current study used pre-existing, archived data, as opposed to imposing data techniques, such as interviews or surveys. The researcher

did not want to interfere with what already naturally occurred within the classroom setting. Therefore, using archived DIBELS, DRA2, and learning profile data was the optimal data collection technique for the current research study because the data collection technique naturally occurred within the classroom setting, and the technique aligned with the research study's purpose and design.

Instruments

The instruments used by the school district included DRA2, DIBELS, and learning profiles. These instruments were selected for the current study, as opposed to other instruments, because the school district used these assessments every year, and the researcher for the current study used archived data. The researcher used DRA2 and DIBELS to assess the students' reading performance. The learning profiles were used to explore the students' reading perceptions.

Learning profiles. Learning profiles are stored information about students' learning preferences (Tice). In the Reading School District, every student had a personal learning profile, which included teachers' anecdotal notes and interest surveys. The researcher for the current study examined the archived students' responses to two questions: 1) How do you feel about reading? and 2) What was your favorite part of reading? If the students would have written the responses to the questions, then the responses might not have accurately represented how the students' felt because many of the students were still emerging writers and they wrote a limited amount. Therefore, students' responses were dictated by the student and recorded by the teacher. Learning profiles were gathered for every student in the school to collect information about students' learning preferences and interests. The pre-service teacher talked one-on-one

with students and recorded the students' responses. The archived learning profile information about reading was collected at the end of the year, and the perception data were used to compare the control and experimental groups.

Dynamic Indicators of Basic Early Literacy Skills development. The Dynamic Indicators of Basic Early Literacy Skills (DIBELS) test was developed by Deno and colleagues at the University of Minnesota in the 1970s, and then the research on the DIBELS was conducted at the University of Oregon in the 1980s. University of Oregon's Center on Teaching and Learning (CTL) continues to research and document information about DIBELS (University of Oregon, 2012). The DIBELS test measures General Outcome Measures (GOMs) to determine if students are reaching long-term literacy goals, as opposed to teachers assessing the student's mastery of the curriculum (University of Oregon). Benchmark goals are a guide for teachers to determine the performance of the student in terms of becoming a successful reader. The benchmark score ranges are used as a longitudinal probability predicator. The score does not state that the child will not become a reader. Still, the score provides a recommendation for students who might or might not need further reading interventions (University of Oregon). Research supports the predictability of the subset of reading skills to later reading and comprehension performance. Most studies have indicated a correlation of .85 to .87 (Howard, 2005).

DIBELS is a standardized assessment tool to monitor students, kindergarten through third grade, on their progression in becoming a reader. The test measures early development and early reading skills that align with five main pillars of reading and the CCSS (University of Oregon). The tests are timed and last about one minute each. The

timing is unobtrusive because the administrator uses a silent count-down timer and students are normally unaware that they are being timed. Kaminski and Cummings (2007) explained two purposes for DIBELS to use timed tests: (a) to measure fluency in early literacy skills, fluency information moves beyond accuracy measures and demonstrates students' mastery of performing a task automatically; and (b) fluency results are more sensitive in demonstrating small changes in growth and development over time. The DIBELS manual provides detailed instructions for administering the test. Teachers and reading specialists must receive training so the test is administered and scored in a uniform way.

Currently, 2 million students across America are assessed using the DIBELS (University of Oregon). The DIBELS data can be aggregated and used to check the effectiveness of a new intervention program of a district, school, or class. The data can be used to analyze the effectiveness of a program across a school year or multiple school years (Kaminski & Cummings). "DIBELS may be used with any curriculum or program using any particular approach or strategy provided that students are taught the component skills with sufficient depth, breadth, and integration to become successful readers (Kaminski & Cummings, 2007, p. 10). The researcher for the current study sought to analyze the archived DIBELS data to determine the effectiveness of Ludus Reading, specifically in the area of phonics instruction.

Reading School District used two different versions of the DIBELS over the course of the study. During the 2010/2011 school year, the school district used the DIBELS-Sixth Edition. During the 2011/2012 school year, the school district used the DIBELS Next. The two versions are similar in terms of how the assessment was used and

scored in kindergarten. However, the recommended General Outcome Measures (GOM) differed between the two versions. Therefore, for consistency purposes, the researcher for the current study used DIBELS GOM from the end-of-the-year DIBELS-Sixth Edition for both school years. Also, the researcher for the current study did not include the scoring of students reading the whole nonsense words because the criteria differs between the two versions. Other than previously noted differences, the DIBELS-Sixth Edition and DIBELS Next are the same when used to assess kindergarten students.

Administering. The Reading School District began administering the DIBELS during the 2009/2010 school year, and the school district continues to use DIBELS tests with students (kindergarten through third grade). The DIBELS were administered three times a year (beginning, middle, and end). The school district had a DIBELS team to assess students one-on-one. The team consisted of reading specialists and reading tutors trained in administering and scoring the DIBELS. Each test administrator received the same DIBELS training from the Intermediate Unit (IU) workshop series. Training materials for each participant costs approximately $40 (Howard, 2005). The classroom teacher was not included as a part of the DIBELS team.

The DIBELS used a standardized administration and scoring procedures. The administrator of the test had to read directions from a scripted, uniform teacher manual. To ensure the validity of the test, the administrator did not deviate from the script once the test started (University of Oregon, 2012). Therefore, it was assumed that everyone on the team administering the DIBELS was trained and each member followed the guiding directions for administrating and evaluating the test.

Scoring. The reading specialist collected each student's test booklet, and the reading specialist entered the raw data into the DIBELS Data System (DDS). The DDS, which was developed by the University of Oregon, is a web-based data system used for data entry. Additionally, the DDS organizes and presents data into charts and graphs. Currently, 15,000 schools in the United States use the DIBELS DDS (University of Oregon, 2012). "Schools pay $1 for processing by DIBELS Data System… for each test for each pupil" (Goodman, 2006, p. 5). Reading School District purchased the online data tracking system, so the data for each student and subtest were converted into data and tables, and further data were stored and archived. The reading specialist provided the archived DIBELS data for the current research study.

The raw scores fell within a corresponding score range that reflected a recommendation category: intensive, strategic, or benchmark. Students were considered at risk if they scored within the lowest 20th percentile of the norm across the country; these students were categorized as intensive. Students were considered at some risk if they performed between the 20th percentile and 40th percentile of the norm across the country; these students were categorized as strategic. Students were considered at low risk if they performed above the 40th percentile of the norm across the country; these students were categorized as benchmark or core (Good, Simmons, Kame'enui, Kaminski, & Wallin, 2002; Howard, 2005; University of Oregon, 2012).

Subtests. The DIBELS has four subtests. Initial Sound Fluency (ISF) and Phoneme Segmentation Fluency (PSF) measure students' understanding of phonological awareness. Nonsense Word Fluency (NWF) - Correct Letter Sound (CLS), and Letter Naming Fluency (LNF) measure students' understanding of the alphabetic principle

(University of Oregon, 2012). The researcher for the current study examined students' pre- and post-DIBELS NWF and LNF because the researcher focused on students' understanding of phonics and the alphabetic principle.

DIBELS LNF. The DIBELS (LNF measures a student's ability to recognize letters (University of Oregon, 2012). Students had a paper with upper- and lower case letters arranged randomly. The students were asked to name as many letters as they could in one minute (University of Oregon). "LNF actually tests the ability to name upper- and lowercase letters presented in a single font rapidly and accurately" (Goodman, 2006, p. 12). The examiner calculated and recorded the number of letters the student identified correctly. Thus, the raw score was comprised of the number of letters that the student identified correctly within one minute (University of Oregon).

Reading School District measured DIBELS LNF in kindergarten three times a year: beginning (fall), middle (winter), and end (spring). The researcher for the current study used kindergarten DIBELS LNF scores from the beginning and end of the school year. Grade1DIBELS LNF scores were assessed at the beginning of first grade. For consistency purposes, the researcher used the end-of-kindergarten DIBELS-Sixth Edition benchmark recommendations. The DIBELS LNF scores ranged between 0 - 40+. Students scoring 0 - 28 were considered below the norm; students scoring 29 - 39 were considered equivalent to the norm; and students scoring 40+ were considered above the norm.

DIBELS NWF-CLS. The DIBELS NWF measures the alphabetic principle, which includes letter-sound correspondence, as student blend letters into make-believe words (University of Oregon, 2012). "NWF actually tests the ability of children to match

letters to sounds either one at a time or by "saying" a whole nonsense syllable accurately and rapidly" (Goodman, 2006, p. 13). Nonsense words were used instead of real words because students differ on their sight word recognition skills, and nonsense words reflect a student's ability to decode an unknown word (Howard, 2005). The students were presented with a paper with Vowel-Consonant (VC) and CVC nonsense words.

The students were allotted one minute to read as many letter sounds as possible (University of Oregon, 2012). The raw score consisted of the total number of sounds correctly produced within one minute. The examiner calculated and recorded the raw score of total Correct Letter Sounds (CLS). A point was given for each sound correctly produced by the students. A student could earn a total of three sounds when reading a CVC word (example: voj) (University of Oregon). Differences exist between the DIBELS-Sixth Edition and DIBELS Next concerning how the entire nonsense word was scored when the student read the entire nonsense word. Therefore, the researcher for the current study focused only on the NWF CLS scores.

Reading School District measured DIBELS NWF-CLS in kindergarten two times a year: middle (winter) and end (spring). The researcher for the current study used kindergarten DIBELS NWF-CLS scores from the middle and end of the year. Grade1DIBELS NWF-CLS scores were assessed at the beginning of first grade. For consistency purposes, the researcher for the current study used the end-of-kindergarten DIBELS-Sixth Edition benchmark recommendations. The DIBELS NWF-CLS scores ranged between 0 - 25. Students scoring 0 - 14 were considered below the norm; students scoring 15 - 24 were considered equivalent to the norm; and students scoring 25+ were considered above the norm.

Application of DIBELS to the research study. The DIBELS was a valid and reliable assessment tool for measuring subset skills of reading. Further, DIBLES helps predict later reading performance outcomes by comparing the students' scores to the national norms. The DIBELS LNF data yielded information about kindergarten students' automatic letter naming skill set. The DIBELS NWF-CLS data provided information about kindergarten students' abilities to decode letter sounds. The DIBELS provided information about students' phonics skills. The DIBELS was used in combination with another form of assessments to provide a more comprehensive understanding of students' overall reading performance (Kaminski & Cummings, 2007). The researcher for the current study used the DIBELS scores; however, the researcher also used the DRA2 scores to gather a more comprehensive understanding of the effectiveness of the new reading program.

Developmental Reading Assessment, second edition. Developmental Reading Assessment, Second Edition (DRA2) is a running record assessment. The teacher administered the DRA2 one-on-one (Beaver & Carter). "DRA2, K-3, enables primary teachers to systematically observe, record, and evaluate changes in students reading performance" (Beaver & Carter, 2005, p. 4). The assessment is used for grades kindergarten through eighth grade. The purpose of the assessment was to gain information about students' reading level and inform instruction (Pearson Education, Inc. [PEI], 2011). The Reading School District provided the assessment materials; however, the district did not provide the online management system. Therefore, the teacher who participated in the current study created and recorded the data collected in a self-created

spreadsheet. The researcher used DRA2 to assess the students' ability to apply their decoding skills to their overall oral fluency reading level.

Running records. Running records signal the text level that is appropriate for instruction. One commercial running record kit is the Developmental Reading Assessment, Second Edition (DRA2) (Richardson, 2009). A running record provides the accuracy level by dividing the number of words read correctly by the total numbers of words in the passage. The total provides an accuracy percentage yielding the students' reading level (Cooper et al., 2010; Richardson). The researcher for the current study focused on students' accuracy percentage because the percentage was used to determine students' independent reading level.

A running record included information about miscues or mistakes that occur when the student is reading orally. The teacher who participated in the current study analyzed the type of miscue, including meaning, structure, or visual cues (Richardson, 2009). The running record provided information about the strategies the reader used when attempting to read an unknown word. The teacher assessed for self-corrections, which involved the reader correcting initial miscues. The teacher assessed comprehension by having the students retell the story, answer questions, and make connections (Richardson). The comprehension score was reported on a corresponding rubric and calculated into a percentage score. The comprehension scores were not reported for the current research study. Moreover, the comprehension scores were used to help determine the students' independent reading level. Research studies have demonstrated that rapid decoding skills improve comprehension because when readers struggle to read words, they lose the meaning (PEI). If a student could not comprehend what he or she read, then the student

was moved back one oral reading fluency level. Therefore, the comprehension score was considered in the current research study, but the oral reading fluency scores more accurately reflected the students' overall abilities to apply decoding skills within the context of actually reading.

Leveled texts. The readability level, or text difficulty level, is determined by the sentence complexity and vocabulary difficulty (Vacca & Vacca, 2008). Reading Recovery, an early intervention program that began in New Zealand in the 1970s, matched leveled reading materials with readers. Reading Recovery was implemented in the U.S. in the 1980s (Szymusiak, Sibberson, & Koch, 2008). Publishing companies began publishing leveled readers, little books categorized under a leveling book category. The level was represented by a letter or number depending on the leveling system. Fountas and Pinnell used an alphabetical leveling system from A to Z (Szymusiak et al., 2008). The Reading School District used the DRA2 levels; the levels progressed in a sequential order: A, 1, 2, 3.... Leveled books provided students with books that were neither too easy nor too hard (Fountas & Pinnell, 1996; Szymusiak et al.). Level books were provided to students based on individual independent reading DRA2 levels; previously, the DRA, first edition, used students' instructional reading level (PEI). The researcher for the current study analyzed the students' independent reading level pre- and pos- scores. The assessments were administered and compared two times a year (PEI). The current research study involved analyzing archived January and June kindergarten scores, and September Grade1DRA2 scores.

History of DRA2. The DRA first edition was developed, tested, and revised by Joetta Beaver in Ohio between 1988 and 1996. DRA2 (Second Edition) emerged in Ohio

in 2005 (Beaver & Carter, 2005). The Second Edition included: (a) revised assessment texts; (b) new fiction and nonfiction assessment texts; and (c) an assessment process that is more uniform across DRA K-8 levels, but still developmentally-appropriate for primary students. The DRA2 kit included benchmark assessment books that ranged from Level A to 40 (Beaver & Carter).

Benchmark Assessment Books. The DRA2 kit included field tested and revised benchmark assessment books in order to appeal more to primary-grade students. Beaver and Carter (2005) described the benchmark assessments books as ranging from level A - 16. The Reading School District used levels A - 16 for kindergarten. Books ranging from Levels A-2 have: (a) repeated words or sentence patterns; (b) simple illustrations that support the text; (c) one line of text on the left-hand page; (d) large and well spaced print; and (e) between 20 to 45 words. Books ranging from Levels 3 - 6 have: (a) simple stories that contain predictable language; (b) characters with experiences, to which children can make connections; (c) one to three lines of text located below the pictures; and (d) between 53 and 73 words. Books ranging from Levels 8 - 14 have: (a) relatable problems; (b) some events that repeat; (c) a high number of high-frequency words; (d) illustrations that help suggest the sequence of some events; (e) two to six lines of text located under the pictures; and (f) between 87 to 207 words.

Administering DRA2. The DRA2 takes about 10 - 20 minutes to administer per student. The DRA2 involved four administering steps: 1) the teacher assessed the students' reading engagement; 2) the teacher assessed the students' oral reading; 3) the teacher assessed the students' comprehension and printed language scores; and 4) the teacher analyzed the students' reading performance.

Beaver and Carter (2005) described the procedures for administering DRA2; As the student orally reads, the teacher observes the student's behaviors and notes the student's fluency, including expression and phrasing. The teacher marks and records the student's miscues on the observational guide. Additionally, the teacher notes when the student self-corrects miscues. The oral reading fluency is timed, starting with level 14. The total numbers of words in the book, minus the miscues, is divided by the total number of words, in order to determine the student's accuracy percentage. Every aspect of the DRA2 is useful. Two reasons existed for the researcher for the current study having only included the independent reading level: 1) only the DRA2 independent reading level scores are archived; the other aspects of the DRA2 are unavailable; and 2) the independent reading level aligns closely with a focus of the current research study: the students' overall ability to apply phonics skills to decoding unknown words.

Accuracy levels. The district used the corresponding accuracy percentage to determine if students were below, on, or above the kindergarten level. Table 1 gives the students' DRA2 accuracy levels. An advanced level ranged from 99 - 100% accuracy rate; an independent level ranged from a 95 - 98% accuracy rate; an instructional level range was 94% or less; an intervention level was 93% or less. The teacher discontinued a level when a student's scores were considered at the instructional or intervention level. An advanced level was considered too easy; however, the independent level was the level that the teacher used to plan instruction for the student. The researcher for the current study focused on the students' independent reading level, as determined by the students' accuracy percentages.

Table 1

DRA2 Accuracy Levels

Advanced	Independent	Instructional	Intervention
99-100%	95-98%	94%	93% or less

Corresponding levels. The researcher for the current study focused on accuracy percentage and corresponding independent reading level. Table 2 gives the students' DRA2 corresponding reading levels. For consistency purposes, the DRA2 kindergarten end-of-the-year benchmark scores were used to analyze all data in the current study. Reading School District categorized the Kindergarten DRA2 into three groups: 1) below grade level in kindergarten, whose scores ranged between A - 2; 2) on grade level in kindergarten, who scored a 3; and 3) above grade level, whose scores ranged between 4 - 16. The district required kindergarten teachers to stop testing at a level 16. If students were advanced at a level 16, then the teacher added a plus sign to indicate that the student could read ata higher level. Level 14 and 16 begin to take into account fluency rates. The fluency rates were not included in the current study because the rate was not available for levels below 14. The researcher for the current study analyzed pre- and post-KDRA2 scores. Further, the Grade1DRA2 was obtained from the beginning of first grade, and the scores were analyzed.

Table 2

DRA2 Corresponding Accuracy Levels

Below grade level	On grade level	Above grade level
A-2	3	4-16

The application of dra2 to the current research study. The DRA2 was a valid and reliable assessment tool for measuring students' abilities to apply phonics skills, yielding an oral fluency accuracy percentage and independent reading level. However, PEI (2011) cautioned that DRA2 should not be the single source of evidence about a student's reading performance, however, DRA2 was the only assessment tool used for the current research study because the researcher for the current study also used DIBELS.

Safeguards for Qualitative Component of the Current Study

Transferability. Transferability refers to the idea that everything in the study is context-bound and the goal of the research study is not to develop statements to generalize to large groups of people. Rather, the results of the studies can be used in other contexts, with certain limitations. A safeguard to help improve the transferability of the current research study was to provide a detailed description of the context, including the classroom and school (McMillan et al., 2002). The researcher for the current study provided a detailed description of the context for the research study to help improve the study's transferability.

Creditability and dependability. Creditability takes into account the complexities presented in the study that are not easily explained. Dependability is the stability of the data. Two ways for a researcher to safeguard the creditability and dependability of the research study are to include member checking the data and using a triangulation of the data (McMillan et al., 2002). The researcher for the current study used methods and data triangulation by using multiple sources of data and methods to gather information. Member checking involved the researcher keeping a data audit journal that the external member checked for accuracy purposes (Rovai et al., 2013). The

researcher for the current study maintained an audit journal and an external member checked the accuracy of the data reported.

Confirmability. Confirmability of data is the neutrality or objectiveness of data collection. A safeguard for the confirmability of the data involved the researcher for the current study identifying assumptions and biases at the beginning of the study, and using member checking and data triangulation (McMillan et al., 2002). The researcher for the current study remained open and honest about possible limitations and assumptions at the beginning of the research study to help safeguard the study's conformability.

Safeguards for Quantitative Component of the Current Study

Internal validity. Internal validity is the confidence in the functional relationship between the independent and dependent variables by taking into account extraneous variables that influence the dependent variable (McMillan et al., 2002). The researcher for the current study used pretests to compare the two groups based statistical differences, using a technique called analysis of covariance (ANCOVA) (Salkind, 2003). The test yielded results about the comparability between the two groups. Longitudinal studies help the comparability between two groups because longitudinal studies involve collecting data repeatedly over time in order to see a change in a population (Hansen et al., 2011). Further, the longitudinal study involved using more than one assessment measure. Two groups are comparable when a longitudinal study used multiple points compared across more than one type of assessment measure (Hansen et al.). Even though the two groups of students who participated in the current study were different, the two groups were comparable because the researcher assessed the two groups of students at multiple times across multiple assessment measures.

External validity. External validity involves the generalizability of the research study (McMillan et al., 2002). A convenience sample could cause problems with population validity, which is an external validity issue. The generalization the results of the convenience sample to the target population are difficult (Rovai et al., 2013). The researcher for the current study used a convenience sample so the study results could be generalized to other contexts, with certain limitations. However, naturalistic generalization or proximal similarity supports the idea that the finding can be roughly generalized to similar settings and people promoting the external validity of the research study (Rovai et al.). Therefore, as a safeguard for the current study, the researcher included a detailed explanation of the setting for the research study so other researchers could determine the naturalistic generalization. Further, if the current research study yielded results that indicated the program was effective, then in future studies, researchers may be able to replicate the current study in other contexts or settings.

Face validity. The face validity of the research study refers to the degree to which the instruments measure what they should measure (Rovai et al., 2013). The DRA2 and DIBELS were instruments matched to the purpose of the research study. The DRA2 and DIBELS were research instruments supported by research, and both instruments have been shown to be valid and reliable (PEI, 2011; University of Oregon, 2012).

Reliability and validity of DIBELS LNF. Research supported the reliability and validity of DIBELS LNF measures. Good et al. (2004) explained that their research study examined the reliability and validity of DIBELS over a four-year span. The study included 10 groups consisting of kindergarten through third grade. The results of the study consistently demonstrated that the kindergarten DIBELS LNF was reliable, valid,

and predictive of students' later performance in first, second, and third grades. The researchers demonstrated that an alternate-form reliability of LNF is .88 in kindergarten. The median criterion-reflated validity of LNF with the Woodcock-Johnson Psycho-Educational Battery-Revised readiness cluster standard score is .70 in kindergarten. The predictive validity of kindergarten LNF with first-grade Woodcock-Johnson Psycho-Educational Battery-Revised Reading Cluster standard score is .65 and .71 with first-grade reading (Good et al., 2002). Therefore, since the research studies supported the validity and reliability of the DIBELS LNF, the measure has been shown to be a reliable and valid assessment measure for the current research study in examining kindergarten students' understanding of letter recognition fluency.

Reliability and validity of DIBELS NWF-CLS. Research has supported the reliability and validity of DIBELS NWF measures. The results of Good et al. (2004) consistently demonstrated that the kindergarten DIBELS NWF were reliable, valid, and predictive of students' later performance in first, second, and third grades. Their results demonstrated an alternate-form reliability for NWF in January of first grade is .83. The concurrent criterion-validity of DIBELS NWF with the Woodcock-Johnson Psycho-Educational Battery-Revised Readiness Cluster score is .36 in January and .59 in February of first grade. The predictive validity of DIBELS NWF in January of first grade is .82, and in May of second grade is .60. The Woodcock-Johnson Psycho-Educational Battery Total Reading Cluster score is .66 (Good et. al.). Therefore, since research has supported the reliability and validity of the DIBELS NWF, the measure was shown to be a reliable and valid assessment measure for the current research study in examining kindergarten students' understanding of letter-sound or decoding fluency.

Training and rater-expert reliability. In the Reading School District, the classroom teacher administered and scored the DRA2 for the majority of the students in the classroom. If students received reading support, then the DRA2 were administered by the reading specialist or reading tutor who worked with the student. Training for administering the DRA2wais important because it ensured accuracy and reliability of the results. Further, it is assumed that the person administering the test followed the administering and scoring guidelines to ensure the accuracy and reliability of the results (PEI). For the current research study, the kindergarten teacher who participated in the study administered and scored the DRA2. However, the teacher was fully trained in administering and scoring the DRA2. The teacher received training during a summer reading clinic as a part of the teacher's reading specialist certification program, and Masters of Language Arts and Literacy Program. The teacher watched demonstrations of the administration and scoring of the DRA2 through video clips and workshop demonstrations. Further, training involved attending workshops or seminars. The reading clinic provided on-site practice while Literacy Coaches watched and provided direct feedback to the teacher/reading specialist who was a part of the research study. Therefore, the teacher's extensive training helped ensure accurate and reliable DRA2 results.

The DRA2 requires judgments in scoring results. Two different raters should assign similar or the same score when evaluating identical work. Inter-rater reliability involves checking how two or more raters agree on the assessment of a student's work (PEI). In the current research study, the test was administered mostly by one person, as opposed to a team. Therefore, the teacher took three precautions to ensure accurate

DRA2 scores: 1) the teacher had another reading specialist spot check the DRA2 scores using a different benchmark text within the same reading level; the reading specialist's scores were consistent with the teacher's scores; 2) the teacher had another reading teacher spot check the DRA2 scores using a different running record program, the Rigby Kit; the reading teacher's scores were consistent with the teacher's scores; and 3) the teacher cross-checked the end of kindergarten DRA2 scores with the beginning of first grade DRA2 scores; the first grade DRA2 scores were consistent with the kindergarten teacher's scores. Further, some of the kindergarten teachers were one or two levels lower than what was reported by the first grade teachers. Therefore, the teacher who participated in the current study used two rater-experts, and one cross-check across grade level to ensure the accuracy and reliability of the reported DRA2 kindergarten scores.

Reliability and validity of DRA2. Two decades of research have demonstrated that DRA2 is a reliable and valid assessment tool for determining a student's independent reading level (PEI, 2011). "Triangulation of multiple forms of reliability analyses that were conducted show that the DRA2 is a reliable measure in that it produces stable, consistent, results overtime, different raters, and different samples of work or content" (PEI). Pearson Education, Inc. (2011) provided four supporting reliability research studies of DRA2: 1) Cronbach's alpha was used as an indicator of internal consistency, demonstrating high reliabilities of the DRA2 oral fluency and comprehension scores; 2) parallel equivalency reliability was examined using a MANCOVA with a confidence level of .05; the test demonstrated little or no differences between passages, so the passages at each level could be used as interchangeable; 3) test-retest reliability was analyzed when the test was administered two different times with statically significant

differences between the scores with .05 confidence level; and 4) inter-rater reliability involved the percent of agreement among multiple raters; Kappa values of .57 for oral fluency and .65 for comprehension indicated significant agreement. Therefore, the DRA2 was shown to be a reliable assessment tool to use in the current research study. Research results supported the content-related validity, criterion-related validity, and construct validity of the DRA2 (PEI, 2011). Pearson Education, Inc. (2011) provided five research studies suggesting validity of the DRA2: 1) the content-related validity was built-in during the development of the DRA2 because the DRA2 is based on what research defines as characteristics and behaviors of a good reader; 2) the vast majority of teachers and reading specialists who completed teacher rating scales reported that the DRA2 had face validity (DRA2 measured what it was supposed to measure); 3) three different work groups of teachers and reading specialists helped establish consistent benchmarks across grade levels; 4) criterion-related validity involves the measure predicting performance on some other significant measure; the DRA2 and Gray's Oral Reading Test (GORT-4) had no significant difference with a correlation coefficient ranging from .6 to .76; and 5) predicative validity was analyzed between the Group Reading Assessment and Diagnostic Evaluation (GRADE) and DRA2 results; the two assessments did not have a significant difference, with a correlation coefficient ranging from .51 to .89. Therefore, the DRA2 was shown to be a valid assessment tool to be used in the current research study.

Quantitative Data Analysis

After the archived data were obtained from the school's reading specialist for the 2011 - 2013 school years, the data were organized and analyzed based on the four

hypotheses. The Analysis of Covariance (ANCOVA), Multivariate Analysis of Covariance (MANCOVA), and factorial Multivariate Analysis of Covariance (MANCOVA) tests were used to analyze the differences of the four dependent variables -- KDRA2, KDIBELS, Grade1DRA2, and Grade1DIBELS NWF-CLS -- between the two levels of the independent variables, control and experimental groups. The dependent variables and independent variables were aligned with the research questions and hypotheses. The testing tools used to analyze data were appropriate for use in the current research study because they took into account the three covariates, PreKDRA2, PReKDIBELS LNF, and PreKDIBELS NWF-CLS, controlling for the differences between the control and experimental groups. The researcher for the current study conducted the ANCOVA, MANCOVA, and factorial MANCOVA using the SPSS 20.0 computer statistical software program. Table 3 gives the study variables and statistical tests used to evaluate the four research questions and supporting research questions.

ANCOVA. ANCOVA test were used to examine $H1_{0,}$ $H1_{a,}$ $H3_{0,}$ and $H3_{a.}$ An ANCOVA test consists of dependent variables, independent variables, and covariates. The ANCOVA was used to analyze dependent variables-PostKDRA2and Grade1DRA2. The two levels of the independent variable consisted of the control and experimental groups. The ANCOVA was used to analyze the covariate-PreKDRA2.

MANCOVA. The MANCOVA was used to examine $H2_{0,}$ $H2_{a,}$ $H4_{0}$, and $H4_{a}$. A MANCOVA test consists of dependent variables, independent variables, covariates, and sub-constructs of the dependent variables. The MANCOVA was used to analyze PostKDIBELS LNF, PostKDIBELS NWF-CLS, Grade1DIBELS LNF, Grade1DIBELS NWF-CLS. The two levels of the independent variable consisted of the control and

experimental groups. The MANCOVA was used to analyze the covariates-PreKDIBELS LNF and PreKDIBELS NWF-CLS.

Table 3

Study Variables and Statistical Tests Used to Evaluate Four Study Research Questions

Research question	Dependent variable	Independent variable	Covariate	Moderator	Statistical test
1	Kindergarten Post-DRA2	Reading Group	Kindergarten Pre-DRA2		ANCOVA
1a	Kindergarten Post-DRA2	Reading Group	Kindergarten Pre-DRA2	Gender	Moderated ANCOVA
1b	Kindergarten Post-DRA2	Reading Group	Kindergarten Pre-DRA2	Speech Language	Moderated ANCOVA
2	Kindergarten Post-DIBEL LNF and NWF-CLS	Reading Group	Kindergarten Pre-DIBEL LNF and NWF-CLS		MANCOVA
2a	Kindergarten Post-DIBEL LNF and NWF-CLS	Reading Group	Kindergarten Pre-DIBEL LNF and NWF-CLS	Gender	Moderated MANCOVA
2b	Kindergarten Post-DIBEL LNF and NWF-CLS	Reading Group	Kindergarten Pre-DIBEL LNF and NWF-CLS	Speech Language	Moderated MANCOVA
3	1st Grade DRA2	Reading Group	Kindergarten Post-DRA2		ANOVA
3a	1st Grade DRA2	Reading Group	Kindergarten Post-DRA2	Gender	Moderated MANCOVA
3b	1st Grade DRA2	Reading Group	Kindergarten Post-DRA2	Speech Language	Moderated MANCOVA
4	1st Grade DIBEL LNF and NWF-CLS	Reading Group	Kindergarten Post-DIBEL LNF and NWF-CLS		MANCOVA
4a	1st Grade DIBEL LNF and NWF-CLS	Reading Group	Kindergarten Post-DIBEL LNF and NWF-CLS	Gender	Moderated MANCOVA
4b	1st Grade DIBEL LNF and NWF-CLS	Reading Group	Kindergarten Post-DIBEL LNF and NWF-CLS	Speech Language	Moderated MANCOVA

The DIBELS scores were analyzed using an MANCOVA because it measures the sub- constructs, LNF and NWF-CLS, of the dependent variables, KDIBELS and Grade1DIBELS. The MANCOVA was used because the research study has to account for sub-constructs (Sproull, 1995). A repeated ANCOVA would not have been

appropriate because the sub-constructs, LNF and NWF-CLS, are smaller subtests that are contained within the dependent variable, DIBELS.

Factorial MANCOVA. The factorial MANCOVA was used to examine $H1A_0$. HIA_a, $H1B_0$, $H1B_a$, $H2A_0$,$H2A_a$, $H2B_0$, and $H2B_a$. The sub-hypotheses involved an exploration of the moderating variables, gender and speech language services. The moderating variables were analyzed as sub-hypotheses for KDRA2, KDIBELS LNF, KDIBELS NWF-CLS, Grade1DRA2, Grade1DIBELS LNF, and Grade1DIBELS NWF-CLS.

Qualitative Data Analysis

The researcher for the current study used one research question for the study's qualitative component: How do the kindergarten students' perceptions of reading compare between the control and experimental groups? The question was explored further to determine what motivates, intrinsic or extrinsic, the students to read. The learning profile data were coded for emerging themes. The data were color-coded to match a corresponding color-coded legend developed based on the emerging themes. The emerging themes helped describe the research question because an analysis of the categories provided information about how students perceived reading between the control and experimental groups.

Research has demonstrated that students who are motivated to read demonstrated a greater cognitive ability (Schiefele, Schaffner, Moller, & Wigfield, 2012). Individuals who repeatedly show an interest in reading develop into habitual and lifelong readers. Extrinsic reading motivation involves reading for an incentive. For example, a student might read in order to obtain a good grade, however, intrinsic reading motivation

involves reading because it is enjoyable (Schiefele et al., 2012). Teachers need to help foster intrinsic reading motivation in students. Research has shown that children who are motivated and love reading later become lifelong readers (Walker, 2013). Further, research has demonstrated that children who have a positive perception of learning perform better in reading and math (Coople & Bredekamp, 2009). The premise of Ludus Reading is that students will enjoy reading, however, the current research study was necessary to determine the effectiveness of the new reading program in terms of students' perceptions of reading.

Summary of Chapter 3

A mixed method design was appropriate for the current research study because quantitative and qualitative data provided more information about the overall effectiveness of a new instructional program (Creswell, 2008). The population for the research study included kindergarten students in the United States, and the sample for the study included students attending kindergarten and first grade in the Reading School District during the 2011 - 2013 school years. Ethical and validity safeguards were built into the current research study to protect the participants and school involved in the study and to ensure the study's validity. The experimental and control groups received the same core instruction, and over 1,000 lesson plans were documented and used with both groups. However, the experimental group received Ludus Reading, whereas the control group did not receive Ludus Reading. The research study involved exploring archived quantitative, DIBELS and DRA2 scores, and qualitative, learning profile, data to examine the difference in kindergarten students' reading performance and perceptions between the control and experimental groups. The data collection techniques aligned with the research

design and the purpose of the research study. The quantitative data were analyzed using ANCOVA, MANCOVA, and factorial MANCOVA tests. The qualitative data were explored by emerging categories that evolved from the coded data between the control and experimental groups. Chapter 4 will include an overview the data analysis and results.

Chapter 4

Results

> My passion as a kindergarten teacher and reading specialist is to teach kindergarten students to learn how to read effectively while enjoying the process. Current reading instruction is limiting in a standards-driven era of accountably, and basal (textbook) series provide teachers with scripted one-size-fits-all ways of learning to read. Kindergarten students are naturally curious and they need fun and effective phonics instruction. To fulfill the need, I developed Ludus Reading, which combines reading, play, and technology to differentiate reading instruction. The new program was implemented and data were archived, but the data were never analyzed to determine if the program increased students' reading performance and perceptions of reading. The data were analyzed to determine the effectiveness of Ludus Reading. I knew that if the program was ineffective, then revisions or a new reading program may be necessary. However, I was delighted to discover that the results indicated that Ludus Reading was effective, so it is my hope that the program can be used to help more students take off like shooting stars! The possibilities are endless for a student who can read, and for a student who enjoys reading.
>
> —Jessica D. Redcay

The mixed-method research study involved using archived quantitative and qualitative data to examine the effectiveness of the new reading program, Ludus Reading. The quantitative results yielded information about kindergarten reading performance, whereas, the qualitative results yielded information about kindergarten students'

perceptions of reading. At the beginning of the chapter, a description of the data screening is provided. Then the quantitative results are reported, and the results are organized around the four hypotheses and sub-hypotheses of the dominant quantitative, quasi-experimental pre-post, longitudinal, retrospective design. Further, the section includes an explanation of how inferential statistics were used to test the hypotheses, and how the null hypotheses were accepted or rejected based on the findings. Next, Chapter 4 includes a description of the qualitative results that are organized around the main research question of the embedded qualitative, historical, explanatory, case study design.

Quantitative Results of the Current Research Study

Data screening. Before the hypotheses were assessed, the data were screened for missing data, univariate, and multivariate outliers. The data were screened for univariate outliers by transforming raw scores to z-scores and comparing z-scores to a critical value of +/- 3.29, $p < .001$ (Tabachnick & Fidell, 2007). Z-scores that exceeded a critical value were more than three standard deviations away from the mean and, thus, represented outliers. The distributions were evaluated, and two cases with univariate outliers were found and were removed from further analyses. Thus, 75 responses from participants were received and 73 were evaluated by Research Questions 1 - 4 ($n = 73$). The current research study included 75 responses, 12 responses were unavailable because students moved in and moved out during the time of the study. Of the 75 responses, 73 were used for the study because two responses were univariate outliers. Therefore, the sample size of 73 (n=73) demonstrated statistically significant results with an alpha score of .05. Further, before Research Questions 1 - 4 were analyzed, basic parametric assumptions were assessed. That is, for the dependent and covariate variables, Pre- and post-KDRA2,

pre- and pos- KDIBELS LNF, pre- and post-KDIBELS NWF, and first grade DRA2, DIBELS LNF, and DIBELS NWF, assumptions of normality, linearity, homoscedasticity of variance, and multicollinearity were evaluated, and the assumptions were met (see Appendices B-C for the results of the basic parametric assumptions tests).

H10, and H1a results using ANCOVA. To test H1, the researcher analyzed the data using an ANCOVA test because the ANCOVA consists of dependent variables, PostKDRA2, between the two independent variables, control and experimental groups, as the covariates, PreKDRA2, control for the natural differences between the two groups.

- For $H1_0$ there was no difference in the PostKDRA2 scores between the group receiving Ludus Reading and the group not receiving Ludus Reading.
- For $H1_a$ there was a difference in the PostKDRA2 scores between the group receiving Ludus Reading and the group not receiving Ludus Reading.

For H1, the researcher analyzed the data using an ANCOVA test. The results indicated that a significant difference in PostKDRA2 scores did exist between reading groups after controlling for pre-KDRA2 scores. The ANCOVA yielded a main effect for the control and experimental group, F (1, 70) = 15.01, $p < .001$, such that the average mean was significantly higher post-KDRA2 mean score for the experimental group (M = 9.25, SD = 5.11) than the control group (M = 5.07, SD = 4.25), after controlling for pretest scores. The effect size was 17% (*partial eta-squared* = .17). Accordingly, the null hypothesis for Research Question 1 was rejected (see Table 4 and Figure 6 for results for Hypothesis 1).

Table 4

Model Summary of ANCOVA Analysis for Hypothesis 1

Source	Type III sum of squares	df	Mean square	*F*	Sig.	Partial eta squared	Observed power
Corrected Model	1253.26	2	626.63	73.71	< .001	.67	1.00
Intercept	150.86	1	150.86	17.74	< .001	.20	.98
Pre KDRA2	939.72	1	939.72	110.55	< .001	.61	1.00
Reading Group	127.63	1	127.63	15.01	< .001	.17	.96
Error	595.06	70	8.50	—	—	—	—
Total	5328.00	73	—	—	—	—	—
Corrected Total	1848.32	72	—	—	—	—	—

Note. Dependent Variable: Post KDRA2, (-) denotes no computation

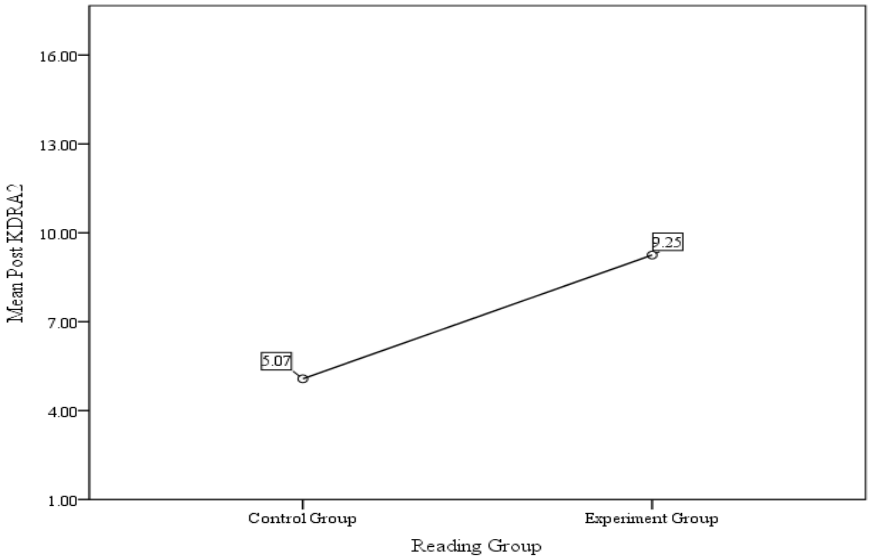


Figure 6. Means plot of Post KDRA2 scores by reading groups.

H1A0, and H1Aa results using factorial MANCOVA. To test H1A, the researcher analyzed the data using a factorial MANCOVA test because the factorial MANCOVA analyzes sub-research question, and sub-hypotheses to account for the moderating variable of gender.

- For $H1A_0$ there was no difference in the Post Kindergarten DRA2 (PostKDRA2) scores between the control and experimental groups in terms of the moderating variable of gender.
- For $H1A_a$ there was a difference in the PostKDRA2 scores between the control and experimental groups in terms of the moderating variable of gender.

The results of the factorial MANCOVA indicated that gender did not moderate a significant difference between the experimental and control groups. The results of the moderated ANCOVA test revealed that gender did not moderate a significant difference in post-KDRA2 scores between reading groups (experimental and control) after controlling for pre-KDRA2 scores, F (1, 68) = 0.61, p = .43. The effective size was 9% (*partial eta*-squared=.009). Consequently, the null hypothesis for Research Question 1A was accepted. That is, although there was a significant difference in post-KDRA2 scores between the experimental and control groups ($p < .001$), gender did not have a moderating effect. Accordingly, the null hypothesis for Research Question 1A was accepted (see Figure D1 and Table D1 in Appendix D for data analysis information for RQ1A).

H1B0, and H1Ba results using factorial MANCOVA. To test H1B, the researcher analyzed the data using a factorial MANCOVA test because the factorial MANCOVA analyzes sub-research question, and sub-hypotheses to account for the moderating variable of SLS.

- For $H1B_0$ there was no difference in the PostKDRA2 scores between the control and experimental groups in terms of the moderating variable of SLS.

- For $H1B_a$ there was a difference in the PostKDRA2 scores between the control and experimental groups in terms of the moderating variable of SLS.

The results of the factorial MANCOVA indicated that SLS did not moderate a significant difference in post-KDRA2 scores between reading groups (experimental and control) after controlling for pre-KDRA2 scores. Results from the moderated ANCOVA test SLS did not moderate a significant difference in post-KDRA2 scores between reading groups (experimental and control) after controlling for pre-KDRA2 scores, F (1, 68) = 0.17, p = .68. The effect size was 3% (*partial eta-squared* = .003). Therefore, the null hypothesis for Research Question 1B was accepted. That is, although there was a significant difference in post-KDRA2 scores between the experimental and control groups (p = .02), SLS did not have a moderating effect (see Figure D2 and Table D2 in Appendix D for data analysis information for RQ1B).

H20, and H2a results using MANCOVA. To test H2, the researcher analyzed the data using a MANCOVA test, because the MANCOVA consists of dependent variables (PostKDIBELS), subconstructs of dependent variables, PostKDIBELS LNF and PostDIBELS NWF-CLS, between the two independent variables, control and experimental group, as the covariates, PreKDIBELS, PreKDIBELS LNF, and PreKDIBELS NWF-CLS, control for the natural differences between the two groups.

- For $H2_0$ there was no difference in the PostKDIBELS LNF and NWF-CLS scores between the group receiving Ludus Reading and the group not receiving Ludus Reading. $H2_a$ there was a difference in the PostKDIBELS LNF and NWF-CLS scores between the group receiving Ludus Reading and the group not receiving Ludus Reading.

The results of the MANCOVA indicated that significant difference did exist between groups on a model containing two dependent variables after controlling for pre-KDIBSL LNF and NWF-CLS scores. The multivariate analysis examination of the individual between-subject effects revealed that only one of the main effects was significant. Subsequently, when the dependent variables were considered separately, significant differences between the experimental and control groups were only found in post-KDIBELS NWF-CLS scores, F (1, 69) = 6268.69, *Wilks Lambda* = 0.68, $p < .001$. That is, the experimental group had a significantly higher post-KDIBELS NWF-CLS mean score (M = 53.31, SD = 21.58) than the control group (M = 32.20, SD = 18.99), after controlling for pre-KDIBELS NWF-CLS scores. No significant difference in Post-KDIBELS LNF scores (p = .79) existed between the experimental (M = 53.63, SD = 17.01) and control groups (M = 51.73, SD = 14.04). A model summary for the tests of between-subjects effects is displayed in Table 5 for means plots of the dependent variables by reading groups. Accordingly, the null hypothesis for Research Question 2 was rejected (see Table 6 for a model summary of the MANCOVA analysis) (see Figures E1 and E2 in Appendix E for means plots of the dependent variables by reading groups).

Table 5

Summary of Multivariate Tests Derived from MANCOVA Analysis of Hypothesis 2

Effect	Wilks' statistic	*F*	Hypothesis *df*	Error *df*	Sig.	Partial eta-squared
Intercept	0.44	41.68	2	68	< .001	.55
Pre KDIBELS LNF	0.77	9.70	2	68	< .001	.22
Pre KDIBELS NWF-CLS	0.63	19.45	2	68	< .001	.36
Reading Group	0.68	15.73	2	68	< .001	.31

Note. Design: Intercept + Post KDIBELS LNF + Post KDIBELS NWF-CLS + Reading Group

Table 6

Model Summary for Tests Between-Subject Effects from MANCOVA Analysis of Hypothesis 2

Dependent variable	Type III sum of squares	*df*	Mean square	*F*	Sig.	Partial eta-squared
Post KDIBELS LNF	7.61	1	7.61	0.06	.79	.001
Post KDIBELS NWF-CLS	6268.69	1	6268.69	28.52	< .001	.29

H2A0, and H2Aa results using factorial MANCOVA. To test H2A, the researcher analyzed the data using a factorial MANCOVA test because the factorial MANCOVA test was used to analyze sub-research questions and sub-hypotheses to account for the moderating variable of gender.

- For $H2A_0$ there was no difference in the PostKDIBELS LNF and NWF-CLS scores between the control and experimental groups in terms of the moderating variable of gender.
- For $H2A_a$ there was a difference in the PostKDIBELS LNF and NWF-CLS scores between the control and experimental groups in terms of the moderating variable of gender.

The results of the factorial MANCOVA test indicated that gender did not moderate a significant difference in post-KDIBELS LNF or Post-KDIBELS NWF-CLS scores between reading groups, experimental and control, after controlling for pre-KDIBELS LNF and NWF-CLS scores. The main effect of gender between the two groups yielded a F ratio of F (2, 66) = 0.92, *Wilks' Lambda* = 0.97, p = .40, indicating that gender did not moderate a significant difference in post-KDIBELS scores between

reading groups, experimental and control, after controlling for pre-KDIBELS scores. The effect size was 27% (*partial eta-squared* = .02). Consequently, the null hypothesis for Research Question 2A was accepted.

In addition to the multivariate analysis, examination of the individual between-subject effects revealed that none of the main effects were significant. When the dependent variables were considered separately, no significant differences were found in post-KDIBELS LNF and NWF-CLS scores between experimental and control groups after moderating for gender and controlling for pre-KDIBELS LNF and NWF-CLS scores (p = .18 and .51 respectively) (see Tables E1- E2 and Figures E3 - E4 in Appendix E for data analysis information for RQ2A).

H2B0, and H2Ba results using factorial MANCOVA. To test H2B, the researcher analyzed the data using a factorial MANCOVA test because the factorial MANCOVA test was used to analyze sub-research questions and sub-hypotheses to account for the moderating variable of SLS.

- For $H2B_0$ there was no difference in the PostKDIBELS LNF and NWF-CLS scores between the control and experimental groups in terms of the moderating variable of SLS.
- For $H2B_a$ there was a difference in the PostKDIBELS LNF and NWF-CLS scores between the control and experimental groups in terms of the moderating variable of SLS.

The results of the factorial MANCOVA test indicated that speech and language services did not moderate a significant difference in post-KDIBELS LNF or Post-KDIBELS NWF-CLS scores between reading groups, experimental and control, after

controlling for pre-KDIBELS LNF and NWF-CLS scores. The main effect of SLS between the two groups yielded a F ratio of F (2, 66) = 0.07, *Wilks' Lambda* = 0.99, p = .92, indicating that SLS did not moderate a significant difference in post-KDIBELS scores between reading groups, experimental and control, after controlling for pre-KDIBELS scores. The effect size was 2% (*partial eta-squared* = .002). Consequently, the null hypothesis for Research Question 2B was accepted.

In addition to the multivariate analysis, examination of the individual between-subject effects revealed that none of the main effects were significant. That is, when the dependent variables were considered separately, no significant differences were found in post-KDIBELS LNF and NWF-CLS scores between experimental and control groups after moderating for SLS and controlling for pre-KDIBELS LNF and NWF-CLS scores (p = .93 and .70 respectively) (see Tables E3 - E4 and Figures E5 – E6 in Appendix E for data analysis information for RQ2B).

$H3_0$, and $H3_a$ results using ANCOVA

To test H3, the researcher analyzed the data using an ANCOVA test because the ANCOVA consists of dependent variables, Grade1DRA2, between the two independent variables, control and experimental groups, as the covariates, PostKDRA2, control for the natural differences between the two groups.

- For $H3_0$ there was no difference in the Grade1DRA2 scores between the group receiving Ludus Reading and the group not receiving Ludus Reading.
- For $H3_a$ there was a difference in the Grade1DRA2 scores between the group receiving

Ludus Reading and the Group Not Receiving Ludus Reading.

The results of the ANCOVA indicated that a significant difference in Grade 1 DRA2 scores did not exist between reading groups. The ANCOVA yielded a main effect for the control and experimental group, F (1, 71) = 2.98, p = .08, such that the average mean was not significantly higher post KDRA2 mean score for the experimental group. Therefore, the experimental groups' score was not significantly higher Grade 1 DRA2 mean score (M = 8.66, SD = 5.67) than the control group (M = 6.49, SD = 5.02). Therefore, the null hypothesis for Research Question 3 was accepted (see Table F1 and Figure F1 in Appendix F for data analysis information for RQ3).

H3A0, and H3Aa results using factorial MANCOVA. To test H3A, the researcher analyzed the data using a factorial MANCOVA test because the factorial MANCOVA test was used to analyze sub-research questions and sub-hypotheses to account for the moderating variable of gender.

- For $H3A_0$ there was no difference in the Grade1DRA2 scores between the control and experimental groups in terms of the moderating variable of gender.
- For $H3A_a$ there was a difference in the Grade1DRA2 scores between the control and experimental groups in terms of the moderating variable of gender.

The results of the factorial MANCOVA test indicated that gender did not moderate a significant difference in Grade1DRA2 scores between reading groups, experimental and control. The main effect of gender between the two groups yield an F ratio of F (3, 69) = 0.08, p = .77, indicating that gender did not moderate a significant

difference in post-Grade1DRA2 scores between reading groups, experimental and control, after controlling for post-KDRA2 scores. The effect size was 1% (*partial eta-squared* = .001). Consequently, the null hypothesis for Research Question 3A was accepted (see Table F2 and Figure F2 in Appendix F for data analysis information for RQ3A).

H3B0, and H3Ba results using factorial MANCOVA. To test H2B, the researcher analyzed the data using a factorial MANCOVA test because the factorial MANCOVA test was used to analyze sub-research questions and sub-hypotheses to account for the moderating variable of SLS.

- For $H3B_0$ there was no difference in the Grade1DRA2 scores between the control and experimental groups in terms of the moderating variable of SLS.
- For $H3B_a$ there was a difference in the Grade1DRA2 scores between the control and experimental groups in terms of the moderating variable of SLS.

The results of the factorial MANCOVA test indicated that SLS did not moderate a significant difference in Grade 1 DRA2 scores between reading groups, experimental and control. The main effect of SLS between the two groups yield an F ratio of F (3, 69) = 0.004, p = .95, indicating that gender did not moderate a significant difference in post-Grade1DRA2 scores between reading groups, experimental and control, after controlling for post-KDRA2 scores*, partial eta-squared* < .001. Consequently, the null hypothesis for Research Question 3B was accepted (see Table F3 and Figure F3 in Appendix F for data analysis information for RQ3B).

H40, and H4a results using MANCOVA. To test H4, the researcher analyzed the data using a MANCOVA test because the MANCOVA consists of dependent

variables, Grade1DIBELS, sub-constructs of dependent variables, Grade1DIBELS LNF and Grade1DIBELS NWF-CLS, between the two independent variables, control and experimental groups, as the covariates, PostKDIBELS, PostKDIBELS LNF, and PostKDIBELS NWF-CLS, control for the natural differences between the two groups.

- For $H4_0$ there was no difference in the Grade1DIBELS LNF and NWF scores between the group receiving Ludus Reading and the group not receiving Ludus Reading.
- For $H4_a$ there was a difference in the Grade1DIBELS LNF and NWF-CLS scores between the group receiving Ludus Reading and the group not receiving Ludus Reading.

The results of the MANCOVA indicated that a significant difference did exist between groups on Grade 1 DIBELS NWF-CLS, but a significant difference did not exist between groups on Grade 1 DIBELS LNF. The multivariate analysis examination of the individual between-subject effects revealed that only one of the main effects was significant. As a result, when the dependent variables were considered separately, significant differences between experimental and control groups were only found in Grade 1 DIBELS NWF-CLS scores, F (1, 71) = 3774.76, p = .01. Therefore, the experimental group had a significantly higher Grade 1 DIBELS NWF-CLS mean score (M = 50.69, SD = 23.89) than the control group (M = 36.20, SD = 24.11). No significant difference in Grade 1 DIBELS LNF scores (p = .82) existed between the experimental (M = 52.94, SD = 10.36) and control groups (M = 51.59, SD = 14.21). Accordingly, the null hypothesis for Research Question 4 was rejected for DIBELS NWF-CLS and the null

hypothesis was accepted for DIBELS LNF (see Tables G1 – G2 and Figures G1 – G2 in Appendix G for data analysis information for RQ4).

RQ4A, H4A0, and H4Aa results using factorial MANCOVA. To test H4A, the researcher analyzed the data using a factorial MANCOVA test because the factorial MANCOVA test was used to analyze sub-research questions and sub-hypotheses to account for the moderating variable of gender.

- For $H4A_0$ there was no difference in the Grade1DIBELS LNF and NWF-CLS scores between the control and experimental groups in terms of the moderating variable of gender.
- For $H4A_a$ there was a difference in the Grade1DIBELS LNF and NWF-CLS scores between the control and experimental groups in terms of the moderating variable of gender.

The results of the factorial MANCOVA test indicated that gender did not moderate a significant difference in Grade 1 DIBELS LNF or Grade 1 DIBELS NWF-CLS scores between reading groups, experimental and control. The main effect of gender between the two groups yield an F ratio of F (2, 68) = 0.22, *Wilks' Lambda* = 0.99, p = .79, indicating that the gender did not moderate a significant difference in post Grade1DRA2 scores between reading groups, experimental and control, after controlling for post-KDRA2 scores. The effect size was 7% (*partial eta-squared* = .007). Consequently, the null hypothesis for Research Question 4A was accepted.

In addition to the multivariate analysis, examination of the individual between-subject effects revealed that none of the main effects were significant. Namely, when the dependent variables were considered separately, no significant differences were found in

Grade 1 DIBELS LNF and NWF-CLS scores between experimental and control groups after moderating for gender (p = .56 and .97 respectively) (see Tables G3 – G4 and Figures G3 – G4 for data analysis information for RQ4A).

H4B0, and H4Ba results using factorial MANCOVA. To test H4B, the researcher analyzed the data using a factorial MANCOVA test because the factorial MANCOVA test was used to analyze sub-research questions and sub-hypotheses to account for the moderating variable of SLS.

- For $H4B_0$ there was no difference in the Grade1DIBELS LNF and NWF-CLS scores between the control and experimental groups in terms of the moderating variable of SLS.
- For $H4B_a$ there was a difference in the Grade1DIBELS LNF and NWF-CLS scores between the control and experimental groups in terms of the moderating variable of SLS.

The results of the factorial MANCOVA test indicated that the moderated MANOVA test revealed that SLS did not moderate a significant difference in Grade 1 DIBELS LNF or Grade 1 DIBELS NWF-CLS scores between reading groups, experimental and control. The main effect of SLS between the two groups yield an F ratio of F (2, 68) = 1.01, *Wilks' Lambda* = 0.97, p = .37, indicating that the gender did not moderate a significant difference in post-Grade1DRA2 scores between reading groups, experimental and control, after controlling for post-KDRA2 scores. The effect size was 29% (*partial eta-squared* = .02). Accordingly, the null hypothesis for Research Question 4B was accepted.

In addition to the multivariate analysis examination of the individual between-subject effects revealed that none of the main effects were significant. Specifically, when the dependent variables were considered separately, no significant differences were found in Grade 1 DIBELS LNF and NWF-CLS scores between experimental and control groups after moderating for SLS (p = .85 and .20 respectively) (see Tables G5 – G6 and Figures G5 – G6 in Appendix G for data analysis information for RQ4B).

Qualitative Results of the Current Research Study

The researcher for the current study used an embedded qualitative, historical, explanatory, case study design to explore one research question: How do the kindergarten students' perceptions of Ludus Reading compare between the control and experimental groups? The qualitative component of the research study involved an exploration of archived dictated students' responses to two questions: (Q1) How do you feel about reading; and (Q2) What was your favorite part of reading? The students were asked the questions at the end of the year, thus, their responses of reading reflected their perceptions from the school year. The researcher coding the students' responses to develop emerging themes used to describe the students' perceptions of reading program between the control and experimental groups.

The qualitative data included 75 responses to two open-ended questions from students' archived learning profile data. Each response was viewed as a single incident. Common themes were identified across the data. Creswell (2009) explained that the process of qualitative data analysis involves preparing the data for analysis, and through different analysis, developing a deeper understanding of the data to make interpretation about the data's larger meaning. The first level of identification occurred during the

initial review of responses. Upon receiving the responses, each was read, data were analyzed, and coding was conducted.

Categories of students' feelings about reading. Students' open-ended, dictated responses to Q1 (How do you feel about reading?) were explored through thematic coding. Categories were used to describe students' feelings about reading because the students responded to the question using emotion words. Both groups responded using neutral or positive emotion words to describe reading. Nonetheless, the intensity of the emotion words used to describe reading differed between the two groups. McLaren (2012) explained differing intensity levels of happiness, which ranges between soft, mood state, and intense happiness. McLaren (2012) conducted a cross-analysis between the words used to describe each intensity level of happiness and the students' responses, and three primary themes emerged. Emotion words used to describe reading were categorized as intense happiness, soft happiness, and unable to describe emotions. Examples of intense happiness included responses that described reading as fun, or an activity that students loved. Examples of soft happiness included responses that described reading as okay, good, or an activity that students liked. Examples of students unable to describe emotions included students responding by stating, "I don't know." Therefore, subthemes of specific responses were categorized under the soft happiness and intense happiness responses. The sub-categories for soft happiness included okay, good, and like, whereas the sub-categories for intense happiness include fun and love.

The results indicated that students in the experimental group used intense happiness words to describe reading (16 students, 50%), whereas students in the control group did not use intense happiness words to describe reading (0 students, 0%). The

results indicated that both groups -- experimental (14 students, 44%) and control (34 students, 80%) -- used soft happiness words to describe reading. More students in the control group (8 students, 20%) were unable to describe their reading emotions, whereas fewer students in the experimental group were unable to describe their reading emotions (2 students, 6%). Therefore, the qualitative data for Q1 supported the idea that students in the experimental group had higher perceptions of reading because students were more descriptive of their feelings about reading, and students used stronger happiness words to describe their feelings about reading when compared to the control group (see Table 7 for a comparison of the control and experimental groups based on the categories that emerged for Q1).

Table 7

Frequency of Themes for Question 1 by Group

	Groups	
Themes and subthemes	Control	Experimental
Intense happiness	0 (0%)	16 (50%)
Fun	0	7
Love	0	9
Soft happiness	34 (80%)	14 (44%)
Okay	5	4
Good	18	5
Like	11	5
Unable to describe emotions	8 (20%)	2 (6%)

Categories of students' favorite part of reading. Students' open-ended, dictated responses to Q2 (What is your favorite part of reading?) were explored through thematic coding. The themes encompassing the responses related to two reading theories. Schema Theory involves the idea that students actively construct their schema as they learn to read (Tracey & Morrow, 2006). Students lacking phonics skills have limited schema

about reading. Rosenblatt's Transactional Reading Theory involves the idea that students' responses to reading are efferent (fact-orientated) and can later shift to aesthetic responses (personally-emotionally orientated) (Tracey & Morrow). The three themes used to explain students' favorite part of reading included aesthetic, limited schema, and unable to describe. Students' responses categorized as aesthetic included students making personal or emotional connections to the process of reading. Examples of aesthetic responses included students enjoying the process of learning new things from books and students enjoying the act of reading independently. For example, one student responded by stating, "I love reading because I can do it on my own now." Students' responses categorized as less schema included responses where students' rote skills of reading were still developing, so students had not yet shifted into reading independently. Examples of less schema responses included students enjoying "pretend reading" as they looked at the pictures in books. For example, one student said, "I guess I like looking at the pictures in books because I can't read yet." Students who were unable to describe their favorite aspect of reading responded with liking everything about reading or stated that they did not know what they liked about reading. Sub-categories emerged under the primary theme of aesthetic reading. Under the aesthetic category of reading, two sub-categories emerged, including learning and reading. Thus, students specified that they enjoyed learning about new things when reading or specified an enjoyment of the act of reading independently.

The results indicated that more students in the experimental group described their favorite part of reading aesthetically (14 students, 70%), whereas students in the control group did not describe their favorite part of reading aesthetically (0 students, 0%). In the

control group, more students responded that their favorite part of reading involved less schema-related reading tasks (12 students, 44%), whereas in the experimental group, the students did not describe their favorite part of reading as involving less schema-related reading tasks (0 students, 0%). Another noteworthy difference between the groups involved the number of students unable to describe their favorite part of reading between the two groups. More students from the control group were unable to describe their favorite part of reading (15 students, 56%), as compared to the experimental group (6 students, 30%). Therefore, the qualitative results for Q2 supported the idea that students in the experimental group had higher perceptions of reading than students in the control group because the students from the experimental group responded that their favorite part of reading involved the aesthetic components; whereas students from the control group described their favorite part of reading as involving less schema-related reading tasks. Further, more students within the control group had less words to describe reading than students in the experimental group (see Table 8 for a comparison of the control and experimental groups based on the categories that emerged for Q2).

Table 8

Frequency of Themes and Subthemes for Question 2 by Group

	Groups	
Themes and subthemes	Control	Experimental
Aesthetic	0 (0%)	14 (70%)
Learning	0	8
Reading independently	0	6
Less schema	12 (44%)	0 (0%)
Unable to Describe	15 (56%)	6 (30%)

Summary of Chapter 4

Chapter 4 included a report of the quantitative and qualitative results of the research study. Null Hypotheses 1 - 2 were rejected, indicating that the students in the experimental group had higher means on KRDA2, KDIBELS LNF, and KDIBELS NWF-CLS. Null Hypothesis 3 was accepted indicating that the students in the experimental group did not have higher means on Grade1DRA2. Null Hypothesis 4 was accepted for Grade1DIBELS LNF, and Null Hypothesis 4 was rejected for Grade1 DIBELS NWF-CLS. The Sub-Null Hypotheses were accepted, indicating that moderating factors (gender and SLS) did not influence the performance of the students between the two groups. The qualitative data for Q1 supported the idea that students in the experimental group had higher perceptions of reading, as compared to students in the control group because the students used more descriptive and stronger happiness words to describe reading. The qualitative data for Q2 supported the idea that students in the experimental group had higher perceptions of reading because students in the experimental group responded that their favorite part of reading involved aesthetic components, whereas students in the control group described reading as involving less schema-related reading tasks. Chapter 5 includes a conclusion and discussion of the results that were presented in Chapter 4.

Chapter 5

Conclusion and Discussion

> Of course, I want my students to excel academically, but it is also important for my students to enjoy what they are learning. In my classroom, I scrutinize my students' test results to ensure that I know where they are academically in comparison to our goals for the year. Then I develop a strategic plan to make sure that my students reach the target goals. I know that every student can be successful in reaching the target goals, but I also know that every student needs different things in order to be successful. I know that a one-size-fits-all basal reading series does not help every student reach their fullest potential. So I plan differentiated lessons that help the students learn within their zone of proximal development. Since existing curriculum did not account for my students' varied needs, I created a new reading program, Ludus Reading. To my delight, I found that Ludus Reading did help my students' reading scores shoot off the charts and the students were enjoying the process of learning. I find success as a teacher when my students perform well and enjoy the process of learning. It is exciting that my dissertation yielded a new reading program that helped improve my students' reading performance and perceptions.
>
> —Jessica D. Redcay

Chapter 5 is the final chapter of the dissertation, and the chapter includes a conclusion and discussion of the results that were previously reported in Chapter 4. Chapter 5 begins with a discussion and conclusion of the quantitative results organized around the four quantitative research questions and hypotheses. Next, a discussion and

conclusion of the qualitative research results is provided. Subsequently, the limitations of the research study and the educational implications of the study are included. At the end of Chapter 5, recommendations for future studies are provided. The dissertation concludes with a summary of the dissertation results and implications.

Discussion of Quantitative Results

Discussion of H1 results. The null hypothesis for Research Question 1 was rejected, signifying a difference in the PostDRA2 scores between the group receiving Ludus Reading and the group not receiving Ludus Reading. The DRA2 results demonstrated students' overall ability to apply phonics skills to reading (Sticklalnd, 2006). In comparing the two groups, the average score for a student in the experimental group indicated the students were reading at a DRA2 level of nine, whereas the average score for a student in the control group indicated the students were reading at a DRA2 level of five. Both groups scored on average above the school districts reading expectation of a DRA2 level of three or higher. Beaver and Carter (2005) explained that a reader makes a cognitive shift between reading within a range of 3 - 6, DRA2, and a range of 7 - 15, DRA2. Therefore, the students in the control group with an average level of five read texts including predictable language, ranging between 1 - 3 lines per page, and ranging between 53 - 73 words per book (Beaver & Carter). Students in the experimental group with an average level of nine read texts including relatable characters and problems, high number of frequency words, ranging between 2 - 6 lines per page, and ranging between 87 - 207 words per book (Beaver & Carter). Therefore, the experimental group demonstrated higher DRA2 scores, as compared to the control group, but, more importantly, the students in the experimental group were able to apply phonics skills

better, resulting in an increased oral reading fluency level. Further, the students who received Ludus Reading performed within a reading level range that demonstrated a cognitive shift in students' decoding abilities.

Discussion of H2 results. The DIBELS consisted of two sub-constructs, including LNF and NWF-CLS. The DIBELS test was used to demonstrate students sub-skills or reading in comparison to national norms (University of Oregon, 2012). The DIBELS test results can be used to predict students' later reading success based on the established national norms. The DIBELS LNF test measures students' ability to recognize letters automatically (University of Oregon). The null hypothesis for Research Question 2 for DIBELS LNF was accepted, signifying that there was no difference in the students' performance on the KDIBELS LNF between the control and experimental groups. Yet, the performance of both groups was considered above the national norm. The national norm for DIBELS LNF classifies a score higher than 40 as higher than the national norm because students score within the upper 40^{th} percentile of the nation. Therefore, students within the 40^{th} percentile of the nation are considered low risk for later developing reading problems (University of Oregon). The students in the experimental group scored an average mean of 54, and students in the control group scored an average mean of 52. Even though there was no difference noted between the two group in terms of KDIBELS LNF, both groups of students scored within the above average range based on the national norms.

The null hypothesis for Research Question 2 for DIBELS NWF-CLS was rejected. The DIBELS NWF-CLS is a sub-test of reading used to measure students' ability to recognize letter sounds to decode words (University of Oregon, 2012). The

students in the experimental group scored an average (M=53) that was higher than the average (M=32) of the students in the control group. The results indicated that the students in the experimental group were better able to recognize letter sounds and decode words than the students in the control group. Nonetheless, both groups of students scored higher than the national norm on the KDIBELS NWF-CLS. According to University of Oregon (2012), the students with a score above 25 are categorized as above the national norm because the scores are within the 40th percentile of the nation. Therefore, both groups of students scored higher than the national norm, yet the students in the experimental group scored higher than the students in the control group. Thus, the students who received Ludus Reading performed better on the KDIBELS NWF-CLS that did the students who did not receive Ludus Reading, demonstrating students' ability to apply phonics skills and decode words. More importantly, the students in the experimental group scored higher than the national norms on DIBELS LNF and DIBELS NWF-CLS, indicating that the students developed an ability to recognize letters, letter sounds, and apply phonics skills to decode basic words.

Discussion of H3 results. The null hypothesis for Research Question 3 was accepted. Therefore, the students in the experimental group (M=9) did not have statistically significant scores that were higher when compared to the students in the control group (M=6). However, at the end of kindergarten, the students in the experimental group read at DRA2 level nine, and at the beginning of kindergarten, the students retained their reading level because students continued to read, on average, at a DRA2 level of nine. Whereas, the study did not indicate the results were statistically significant the students did retain their reading level from the end of kindergarten into the

beginning of first grade. Subsequently, Ludus Reading was an effective method for teaching phonics because the students' reading performance was improved and maintained into the proceeding school year. The results are consistent with previous research studies demonstrating that effective phonics instruction in kindergarten enhances students' reading performance into the proceeding years of school (Al Otaiba et al., 2011; Strickland & Riley-Ayers, 2004; U.S. Department of Health and Human Services & National Institutes of Health, 2013).

Discussion of H4 results. The null hypothesis for Research Question 4, Grade1DIBELS LNF, was accepted. The results signify that in kindergarten, no difference existed between the control and experimental groups on DIBELS LNF, and at the beginning of the first grade, the results remained the same. However, the students in the experimental group continued to score above the national norm and retained the skills from kindergarten (M=54) to the beginning of Grade 1 (M=53). Additionally, the null hypothesis for Research Question 4 , Grade1 DIBELS NWF-CLS, was rejected. The results signify that in kindergarten, the students in the experimental group scored higher than did the students in the control group when comparing averages on DIBELS NWF-CLS. Subsequently, the students in the experimental group continued to score better than did the students in the control group and national norms. Further, the students in the experimental group retained the skills from kindergarten (M=53) to the beginning of Grade 1 (M=53). The results are consistent with previous research that suggested when reading issues are identified and addressed as early as kindergarten, low reading performance can be modified or prevented (Berk, 2006; Coople & Bredekamp, 2009; Schickedanz, 2004; Simmons et al., 2011).

Discussion of subhypotheses 1–4 results. The null sub-hypotheses for Research Questions 1 - 4 were accepted, signifying that moderating factors of gender and SLS did not influence the scores between the control and experimental groups on KDRA2, KDIBELS LNF, KDIBELS NWF-CLS, Grade1DRA2, Grade1DIBELS LNF, and Grade1DIBELS NWF-CLS. The research results differed from previous research studies that supported the ideas that boys performed better when teachers implement play-based instruction (Lillard et al., 2012; Milteer et al., 2013). The results did not demonstrate an improvement in the boys' performance with the use of play-based instruction. Rather, the results that indicated that Ludus Reading improved the reading performance of all students, regardless of gender. Additionally, previous research studies have shown that students who receive speech language support are more likely to develop early reading delays (Gosse et al., 2013); however, the results of the current research study indicated that SLS did not influence students' reading performance. Therefore, the research study added to existing reading research because the results demonstrated that students demonstrated an improved reading performance, regardless of moderating variables like gender and SLS.

Discussion of Qualitative Results

Discussion of Q1 results. The qualitative data for Q1 supported the idea that students in the experimental group had higher perceptions of reading because students were more descriptive of their feelings about reading, and students used stronger happiness words to describe their feelings of reading, as compared to the control group. McLauren (2012) explained that happiness levels range in intensity, and the highest level of happiness is intense happiness. The students in the experimental group used emotion

words to describe reading like fun and love, which are classified as intense happiness. Students in the control group, however, used emotion words to describe reading as good and okay. The words used by the control group are classified as the lowest level of happiness, which is soft happiness (McLauren). When an emotion of intense happiness is experienced, the person experiencing the emotion will seek to create a similar experience in the future (McLauren). Therefore, since the students in the experimental group reported that they experienced intense levels of happiness with reading, it is assumed that these students will seek to continue to have more reading experiences in the future. If students continue to develop a love for reading, then maybe the positive reading experiences can overcome the fact that half of the American population who can read choose not to read (Farm).

Discussion of Q2 results. The qualitative results for Q2 supported the idea that students in the experimental group had higher perceptions of reading than did the students in the control group because the students in the experimental group responded that their favorite part of reading involved the aesthetic components. Yet, students in the control group described their favorite part of reading as involving less schema-related reading tasks. When students lack basic reading skills, reading is viewed as difficult. As students begin to develop basic schema for reading, their reading perceptions transform (Tracey & Morrow, 2006). Students in the control group reported that their favorite part of reading related to tasks involving less reading schema skills, such as looking at pictures in books. However, students in the experimental group reported that their favorite part related to aesthetic reading. When students read aesthetically, they develop

intrinsic motivation, subsequently resulting in students developing into lifelong readers (Tracey & Morrow).

Previous neuroimaging research studies have demonstrated that good readers tended to show lower activation in their left temporal-parietal and left ocipito-temporal areas, and poor readers showed greater activation in the frontal lobes (Olson & Gayan, 2001). Further, neuroimaging research studies have demonstrated that good readers demonstrate less processing in the phonics area of the brain, demonstrating that phonics skills are automatic and students spend less effort decoding words (Blair, Protzko, & Ursache, 2011). Previous research suggested students struggle with decoding when they are unable to experience the fun and wonder of reading (Sprenger, 2010). Other neuroimaging research studies involving emotions have demonstrated that when students enjoy learning, parts of the brain are activated, like the thalamus, hypothalamus, amygdala, and forebrain (Jensen, 2005). The neuroscience research overlaps. During a positive emotional state, the frontal lobes are activated in the brain (Jensen), whereas when a child is struggling to read, the child is overusing the frontal lobes of the brain (Olson & Gayan, 2001). The qualitative data from the current research study indicated that if students enjoy learning, then they should have a better opportunity to activate parts of the brain necessary to read. At the onset of the research study, brain research was considered in the development of Ludus Reading. After analyzing the research results, it became evident that the brain research further supported Ludus Reading in terms of increasing students' emotional state and perceptions of reading, subsequently improving reading performance.

Educational Implications

The research study furthered the field of education because the study yielded an innovative program, terms, and ideas. Additionally, the research study furthered the existing body of educational research and literature. The researcher focused on the problem of American students being unable to read and not liking to read. The research study yielded a new reading program, in an attempt to increase students' reading performance and perceptions. The researcher coined new terms within the field of reading instruction. Additionally, the research study furthered the literature on teaching kindergarten, reading, play, and technology.

Problem exploration. The research problem was a lack of effective phonics instruction for kindergarten students (Gebeloff et al., 2012; Neuman et al., 2000; Tomlinson & McTighe, 2006) that resulted in kindergarten students not acquiring phonics skills, which are foundational for reading (Al Otaiba et al., 2011; Tyner, 2009). Ludus Reading is a new program, and the results of the research study demonstrated that the program improves kindergarten students' reading performance and perceptions. Therefore, the results of the research study imply that Ludus Reading is one possible solution to the research problem.

Innovative program, ideas, and terms. Doctoral research needs to be grounded in theory and practice (Bennis & O'Toole, 2005). The research study was significant because it was grounded in theory, but it was practically applied to the field of reading instruction. Further, the researcher acted as a thought leader by using innovate ideas and expanding the field of reading instruction (Schnoebelen, 2009). The researcher created a new reading program that diverges from conventional methods (McLaughlin, 2001).

Additionally, the researcher coined seven new terms in the field of literacy: Ludus Reading, Play Technology, E-Print Concepts, Interactive Technology, Play-Based Literacy Centers, Developmentally-Appropriate Technology Integration, and "Interactive-I" in I-VAKT strategies.

Furthering literature about kindergarten. Friedrich Froebel opened the first kindergarten and coined the term "kindergarten," meaning "garden of children" (Passe, 2010). The initial idea of kindergarten emphasized the importance of the learner, however, in a standards-driven era, the focus of kindergarten has shifted to the content (Latval, 2013; Schwartz & Copeland, 2010). Ludus Reading includes the eligible content, but an emphasis is placed on the student because the content is differentiated based on modality, interest, and ability. Previous research has demonstrated that students learn more when the instruction is scaffolded based on individual instructional levels (Boushey & Moser, 2009; Middendorf, 2008; Tomlinson & McTighe, 2006). Furthering Froebel's analogy of kindergarten as a "garden of children," each child (plant) needs different resources or ways to grow. Ludus Reading involves providing each individual student with what they need to grow to their fullest potential. The research study furthers existing literature on how to teach kindergarten students how to read, specifically in the area of phonics instruction, by providing a new program.

Reading instruction. Reading instruction in America is based on CCSS (McLaughlin & Overturf, 2012), so instruction is consistently implemented from one state to the next. Ludus Reading uses 500 differentiated lesson plans, and each lesson plan aligns directly with the CCSS for English Language Arts. Differentiation (DI) ensures that more students reach the state's established goals and standards (Heacox,

2009). Therefore, Ludus Reading differs from existing curriculum because it balances CCSS and DI. Further, Ludus Reading provides classroom teachers with a practical way to implement the CCSS. In the 2014 - 2015 school year, the state assessments will align with the CCSS, and yet, 35 out of 40 states were surveyed and reported that it is a challenge to find adequate resources to use to teach CCSS (Robelen, 2013). The research study examined the effectiveness of Ludus Reading, and the results indicated that the program was effective in increasing students' reading performance and perceptions. Therefore, states, schools, and educational leaders might want to consider adopting a program that increases students' reading performance and perceptions while balancing CCSS and DI.

Play. Research has demonstrated that guided play yields superior retention of learning in the academic achievement of young children (Harris et al., 2011; Jacobs & Crowly, 2007; Latvala, 2013). Therefore, the current body of research on reading instruction and play is furthered by the results of the research study, which indicated that Ludus Reading improves kindergarten students' reading performance and perceptions. The research study involved examining the performance and perceptions of the students because when students are intrinsically motivated to learn, they develop into lifelong learners who enjoy learning (Hirsh-Pasek & Golinkoff, 2003; Lillard et al., 2012). Children feel bored when they receive too much forced instruction (Hirsh-Pasek & Golinkoff; NAEYC, 2012). The familiar, age-old nursery rhyme stated, "All work and no play makes Jack a dull boy, and all play and no work makes Jack a mere toy." The same idea as presented in the nursery rhyme is presented in the balanced approach of Ludus Reading, which involves finding a balance between what students have to learn, but

students are also provided with a new and fun way to learn the content. As presented in Figure 7, Ludus Reading promotes the idea that children feel that the concepts of play and learning are synonymous.

Figure 7. Writing sample depicting a students' perception of Ludus Reading.

Technology. The common saying about technology is that, "the only constant thing is change." The phrase also applies to education, as digital natives (anyone born between 1998 and the present), who have never experienced life without technology (Braiker; Sprenger, 2010), walk into classrooms with teachers who have less knowledge and experience with technology. However, students who have more knowledge about technology have less knowledge about how to interact and socialize. Therefore, Ludus Reading places an emphasis on using cutting-edge technology in the classroom, but in developmentally-appropriate ways. Ludus Reading incorporates interactive technology, which means that students interact or play actively with new technology. Examples of interactive technology used by Ludus Reading include an interactive whiteboard, iPads, and 3-D augmented reality alphabet projection system.

Ludus Reading involves using I-VAKT strategies, and students struggling with language might be able to be successful with reading when using alternative learning domains. The research study added to existing research by yielding results that indicated that Ludus Reading improves the reading performance of students, specifically students who received speech language services. Previous research studies have minimally explored the application possibilities and implications of incorporating interactive whiteboards (Jeans, 2011) and mobile devices (Hutchinson et al., 2012; Schugar et al., 2013) into the classroom. Research has demonstrated that children who use interactive media retain information better than their peers (Braiker, 2013). Still, research studies have not previously linked play literacy and technology (Sawyer & DeZutter, 2009; Smith, 2009). The research study examined the effectiveness of Ludus Reading, which linked play-based literacy instruction and technology. The results suggested that students' reading performance and perceptions increased when the new program was implemented. As depicted in the writing sample in Figure 8, students enjoy playing with technology.

Limitations

The research study used archived data and all information was reported accurately. However, if the research study was conducted again, then the researcher would try to obtain more qualitative information. The students' responses were limited, and sometimes the students used one word to answer the question. If the research study was not a retrospective design, then the researcher could have re- interviewed the students or prompted the students for additional information.

If the research study was conducted again, then the research would use different questions to elicit better responses from students. A retrospective design was appropriate

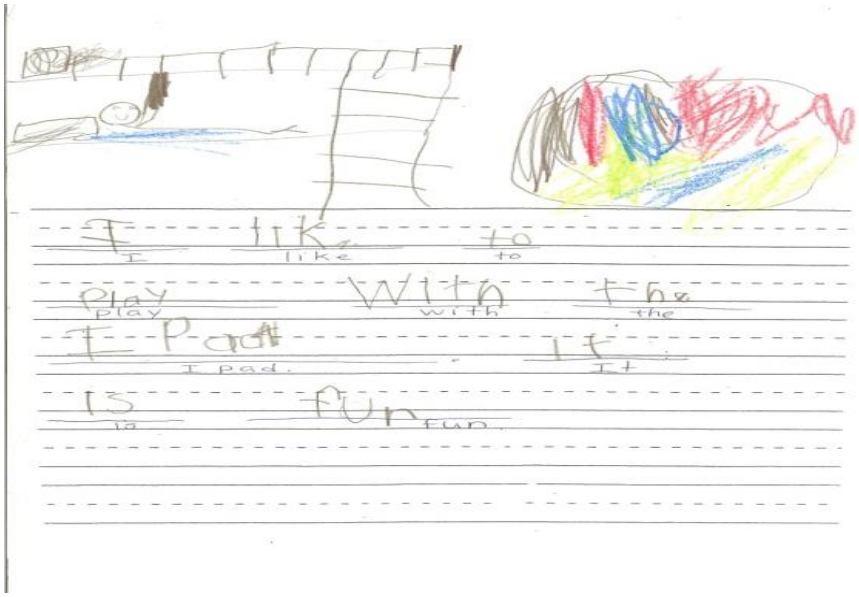


Figure 8. The writing sample depicts a student enjoying the opportunity to use interactive technology.

for the research study because it did not interfere with the students' natural setting. Yet, the design resulted in limitations on gathering more detailed information from the participants (Creswell, 2008).

The researcher analyzed the data using ANCOVA, MANCOVA, and factorial MANCOVA, via SPSS. The data analysis techniques were appropriate for the research study because the study involved analyzing dependent variables and sub-constructs of dependent variables between two independent variables with covariates. Moreover, the results were limited to comparing the means between the two groups. Future studies might examine the results differently to account for the individual growth of each individual student. Some students demonstrated a large amount of growth, but it was not noted because the research study focused on the group as a whole. Even though the data analysis techniques were appropriate for the study, the results were somewhat limited by

the emphasis that was placed on performance of the group as a whole, as opposed to that of the individual students (Sproull, 1995).

Recommendations for Future Studies

The research study was implemented in kindergarten, and only in the area of phonics instruction. Future research studies could evaluate the effectiveness of Ludus Reading in all areas of reading. Additionally, the effectiveness of Ludus Reading could be evaluated in other grade levels and a larger sample size could be obtained. The research study was implemented using half-day kindergarten students as participants, so it would be interesting to test the program using full-day kindergarten students as participants. The effectiveness of the program could be expanded and the students' retention of skills could be tracked beyond the sequential school year. Future studies could evaluate additional moderating variables that were not included in the research study. Further future studies could consider how effective the program would be across different school settings. Future studies could replicate the current research study. Still, future researchers might use different reading assessments to determine the effectiveness of the reading program because if the program is truly effective, then it should improve students' reading performance and perceptions, regardless of the type of assessment. In addition, future studies could survey parents to gather their perceptions of the new reading program, as well as investigate how teachers using he new reading program feel about the program.

Ludus Reading is a program that could be adapted over time. The program could be applied to different content areas or it could become a program that is used to help parents work at home to help their children to learn how to read. The technology

component of Ludus Reading will always need to be expanded and revised to meet the new technological advancements. An example would involve using AppleTV instead of interactive whiteboards, or incorporating QR codes for students to scan to check students' answers/work. Further, new apps become available every second and they need to be reviewed and incorporated accordingly. Moreover, only appropriate and interactive technologies will be used to revise the Ludus Reading program. Whenever adaptations or expansions of Ludus Reading are made in the future, the effectiveness of the new changes need to be evaluated and reviewed.

Additionally, critics might say, "Programs do not teach children, teachers do" (Scanlon, 2013, p. 21). Even though the previous statement is true, teachers need to be provided with research-based, quality resources. Teachers must have ways to differentiate the CCSS to ensure the success of every student. Further, teachers must have teaching materials that are fun, and that students enjoy using. To ensure the new program is implemented in other settings with fidelity, professional development opportunities will need to be made available. Levin (2008) explained that research has demonstrated that professional development opportunities are necessary to ensure that curriculum is implemented fully.

Summary of Chapter 5

The researcher provided a comprehensive description of the current research study in Chapters 1 - 5. Specifically, Chapter 5 included the conclusions and discussions of the research study. The purpose of the mixed-method research study was to explore the differences of kindergarten students' reading performance and perceptions between the experimental group, students who received Ludus Reading, and control group, students

who did not receive Ludus Reading. The mixed-method research study results indicated that Ludus Reading improved the performance and perceptions of kindergarten students involved in the research study. The results of the study indicate that Ludus Reading provides an effective new way to teach reading, specifically in the area of phonics instruction. The new program diverges from previous reading programs because it balances the CCSS and DI. Further, Ludus Reading combines reading, play, and technology. The research study is significant because it yielded a new reading program and new terms in the areas of reading, play, and technology. The results indicated that the new reading program was effective, in terms of increasing students' reading performance and perceptions. The study yielded a program that helps students to learn to read, but still ensures that the students are having fun learning. Further educational leaders might consider adopting a new program that improves the perceptions and performance of students. In the future, Ludus Reading could be expanded and further tested in different settings.

References

Adams, M. J. (2003). Alphabetic anxiety and explicit systematic phonics instruction: A cognitive science perspective. In S. B. Neuman & D. K. Dickinson (Eds.), *Handbook of early literacy research* (pp. 66–80). New York, NY: Guilford Press.

Adamson, C. J. (2013, April 25). Whole language approach versus phonics. Retrieved from https://www.yesphonics.com/whole-language-approach-vs-phonics/

Al Otaiba, S., Connor, C. M., Folsom, J. S., Greulich, L., Meadows, J., & Li, Z. (2011). Assessment data-informed guidance to individualize kindergarten reading instruction: Findings from a cluster-randomized control field trial. *The Elementary School Journal*, *111*(4), 535–560. doi:0013-5984/2011/11104-0003

Armbruster, B. B., Lehr, F., & Osborn, J. (2001). *Put reading first: The research building blocks for teaching children to read kindergarten through grade 3* (pp. 11–17). Washington, DC: National Institute for Literacy.

Armstrong, T. (2006). *The best schools: How human development research should inform educational practice.* Alexandria, VA: Association for Supervision and Curriculum Development.

Barblett, L. (2010). Why play-based learning. *Every Child*, *16*(3), 4–5. Retrieved from http://www.earlychildhoodaustralia.org.au

Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report*, *13*(4). Retrieved from http://www.nova.edu

Bear, D. R., Invernizzi, M., Templeton, S., & Johnston, F. (2008). *Words their way: Word study for phonics, vocabulary, and spelling instruction.* Upper Saddle River, NJ: Pearson.

Beaver, J., & Carter, M. (2005). *Developmental reading assessment* (2nd ed.). Upper Saddle River, NJ: Pearson.

Beck, I. L. (2003). *Harcourt trophies kindergarten: Teacher's edition.* Orlando, FL: Harcourt Brace.

Bender, W. N., & Shores, C. (2007). *Response to intervention: A practical guide for every teacher*. Thousand Oaks, CA: Corwin Press.

Bennett, J. C., & Harris, J. (2011) Analyzing gender differences in Black faculty marginalization through a sequential mixed method design. In K. A. Griffin & S. D. Musseus (2011). *Using mixed-methods approaches to study intersectionality in higher education.* Hoboken, NJ: Wiley.

Bennis, W. G., & O'Toole, J. (2005, May). How business schools lost their way. *Harvard Business Review*, *83*(5). Retrieved from http://hbr.org/

Berk, L. E. (2006). Looking at kindergarten children. In D. F. Gullo (Ed.), *Kindergarten today: Teaching and learning in the kindergarten year*. Washington, DC: National Association for the Education of Young Children.

Blagojevic, B., Brumer, S. C., O'Clair, A., & Thomes, K. (2012). Touch and grow: Learning to explore using tablets. *Teaching Young Children*, *6*(1), 18–22.

Blair, C., Protzko, J., & Ursache, A. (2011). Self-regulation and early literacy. In S. B. Neuman & D. K. (Eds.), *Handbook of early literacy research* (pp. 20–35). New York, NY: Guilford Press.

Blevins, W. (1998). *Phonics from A to Z: A practical guide*. New York, NY: Scholastic.

Boushey, G., & Moser, J. (2009). *The cafe book: Engaging all students in daily literacy assessment and instruction*. Portland, MN: Stenhouse.

Braiker, B. (2013, February). Swipeout. *Parenting*, *271*, 66–69. Retrieved from http://www.parents.com

Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation design and analysis issues for field settings*. Hopewell, NJ: Houghton Mifflin.

Cooper, J. D., Robinson, M. D., & Kiger, N. D. (2010). *Success with RTI: Research-based strategies for managing RTI and core reading instruction in your classroom*. New York, NY: Scholastic.

Coople, C., & Bredekamp, S. (2009). *Developmentally appropriate practice in early childhood programs serving children from birth through age 8* (3rd ed.). Washington, DC: National Association for the Education for Young Children.

Council of Chief State School Officers, & National Governs Association Center for Best Practice. (2010). *Common core state standards: An introduction*. Retrieved from Core Standards website: http://www.corestandards.org/assets/ccssi-introduction .pdf

Creswell, J. W. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (3rd ed.). Upper Saddle River, NJ: Pearson.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: Sage.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Washington, DC: Sage.

Cunningham, P. M., & Cunningham, J. W. (2002). What we know about how to teach phonics. In A. E. Farstrup, & S. Samuels (Eds.), *What research has to say about reading instruction* (pp. 87–109). Newark, DE: International Reading Association.

Dalton, B. (2012). Multimodal composition and the common core state standards. *The Reading Teacher*, *66*(4), 333–339. doi:1002/TRTR.01129

Duke, N. K., & Martin, N. M. (2011). Ten things every literacy educator should know about research. *The Reading Teacher*, *65*(1), 9–22. doi:10.1598/rt.65.1.2

Dunn, L., & Beach, S. A. (2009). Supporting literacy and play in early childhood programs: Promising practices and continuing challenges. In K. A. Roskos & J. F. Christie (Eds.), *Play and literacy in early childhood: Research from multiple perspectives* (pp. 101–118). Mahwah, NJ: Routledge.

Education Commission of the States. (2012). *Access to kindergarten: Age issues in state statues*. Retrieved from http://mb2.ecs.org/reports/Report.aspx?id=32

Espinosa, L. (2010). *Getting it right for young children from diverse backgrounds: Applying research to improve practice.* Washington, DC: Pearson.

Farm, A. (2007). One in four read no books last year. *The Washington Post.* Retrieved from www.washingtonpost.com

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149–1160. doi:10.3758/BRM.41.4.1149

Feldgus, E. G., & Cardonick, I. (1999). *Kid writing: A systematic approach to phonics, journals, and writing workshop.* New York, NY: Wright Group.

Flesch, R. (1955). *Why Johnny can't read* [E-book]. New York, NY: HarperCollins.

Flora, S. B. (2011). *Early literacy intervention activities: Research-based instructional strategies that promote the development of reading, writing, and spelling skills necessary for later literacy achievement.* Minneapolis, MN: Key Education.

Fountas, I. C., & Pinnell, G. S. (1996). *Guided reading: Good first teaching for all children.* Portsmouth, NH: Heinemann.

Fox, B. J. (2005). *Phonics for the teacher of reading* (9th ed.). Upper Saddle River, NJ: Pearson Education.

Gebeloff, R., Evans, T., & Scheinkman, A. (2012). Diversity in the classroom. *New York Times*. Retrieved from http://projects.nytimes.com/immigration/enrollment

Golbeck, S. L. (2006). Developing key cognitive skills. In D. F. Gullo (Ed.), *Kindergarten today: Teaching and learning in the kindergarten years*. Washington, DC: National Association for the Education of Young Children.

Good, R. H., Kaminski, R. A., Shinn, M., Bratten, J., Shinn, M., Laimon, D., Smith, S., & Flindt, N. (2004). *Technical adequacy of DIBELS: Results of the early childhood research institute on measuring growth and development* (Technical Report No. 7). Retrieved from https://dibels.uoregon.edu

Good, R. H., Simmons, D., Kame'enui, E., Kaminski, R. A., & Wallin, J. (2002). *Summary of the decision rules for intensive, strategic, and benchmark instructional recommendations in kindergarten through third grade* (Technical Report No. 11). Retrieved from https://dibels.uoregon.edu

Goodman, K. S., (2006). *The truth about DIBELS.* Portsmouth, NH: Heinemann.

Gosse, C. S., Hoffman, L. M., & Invernizzi, M. A. (2012). Overlap in speech-language and reading services for kindergarteners and first graders. *Language, Speech, Hearing Services in Schools*, *43*(1). doi:10.1044/0161-1461(2011/09-0080)

Goswami, U. (2003). Early phonological development and the acquisition of literacy. In S. B. Neuman & D. K. Dickinson (Eds.), *Handbook of early literacy research* (pp. 111–125). New York, NY: Guilford Press.

Graue, M. E. (2006). This think called kindergarten. In D. F. Gullo (Ed.), *Kindergarten today: Teaching and learning in the kindergarten year*. Washington, DC: National Association for the Education of Young Children.

Griffin, K. A., & Musseus, S. D. (2011). Application of mixed-methods approaches to higher education and intersectional analyses. In K. A. Griffin & S. D. Musseus (Eds.), *Using mixed-methods approaches to study intersectionality in higher education.* Hoboken, NJ: Wiley.

Han, M. (2009). Individual differences in play style and literacy: A bio-ecological perspective. In K. A. Roskos & J. F. Christie (Eds.), *Play and literacy in early childhood: Research from multiple perspectives* (pp. 119–132). Mahwah, NJ: Routledge.

Hansen, S. E., Iverson, J., Jensen, U., Orten, H., & Vompras, J. (2011). *Enabling longitudinal data comparison using DDI* (pp. 1–22). doi:http://dx.doi.org/10.3886/DDIlongitudinal102

Harper, C. E. (2011). Identity, intersectionality, and mixed methods approaches In K. A. Griffin & S. D. Musseus (Eds.), *Using mixed-methods approaches to study intersectionality in higher education.* Hoboken, NJ: Wiley.

Harris, J., Golinkoff, R. M., & Hirsh-Pasek, K. (2011). Lessons from the crib for the classroom: How children really learn vocabulary. In S. B. Neuman & D. K. Dickinson (Eds.), *Handbook of early literacy research* (pp. 49–65). New York, NY: Guilford Press.

Heacox, D. H. (2009). *Making differentiation a habit: How to ensure success in academically diverse classrooms.* Minneapolis, MN: Free Spirit.

Hempenstall, K. (2013). Some issues in phonics instruction: Implicit and explicit phonics instruction. *Education News.* Retrieved from http://literacy.kent.edu/Oasis/Pubs /0200-15.htm

Heroman, C., & Copple, C. (2006). Teaching in the kindergarten year. In D. F. Gullo (Ed.), *Kindergarten today: Teaching and learning in the kindergarten year* (pp. 59–72). Washington, DC: National Association for the Education of Young Children.

Hiebert, E. H., & Martin, L. A. (2003). The texts of beginning reading instruction. In S. B. Neuman & D. K. Dickinson (Eds.), *Handbook of early literacy research* (pp. 361–376). New York, NY: Guilford Press.

Hirsh-Pasek, K., & Golinkoff, R. M. (2003). *Einstein never used flash cards.* New York, NY: Rodale.

Howard, P. (2005, May). Dynamic indicators of basic early literacy skills. *Florida Center for Reading Research.* Retrieved from https://dibels.uoregon.edu

Huizinga, J. (1950). *Homo ludens: A study of the play element in culture.* Boston, MA: Beacon Press.

Hutchinson, A., Beschorner, B., & Schmidt-Crawford, D. (2012). Exploring the use of the iPad for literacy learning. *The Reading Teacher*, *66*(1), 15–23. doi:10.1002/TRTR.01090

International Reading Association. (2009). *New literacies and 21st-century technologies: A position statement for the International Reading Association.* Newark, DE: Author.

Jacobs, G., & Crowley, K. (2007). *Play, projects, and preschool standards: Nurturing children's sense of wonder and joy in learning.* Thousand Oaks, CA: Corwin Press.

Jeans, M. (2011). *Creating smart board lessons: Yes, you can!* New York, NY: Scholastic.

Jensen, E. (2005). *Teaching with the brain in mind* (2nd ed.). Alexandria, VA: Association for Supervision and Curriculum Development.

Jones, E. (2012, March). The emergence of emergent curriculum. *Young Children*, *67*(2), 66–68.

Kaminski, R., & Cummings, K. D. (2007). DIBELS: Myths and facts. *Dynamic Measurement Group* (pp. 1–16). Retrieved from https://dibels.uoregon.edu

Koralek, D. (2002). *Spotlight on young children and language*. Washington, DC: National Association for the Education of Young Children.

Kostelnik, M. J., & Grady, M. L. (2009). *Getting it right from the start: The principal's guide to early childhood education*. Thousand Oaks, CA: Corwin.

Kozol, J. (1985). *Illiterate America.* Washington, DC: Library of Congress.

Kress, G. (2003). *Literacy in the new media age.* New York, NY: Routledge.

Larson, J., & Marsh, J. (2009). *Making literacy real: Theory and practices for learning and teaching.* Thousand Oaks, CA: Sage.

Latvala, C. (2013). Kicked-up kindergarten. *Parenting*, *270*, 100–103.

Levin, B. (2008). Curriculum policy and the politics of what should be learned in schools. In F.M. Connelly (Ed.), *The sage handbook of curriculum and instruction.* Los Angeles, CA: Sage.

Lillard, A. S., Lerner, M. D., Hopkins, E. J., Dore, R. A., Smith, E. D., & Palmquist, C. M (2012). The impact of pretend play on children's development: A review of the evidence. *Psychological Bulletin* (pp. 18–34). doi:10.1037/a0029321

Logical Choice Technologies. (2013). Letters alive. Retrieved from http://www.logicalchoice.com/archive/archive/augmented-reality-for-teaching-learning/letters-alive-curriculum-pre-k-k/

Lunenburg, F. C. (2010). Managing change: The role of the change agent. *International Journal of Management, Business, and Administration*, *13*(1). Retrieved from http://www.nationalforum.com

McGill-Franzen, A. (2006). *Kindergarten literacy: Matching assessment and instruction in kindergarten.* New York, NY: Scholastic.

McLaren, K. (2012). Emotional vocabulary list. Retrieved from http://karlamclaren.com/

McLaughlin, C. (2001). The center for visionary leadership. Retrieved from http://www.visionaryleader.org

McLaughlin, M., & Overturf, B. J. (2012). The common core: Insights into the K–5 standards. *Reading Teacher*, *66*(2), 153–164. doi:10.1002/TRTR.01115

McMillan, J. H., Schumacher, S., Aron, A., Aron, E. N., Mills, G. E., Martella, R. C., Nelson, R., Marchand-Martella, N. E., & Creswell, J. W. (2002). *Action research.* Upper Saddle Revier, NJ: Prentice-Hall.

Middendorf, C. (2008). *Differentiating instruction in kindergarten: Planning tips, assessment tools, management-leveled centers, and activities that reach and nurture every learner*. New York, NY: Scholastic.

Miller, D. (2009). *The book whisperer: Awakening the inner reader in every child.* San Francisco, CA: Josey-Bass.

Milteer, R. M., Ginsburg, K. R., Council on Communication and Media, & Committee on Psychosocial Aspects of Child and Family Health. (2013). The importance of play in promoting healthy child development and maintaining strong parent-child bond: Focus on children in poverty. *American Academy of Pediatrics*, *129*(1), 204–213. doi:10.1542/peds.2011-2953

Morrell, E. (2012). 21st-century literacies, critical media pedagogies, and language arts. *Reading Teacher*, *66*(4), 300–302. doi:10.1002/TRTR.01125

Morrow, L. M. (2004). Developmentally appropriate practice in early literacy instruction. *The Reading Teacher*, *58*(1), 86–100. doi:10.1598/rt.58.1.9

Musseus, S. D. (2011). An introductory mixed-methods intersectionality analysis of college access and equity: An examination of first-generation Asian American and Pacific Islanders. In K. A. Griffin & S. D. Musseus (Eds.), *Using mixed-methods approaches to study intersectionality in higher education.* Hoboken, NJ: Wiley.

Nast, P. (2013). All students can benefit from learning and using sign language. *NEA Today*, *31*(4), 19.

National Association for the Education of Young Children. (2012, November). Position Statements [website]. *Retrieved from* http://www.naeyc.org/positionstatements

National Association for the Education of Young Children & Fred Rogers Center for Early Learning and Children's Media. (2012). Selected examples of effective classroom practice involving technology tools and interactive media. Retrieved from www.naeyc.org

National Center for Education Statistics. (2013). The kindergarten year. Retrieved from http://nces.edu/gov

National Early Literacy Panel. (2009). *Developing early literacy: Report of the national early literacy panel*. Retrieved from Literacy Information and Communication System website: http://lincs.ed.gov/publications/pdf/NELPReport09.pdf

National Reading Panel Report (2001). *Put reading first: The research building blocks for teaching children to read*. Baltimore, MD: National Institute for Literacy.

Nell, M., & Drew, W. F. (2013). Five essentials to meaningful play. *NAEYC for Families.* Retrieved from http://families.naeyc.org

Neuman, S. B. (2004, September). The effect of print-rich classroom environments on early literacy growth. *The Reading Teacher*, *58*(1), 89–95.

Neuman, S. B., Copple, C., & Bredekamp, S. (2000). *Learning to read and write: Developmentally appropriate practices for young children*. Washington, DC: National Association for the Education of Young Children.

Oliver, S. J., & Klugman, E. (2004). Speaking out for play-based learning: Becoming an effective advocate of play in the early childhood classroom. *Child Care Information Exchange*, 22–25. Retrieved from www.childcareexchange.com

Olsen, W. K. (2004). Moderating variables. *The sage encyclopedia of social science research methods.* doi:10.4135/9781412950589

Olson, R. K., & Gayan, J. (2001). Brains, genes, and environment in reading development. In S. Neumann & D. Dickinson. (Eds.), *Handbook of early literacy research* (pp. 81-94). New York, NY: Guilford Press.

Olufowobi, O. O., & Makinde, S. O. (2010). Aliteracy: A threat to educational development. *Educational Research.* Retrieved from www.interesjournals.org

Passe, A. S. (2010). *Is everybody ready for kindergarten: A tool kit for preparing children and families*. MN: Redleaf Press.

Pearson Education. (2011). *DRA2 K–8* [Technical manual]. Retrieved from http://www.pearsonschool.com

Pennsylvania Department of Education. (2013). Pennsylvania math and reading results. Retrieved from www.pde.edu

ProLiteracy. (2013). U.S. reading crisis. Retrieved from www.prolitercy.org

Puerling, B. (2012). *Teaching in the digital age: Smart tools for age 3 to Grade 3.* MN: Redleaf Press.

Requtzel, D. R., Hollingsworth, P. M., & Cox, S. A. (2013). Research to practice: Issues in reading instruction based-on U.S. state legislators' perceptions and knowledge. Retrieved from http://literacy.kent.edu/Oasis/Pubs/0200-15.htm

Reutzel, D. R., & Clark, S. (2011). Organizing literacy classrooms for effective instruction: Survival guide. *The Reading Teacher*, *65*(2), 96–109. doi:10.1002/TRTR.01013

Reyhner, J. (2013). The reading wars. Retrieved from http://jan.ucc.nau.edu/~jar/Reading_Wars.html

Richardson, J. (2009). *The next step in guided reading: Focused assessment and targeted lessons for helping every student become a better reader*. New York, NY: Scholastic.

Robelen, E. (2013). Report: States make headway in aligning curriculum to common core. *Education Week.* Retrieved from http://blogs.edweek.org

Rog, L. J. (2011). *Read, write, play*, *learn: Literacy instruction in today's kindergarten.* Newark, DE: International Reading Association.

Roopnarine, J., & Johnson, J. E. (2009). *Approaches to early childhood education* (5th ed.). Upper Saddle River, NJ: Pearson.

Roskos, K. A., & Christie, J. F. (2009). *Play and literacy in early childhood: Research from multiple perspectives* (2nd ed.). Mahwah, NJ: Routledge.

Routman, R. (2003). *Reading essentials: The specifics you need to teach reading well.* Portsmouth, NH: Heinemann.

Rovai, A. P., Baker, J. D., & Ponton, M. K. (2013). *Social science research design and statistics: A practitioner's guide to research methods and SPSS analysis* (1st ed.). Chesapeake, VA: SPSS.

Rowe, D. W. (2009). Bringing books to life: The role of book-related dramatic play in young children's literacy learning. In K. A. Roskos & J. F. Christie (Eds.), *Play and literacy in early childhood: Research from multiple perspectives* (pp. 37–63). Mahwah, NJ: Routledge.

Salkind, N. J. (2003). *Exploring research* (5th ed.). Upper Saddle River, NJ: Prentice-Hall.

Santrock, J. W. (2008*). Life-span development* (11th ed.). Boston, MA: McGraw-Hill.

Sawyer, R. K., & DeZutter, S. (2009). Improvisation: A lens for play and literacy research. In K. A. Roskos & J. F. Christie (Eds.), *Play and literacy in early childhood: Research from multiple perspectives* (pp. 21–36). Mahwah, NJ: Routledge.

Scanlon, D. M. (2013). The trouble with packaged and scripted interventions. *Reading Today*, *31*(1), 20–21. Retrieved from www.reading.org/readingtoday

Scarborough, H. S. (2003). Connecting early language and literacy to later reading disabilities: Evidence, theory, and practice. In S. B. Neuman & D. K. Dickinson (Eds.), *Handbook of early literacy research* (pp. 97–110). New York, NY: Guilford Press.

Schickendanz, J. A. (2004). A framework and suggested guidelines for prekindergarten content standards. *The Reading Teacher*, *58*(1), 86–100.

Schiefel, U., Schaffner, E., Moller, J., & Wigfield, A. (2012). Dimensions of reading motivation and their relation to reading behavior and competence. *Reading Research Quarterly*, *47*(4), 427–463. doi:10.1002/RRQ.030

Schnoebelen, T. (2009). An exploration of thought leaders. Retrieved from http://www.standford.edu

Schugar, H. R., Smith, C. A., & Schugar, J. T. (2013). Teaching with interactive picture e-books in grades K–6. *The Reading Teaching*, *66*(8), 615–624. doi:10.1002/trtr.1168

Schwartz, S. L., & Copeland, S. M. (2010). *Connecting emergent curriculum and standards in the early childhood classroom: Strengthening content and teaching practice*. New York, NY: Teaching College Press.

Serafini, F., & Youngs, S. (2013). Reading workshop 2.0. *The Reading Teacher*, *66*(5), 401–404.

Simmons, D., Coyne, M. D., Hagain-Burke, S., Kwok, D., Simmons, L., Johnson, C.,...Crevecoeur, Y. C. (2011). Effects of supplemental reading interventions in authentic contexts: A comparison of kindergarten response. *Exceptional Children*, *77*(2), 207–228. doi:10.1177/00222194070400040401

Simon, F., & Nemeth, K. (2012). *Digital decisions: Choosing the right technology tools for early childhood education.* Lewisville, NC: Gryphon House.

Smith, G. E., & Throne, S. (2007). *Differentiating instruction with technology in K–5 classrooms.* Washington, DC: International Society for Technology in Education.

Smith, P. K., (2009). Pretend play and children's cognitive and literacy development: Sources of evidence and some lessons from the past. In K. A. Roskos & J. F. Christie (Eds.), *Play and literacy in early childhood: Research from multiple perspectives* (pp. 3–19). Mahwah, NJ: Routledge.

Snow, K. (2012, November). Variation in children's experience of kindergarten and the common core. *Young Children Journal*, 67, 1–14. Retrieved from www.naeyc.org

Southall, M. (2007). *Differentiate Literacy Centers.* New York, NY: Scholastic.

Sprenger, M. (2010). *Brain-based teaching in the digital age.* Alexandria, VA: Association for Supervision and Curriculum Development.

Sprenger, M. (2013). *Wiring the brain for reading: Brain-based strategies for teaching literacy.* San Francisco, CA: John Wiley & Sons.

Sproull, N. L. (1995). *Handbook of research methods: A guide for practitioners and students in the social sciences* (2nd ed.). Metuchen, NJ: Scarecrow Press.

Stahl, S. A. (2003). Teaching phonics and phonological awareness. In S. B. Neuman & D. K. Dickinson (Eds.), *Handbook of early literacy research* (pp. 333–347). New York, NY: Guilford Press.

Stinnett, M. (2011). Research in reading. *Illinois Reading Council Journal*, *39*(3). Retrieved from http://www.illinoisreadingcouncil.org

Strickland, D. S. (2004). Working with families as partners in early literacy. In D. S. Strickland. The role of literacy in early childhood education. *The Reading Teacher*, *58*(1), 86–100. doi:10.1598/rt.58.1.9

Strickland, D. S. (2006). Language and literacy in kindergarten. In D. F. Gullo (Ed.), *Kindergarten today: Teaching and learning in the kindergarten year* (pp. 73–84). Washington, DC: National Association for the Education of Young Children.

Strickland, D. S., & Riley-Ayers, S. (2013). Early literacy: Policy and practice in the preschool years. Retrieved from www.readingrockets.org

Szymusiak, K., Sibberson, F., & Koch, L. (2008). *Beyond leveled books: Supporting early and transitional reading grades K–5* (2nd ed.). Portland, MN: Stenhouse.

Tabachnick, B., C., & Fidell, L., S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Pearson.

Tice, C. (2008). Learning profiles. Retrieved from http://iss.gstboces.org/ctice/trainings /di/strategies/LrngProfiles.htm

Tomlinson, C. A., & McTighe, J. (2006). *Integrating differentiated instruction: Understanding by design*. Alexandria, VA: Association for Supervision and Curriculum Development.

Tompkins, G. E. (2005). *Language Arts: Patterns of practice* (6th ed.). Upper Saddle River, NJ: Pearson.

Toppo, G. (2008). Study: Bush's reading first program ineffective. Retrieved from http://usatoday.com

Tracey, D. H., & Morrow, L. M. (2006). *Lenses on reading: An introduction to theories and models*. New York, NY: Guilford Press.

Trochim, M. L. K. (2006). Quasi-experimental design. Retrieved from http://www.socialresearchmethods.net/kb/quasiexp.php

Tyner, B. (2009). *Small-group reading instruction: A differentiated teaching model for beginning and struggling readers* (2nd ed.). Newark, DE: International Reading Association.

University of Oregon. (2012). DIBELS: Data system. Retrieved from https://dibels.uoregon.edu/

University of Phoenix. (2013). *Mission and purpose.* Retrieved from http://www.phoenix.edu/about_us/about_university_of_phoenix/mission_and_purpose.html

U.S. Department of Health and Human Services and National Institutes of Health. (2013). *Report on the national reading panel.* Retrieved from http://www.nichd.nih.gov

U.S. Department of Education, Institute of Education Science, National Center for Education Statistics, & National Assessment of Educational Progress. (2011). *Reading literacy in the United States: Executive summary* (pp. 1–25). Retrieved from http://www.nces.ed.gov

Vacca, R. T., & Vacca, J. A. (2008). *Content area reading: Literacy and learning across the curriculum* (9th ed.). New York, NY: Pearson.

Vukelich, C. (2004). In search of highly qualified early childhood classroom literacy teachers. *The Reading Teacher*, *58*(1), 97–99.

Walcavich, M., & Bauer, K. (2007). *Literacy play centers: Play is the way young children learn.* Greensboro, NC: Carson-Dellosa.

Walker, R. W. (2013). Ready . . . set . . . read: Help your students become lifelong readers. *NEA Today*, *31*(4), 26–27.

Watts-Taffe, S., Laster, B. P., Broach, L. Marinak, B, Connor, C., & Walker-Dalhouse, D. (2012). Differentiated instruction: Making informed teacher decisions. *The Reading Teacher*, *66*(4), 303–314. doi:10.1002/TRTR.01126

Weaver, B. M. (2009). *RTI: Assessment and remediation for K–2*. New York, NY: Scholastic.

Whitehurst, G. J., & Lonigan, C. J. (2003). Emergent literacy: Development from pre-readers to readers. In S. B. Neuman & D. K. Dickinson (Eds.), *Handbook of early literacy research* (pp. 11–29). New York, NY: Guilford Press.

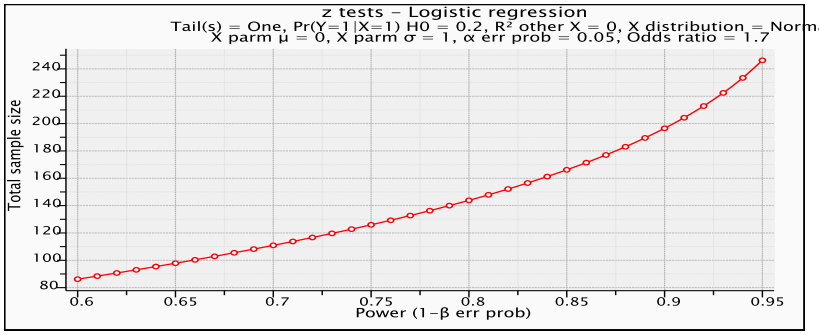
Wiles, J., Bondi, J., & Sowell, J. (2002). *Foundations of curriculum and instruction.* Prentice-Hall.

Williams, D. (2007). Content then process: Teacher learning communities in the service of formative assessment. In D. Reeves (Ed.), *Ahead of the curve: The power of assessment to transform teaching and learning*. Bloomington, IN: Solution Tree Press.

Zigler, E. F., & Bishop-Josef, S. J. (2004). Play under siege: A historical overview. In E. F. Zigler, D. G. Singer, & S. J. Bishop-Josef (Eds.), *Children's play: The roots of reading* (pp. 1–13). Washington, DC: Zero to Three Press.

Appendix A

Screenshot of G*Power 3.0.10 Test



Wednesday, June 05, 2013 -- 17:12:47
z tests - Logistic regression

Options:	Large sample z-Test, Demidenko (2007) with var corr		
Analysis:	A priori: Compute required sample size		
Input:	Tail(s)	=	One
Odds ratio	=	1.7	
Pr(Y=1|X=1) H0	=	0.2	
α err prob	=	0.05	
Power (1-β err prob)		0.80	
R^2 other X	=	0	
X distribution	=	Normal	
X parm μ	=	0	
X parm σ	=	1	
Output:	Critical z	=	1.64
Total sample size		144	
Actual power	=	0.80	

Figure A1. Screenshot of G*Power 3.0.10 Test depicting the minimal sample size needed.

Appendix B

Descriptive Statistics of the Dependent and Covariate Variables

Table B1

Descriptive Statistics of the Dependent and Covariate Variables used in Research Questions 1-4

Dependent variable	*M*	*SD*	Skewness	Kurtosis	Min	Max
Pre KDRA2	3.16	2.49	1.94	3.89	1	12
Post KDRA2	6.90	5.06	0.83	-0.82	1	16
Pre KDIBELS LNF	27.71	15.87	-0.04	-0.90	0	57
Post KDIBELS LNF	52.56	15.33	0.13	-1.03	27	83
Pre KDIBELS NWF CLS	23.15	11.22	0.316	0.03	0	58
Post KDIBELS NWF CLS	41.45	22.63	1.00	0.43	7	102
Grade 1 DRA2	7.44	5.39	0.69	-1.11	1	18
Grade 1 DIBELS LNF	53.30	12.59	0.22	-0.09	25	88
Grade 1 DIBELS NWF CLS	42.55	24.92	1.40	1.87	3	118

Note. $n = 73$

Appendix C

Data Screening Tables

Table C1

Skewness and Kurtosis Statistics of Dependent and Covariate Variables used in Research Questions 1–4

Dependent variable	Skewness	Z-skew	Kurtosis	Z-kurtosis
Pre KDRA2	1.94	6.93	3.89	7.01
Post KDRA2	0.83	2.98	-0.82	-1.49
Pre KDIBELS LNF	-0.04	-0.16	-0.90	-1.63
Post KDIBELS LNF	0.13	0.46	-1.03	-1.86
Pre KDIBELS NWF CLS	0.31	1.12	0.03	0.06
Post KDIBELS NWF CLS	1.00	3.58	0.43	0.78
Grade 1 DRA2	0.69	2.45	-1.11	-2.01
Grade 1 DIBELS LNF	0.22	0.81	-0.09	-0.17
Grade 1 DIBELS NWF CLS	1.40	4.99	1.87	3.38

Note. Skew $SE = 0.28$, Kurtosis $SE = 0.55$, $n = 73$

Table C2

Levene's Test of Equality of Error Variances of Dependent Variables used in Research Questions 1–4

Research question	Dependent variable	*F*	*df1*	*df2*	Sig.
1	Post DRA2	10.13	1	71	.002
1a	Post DRA2	2.07	3	69	.11
1b	Post DRA2	5.00	3	69	.003
2	Post KDIBELS LNF	0.66	1	71	.41
	Post KDIBELS NWF-CLS	0.20	1	71	.65
2a	Post KDIBELS LNF	0.59	3	69	.62
	Post KDIBELS NWF-CLS	0.22	3	69	.87
2b	Post KDIBELS LNF	0.83	3	69	.48
	Post KDIBELS NWF-CLS	0.38	3	69	.76
3	Grade 1 DRA2	2.83	1	71	.09
3a	Grade 1 DRA2	1.09	3	69	.35
3b	Grade 1 DRA2	1.6	3	69	.19
4	Grade 1 DIBELS LNF	4.48	1	71	.03
	Grade 1 DIBELS NWF-CLS	0.08	1	71	.76
4a	Grade 1 DIBELS LNF	1.72	3	69	.16
	Grade 1 DIBELS NWF-CLS	1.18	3	69	.32
4b	Grade 1 DIBELS LNF	1.96	3	69	.12
	Grade 1 DIBELS NWF-CLS	0.74	3	69	.53

Table C3

Summary of Box's M Test of Equality of Covariance Matrices for Research Questions 2 and 4

Research question	Box's *M*	*F*	*df1*	*df2*	Sig.
2	2.58	0.83	3	848,766.22	.47
2a	10.75	1.13	9	30,023.01	.33
2b	10.20	0.99	9	805.71	.44
4	3.64	1.17	3	848,766.22	.31
4a	18.03	1.89	9	30,023.01	.04
4b	7.24	0.70	9	805.71	.70

Appendix D

Results of Hypothesis 1

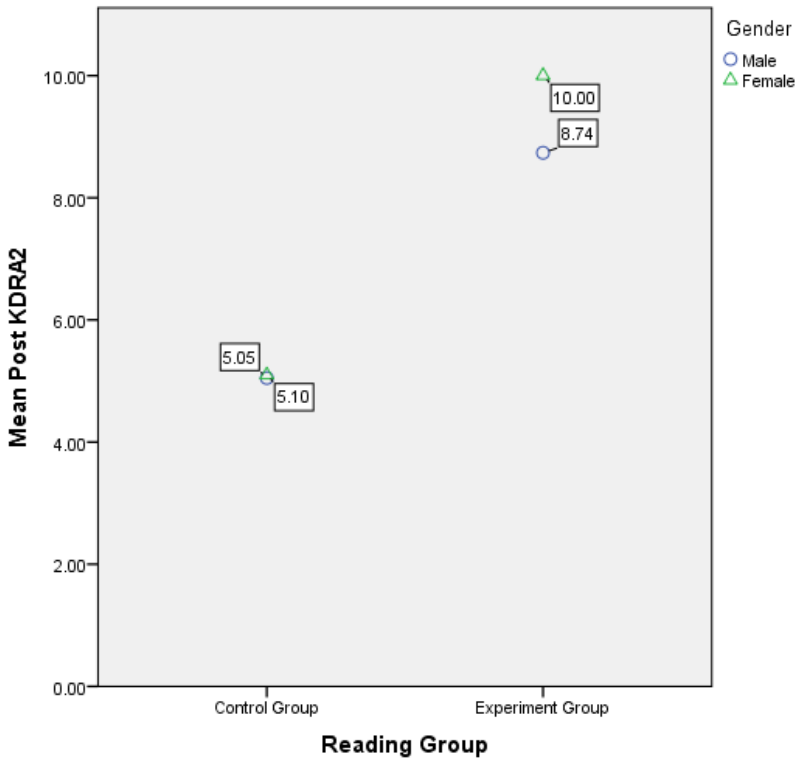


Figure D1. Means plot of male and female post-KDRA2 scores by reading group.

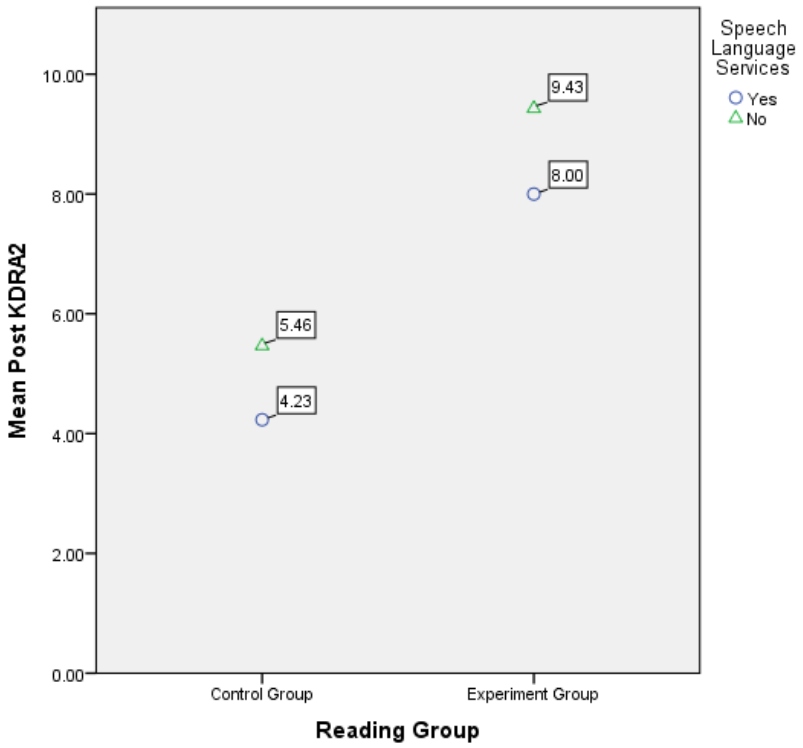


Figure D2. Means plot of post-KDRA2 scores by reading group and speech language service groups.

Table D1

Model Summary of Moderated ANCOVA Analysis for Hypothesis 1A

Source	Type III sum of squares	Df	Mean square	*F*	Sig.	Partial eta squared	Observed power
Corrected Model	273.04	4	318.26	37.62	< .001	.68	1.00
Intercept	156.43	1	156.43	18.49	< .001	.21	.98
Pre KDRA2	949.15	1	947.15	111.9 5	< .001	.62	1.00
Reading Group	137.53	1	137.53	16.25	< .001	.19	.97
Gender	16.80	1	16.80	1.98	.16	.02	.28
Interaction	5.20	1	5.20	0.61	.43	.009	.12
Error	575.28	68	8.46	-	-	-	-
Total	5328.00	73	-	-	-	-	-
Corrected Total	1848.32	72	-	-	-	-	-

Note. Dependent Variable: Post KDRA2, Interaction = Reading Group * Gender, (-) denotes no computation.

Table D2

Model Summary of Moderated ANCOVA Analysis of Hypothesis 1B

Source	Type III sum of squares	*df*	Mean square	*F*	Sig.	Partial eta squared	Observed power
Corrected Model	1,277.66	4	319.41	38.06	< .001	.69	1.00
Intercept	74.07	1	74.07	8.82	.004	.11	.83
Pre KDRA2	943.46	1	943.46	112.42	< .001	.62	1.00
Reading Group	47.68	1	47.68	5.68	.02	.07	.65
SLS Group	23.38	1	23.38	2.78	.100	.03	.37
Interaction	1.43	1	1.43	0.17	.68	.003	.06
Error	570.66	68	8.39	—	—	—	—
Total	5,328.00	73	—	—	—	—	—
Corrected Total	1,848.32	72	—	—	—	—	—

Note. Dependent Variable: Post KDRA2, Interaction = Reading Group * SLS Group, (-) denotes no computation

Appendix E

Results of Hypothesis 2

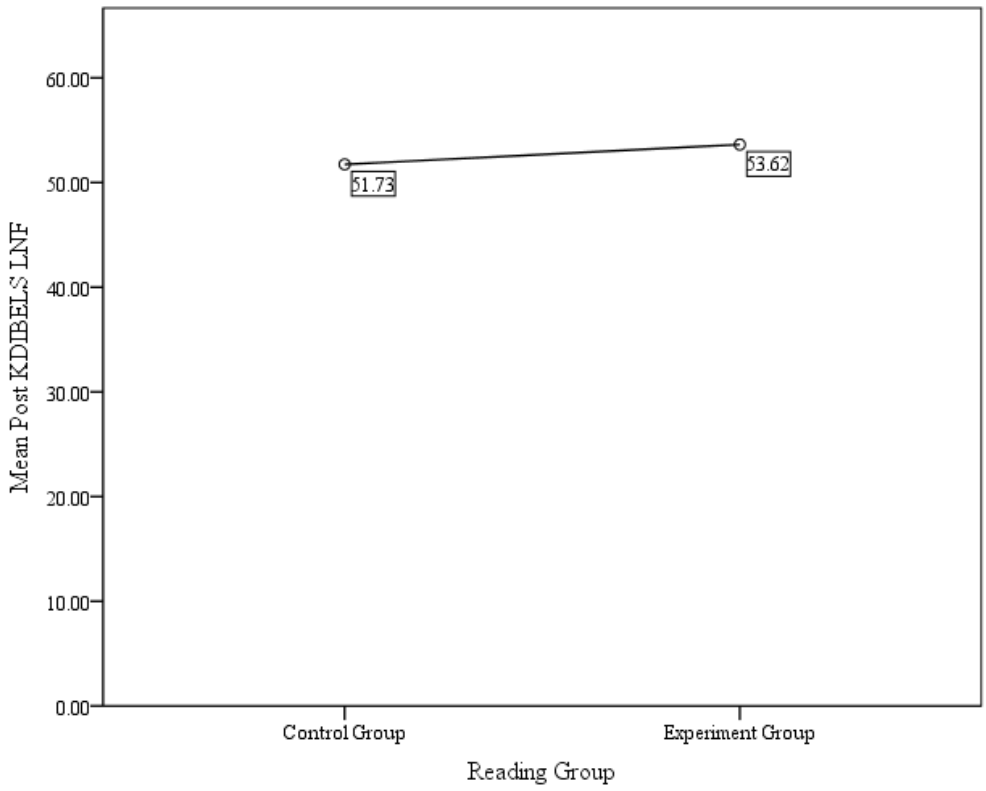


Figure E1. Means plot of post-KDIBELS LNF scores by reading group.

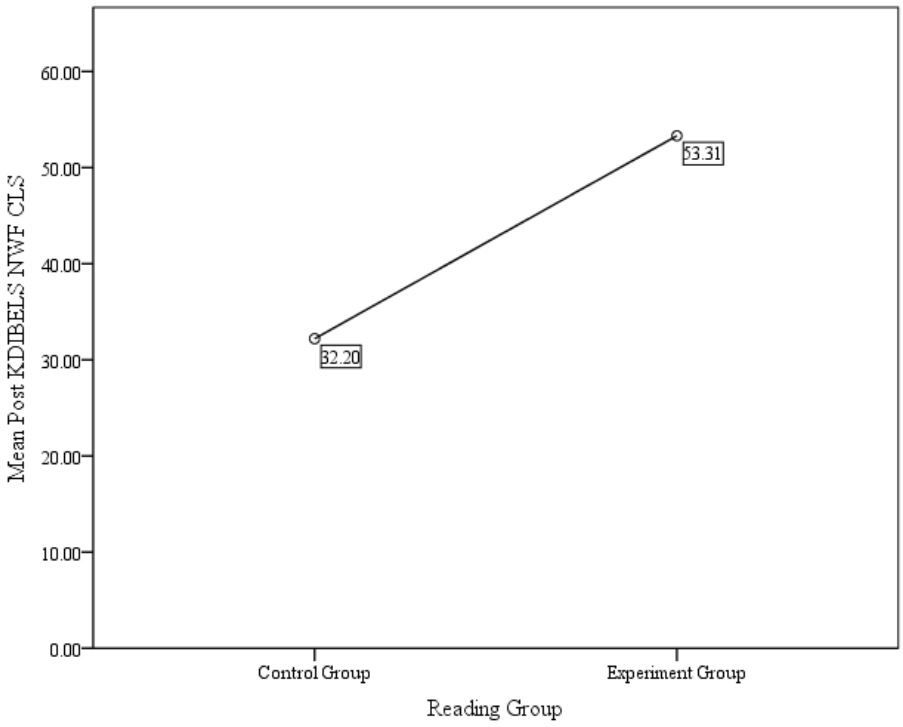


Figure E2. Means plot of post-KDIBELS NWF-CLS scores by reading group.

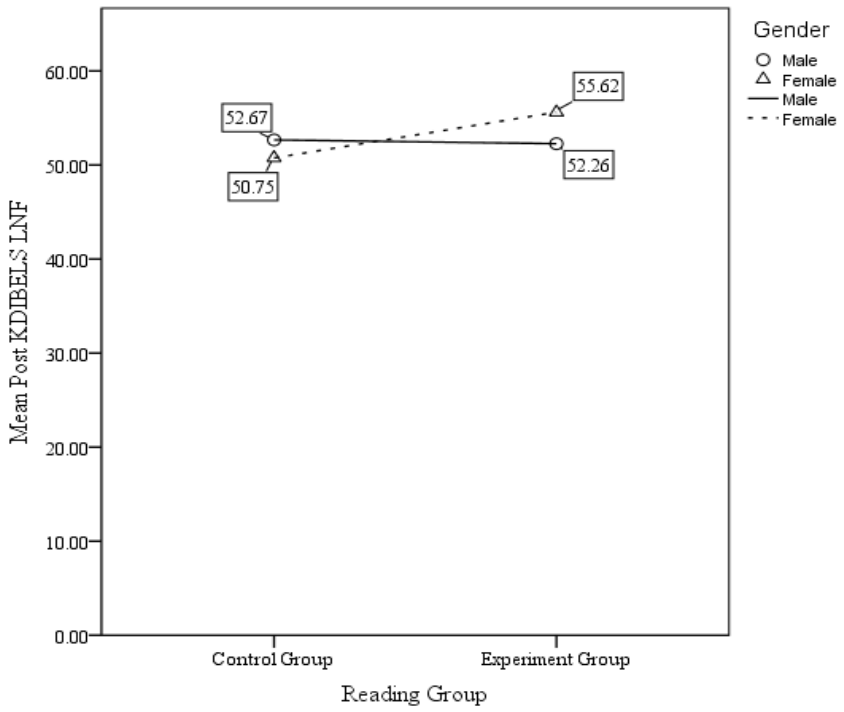


Figure E3. Means plot of male and female Post KDIBELS LNF scores by reading group.

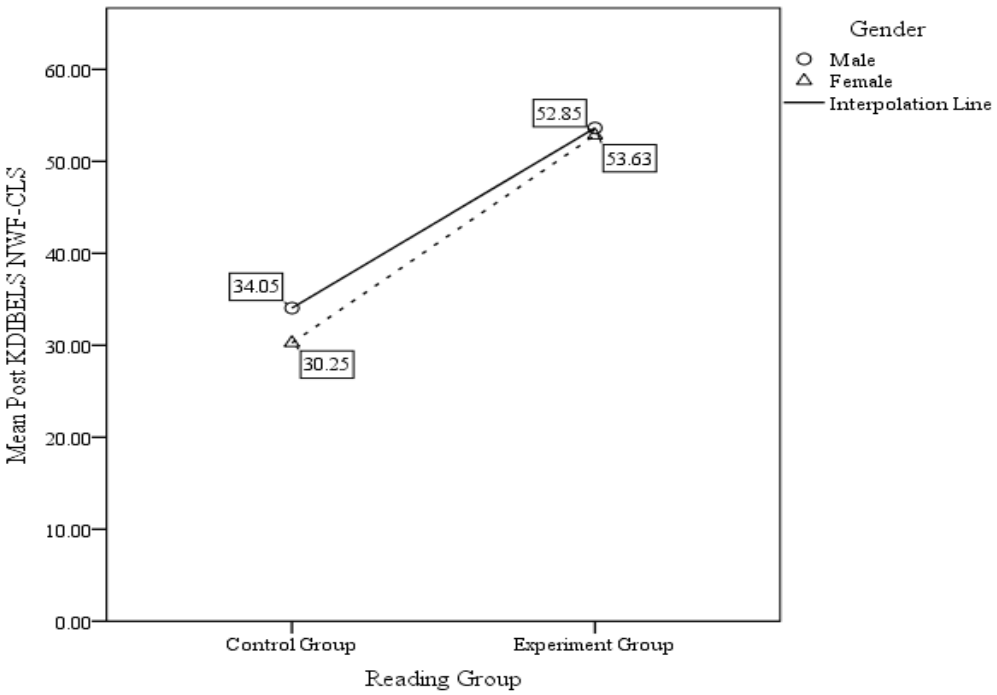


Figure E4. Means plot of male and female post-KDIBELS NWF-CLS scores by reading group.

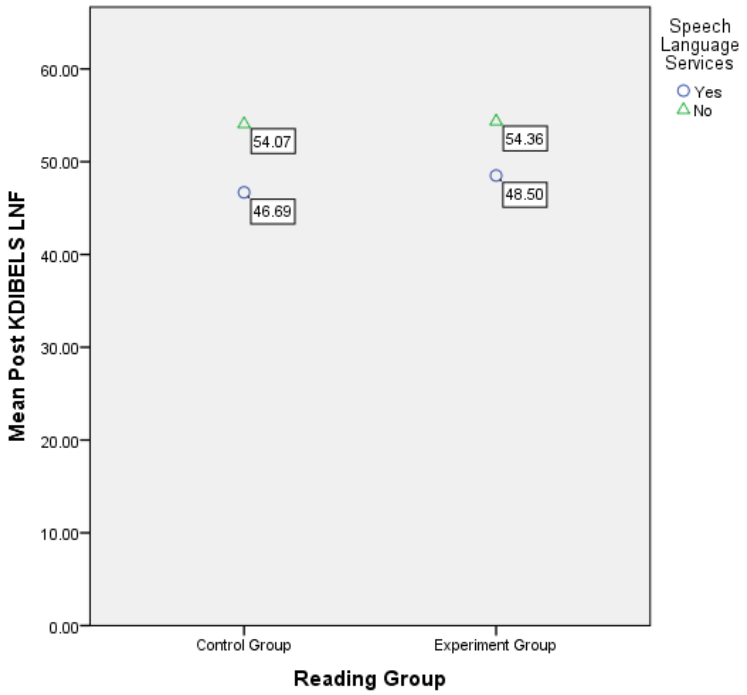


Figure E5. Means plot of post-DIBELS LNF scores by reading group and speech language service groups.

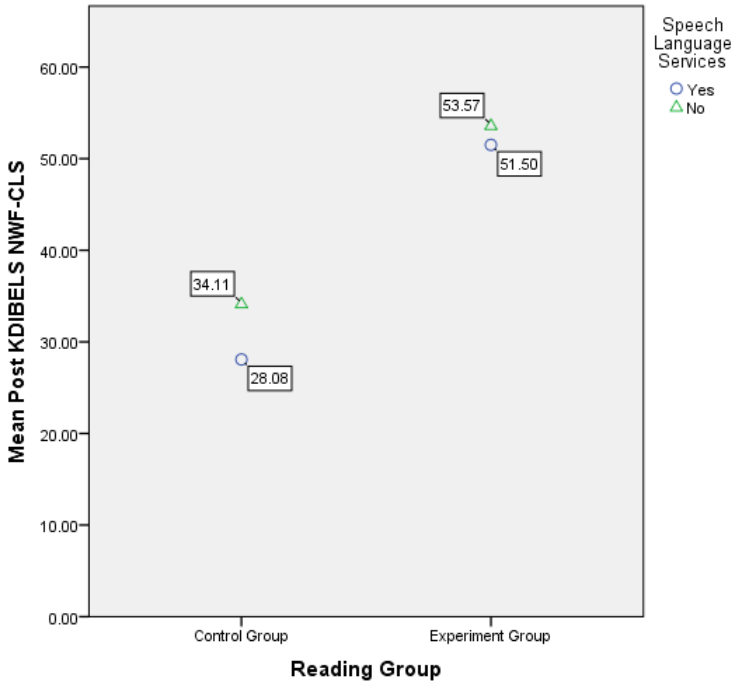


Figure E6. Means plot of post-DIBELS NWF-CLS scores by reading group and speech language service groups.

Table E1

Summary of Multivariate Tests Derived from Moderated MANCOVA Analysis of H2A

Effect	Wilks' statistic	*F*	Hypothesis *df*	Error *df*	Sig.	Partial eta-squared
Intercept	0.44	41.18	2	66	< .001	.55
Pre KDIBELS LNF	0.76	9.98	2	66	< .001	.23
Pre KDIBELS NWF-CLS	0.63	18.85	2	66	< .001	.36
Reading Group	0.69	14.79	2	66	< .001	.30
Gender	0.99	0.31	2	66	.73	.009
Interaction	0.97	0.92	2	66	.40	.02

Table E2

Model Summary Tests Between-Subject Effects from Moderated MANCOVA Analysis of H2A

Dependent variable	Type III sum of squares	*df*	Mean square	*F*	Sig.	Partial eta-squared
Post KDIBELS LNF	199.97	1	199.97	1.79	.18	.02
Post KDIBELS NWF-CLS	94.56	1	94.56	0.42	.51	.006

Note. Source: Interaction (Reading Group × Gender)

Table E3

Summary of Multivariate Tests Derived from Moderated MANCOVA Analysis of H2B

Effect	Wilks' statistic	*F*	Hypothesis *df*	Error *df*	Sig.	Partial eta-squared
Intercept	0.48	35.51	2	66	< .001	.51
Pre KDIBELS LNF	0.77	9.43	2	66	< .001	.22
Pre KDIBELS NWF-CLS	0.65	17.28	2	66	< .001	.34
Reading Group	0.80	8.18	2	66	.001	.19
SLS	0.98	0.62	2	66	.54	.01
Interaction	0.99	0.07	2	66	.92	.002

Note. Design: Intercept + Post KDIBELS LNF + Post KDIBELS NWF-CLS + Reading Group + SLS + Interaction. Interaction = Reading Group * SLS

Table E4

Model Summary for Tests Between-Subject Moderated MANCOVA H2B

Dependent variable	Type III sum of squares	*df*	Mean square	*F*	Sig.	Partial eta-squared
Post KDIBELS LNF	0.83	1	0.83	0.007	.93	< .001
Post KDIBELS NWF-CLS	33.91	1	33.91	0.15	.700	.002

Note. Source: Interaction (Reading Group × SLS)

Appendix F

Results of Hypothesis 3

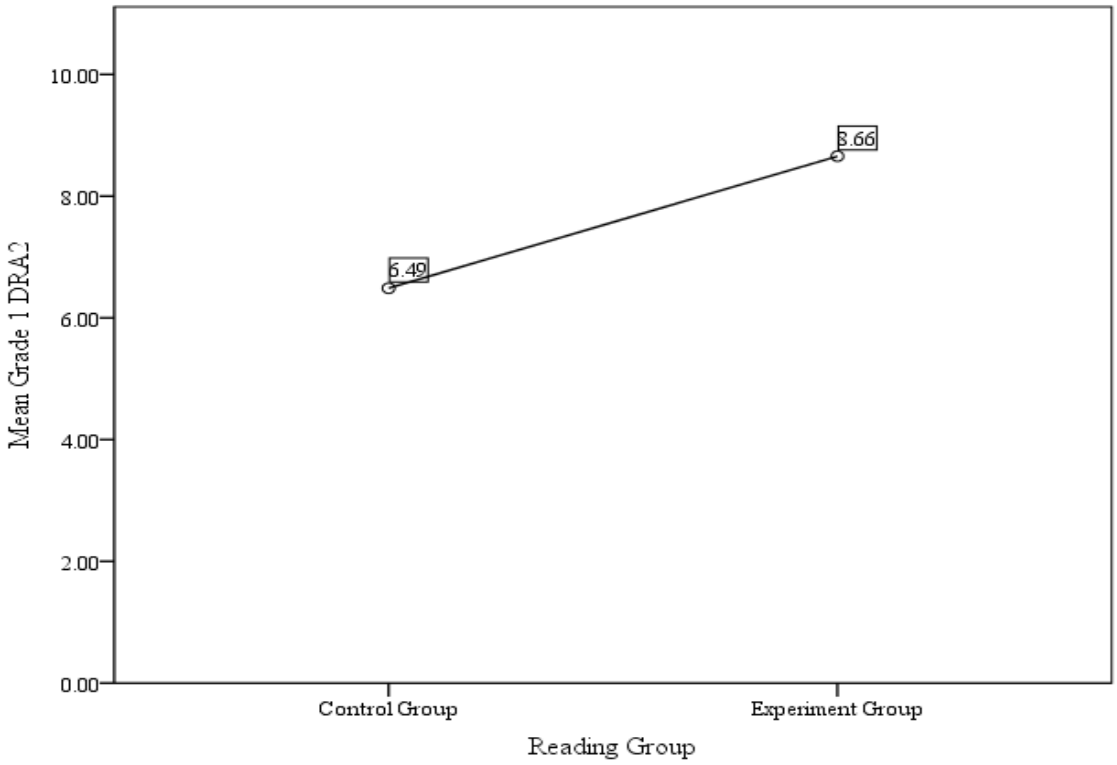


Figure F1. Means plot of Grade 1 DRA2 scores by reading groups.

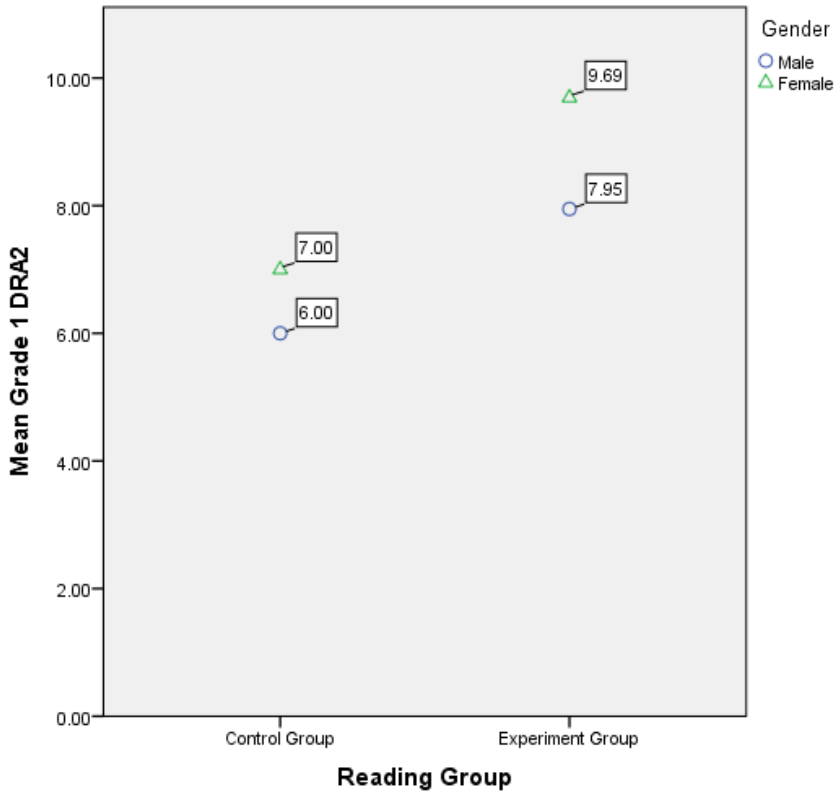


Figure F2. Means plot of male and female Grade 1 DRA2 scores by reading group.

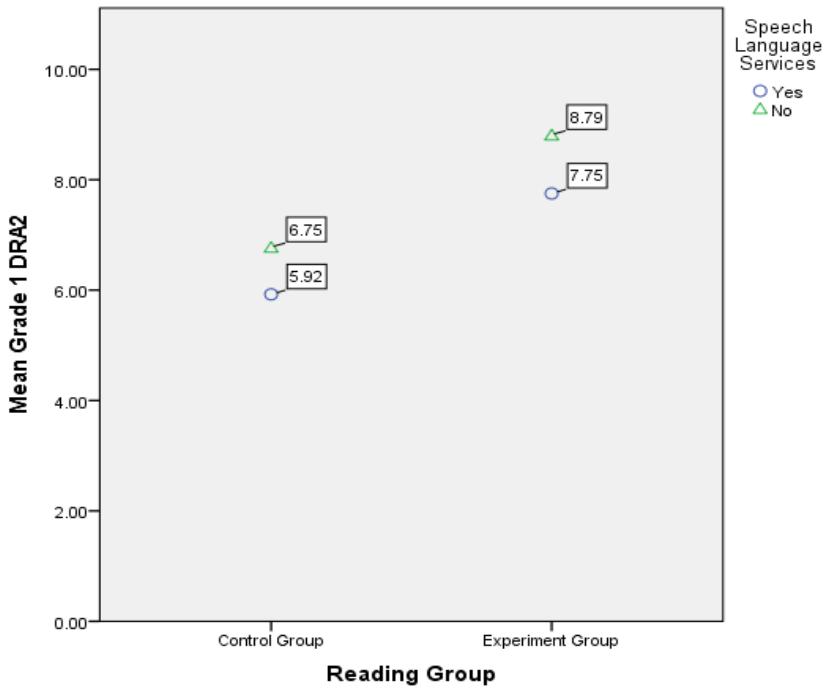


Figure F3. Means plot of Grade 1 DRA2 scores by reading group and speech language service groups.

Table F1

Model Summary of ANCOVA Analysis for H3

Source	Type III sum of squares	*df*	Mean square	*F*	Sig.	Partial eta squared	Observed power
Corrected Model	84.51	1	84.51	2.98	.08	.04	.40
Intercept	4,121.88	1	4121.88	145.78	< .001	.67	1.00
Reading Group	84.51	1	84.51	2.98	.08	.04	.40
Error	2,007.46	71	28.27	—	—	—	—
Total	6,131.00	73	—	—	—	—	—
Corrected Total	2,091.97	72	—	—	—	—	—

Note. Dependent Variable: Grade 1 DRA2.

Table F2

Model Summary of Moderated ANOVA Analysis of H3A

Source	Type III sum of squares	*df*	Mean square	*F*	Sig.	Partial eta squared	Observed power
Corrected Model	118.25	3	39.41	1.37	.25	.05	.35
Intercept	4132.70	1	4,132.47	144.46	< .001	.67	1.00
Reading Group	94.75	1	94.75	3.31	.07	.04	.43
Gender	33.16	1	33.16	1.16	.28	.01	.18
Interaction	2.44	1	2.44	0.08	.77	.001	.06
Error	1973.71	69	28.60	—	—	—	—
Total	6131.00	73	—	—	—	—	—
Corrected Total	2091.97	72	—	—	—	—	—

Note. Dependent Variable: Grade 1 DRA2, Interaction = Reading Group * Gender, (-) denotes no computation.

Table F3

Model Summary of Moderated ANCOVA Analysis for H3B

Source	Type III sum of squares	*df*	Mean square	*F*	Sig.	Partial eta squared	Observed power
Corrected Model	94.33	3	31.44	1.08	.36	.04	.28
Intercept	2,141.70	1	2,141.70	73.97	< .001	.51	1.00
Reading Group	37.45	1	37.45	1.29	.26	.01	.20
SLS	8.70	1	8.70	0.30	.58	.004	.08

Interaction	0.10	1	0.10	0.004	.95	< .001	.05
Error	1,997.63	69	28.95	—	—	—	—
Total	6,131	73	—	—	—	—	—
Corrected Total	2,091.97	72	—	—	—	—	—

Note. Dependent Variable: Grade 1 DRA2, Interaction = Reading Group * SLS.

Appendix G

Results of Hypothesis 4

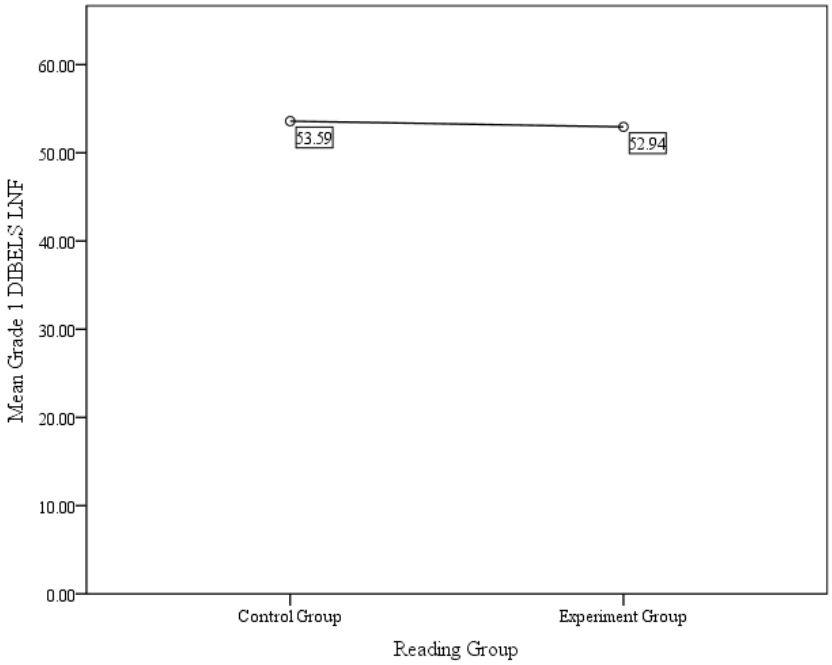


Figure G1. Means plot of Grade 1 DIBELS LNF scores by reading group.

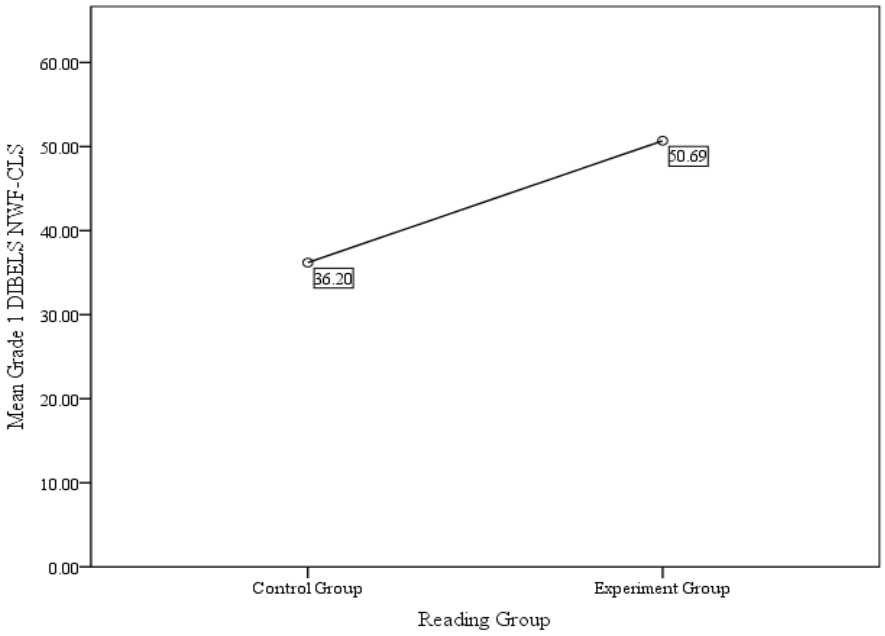


Figure G2. Means plot of Grade 1 DIBELS NWF-CLS scores by reading group.

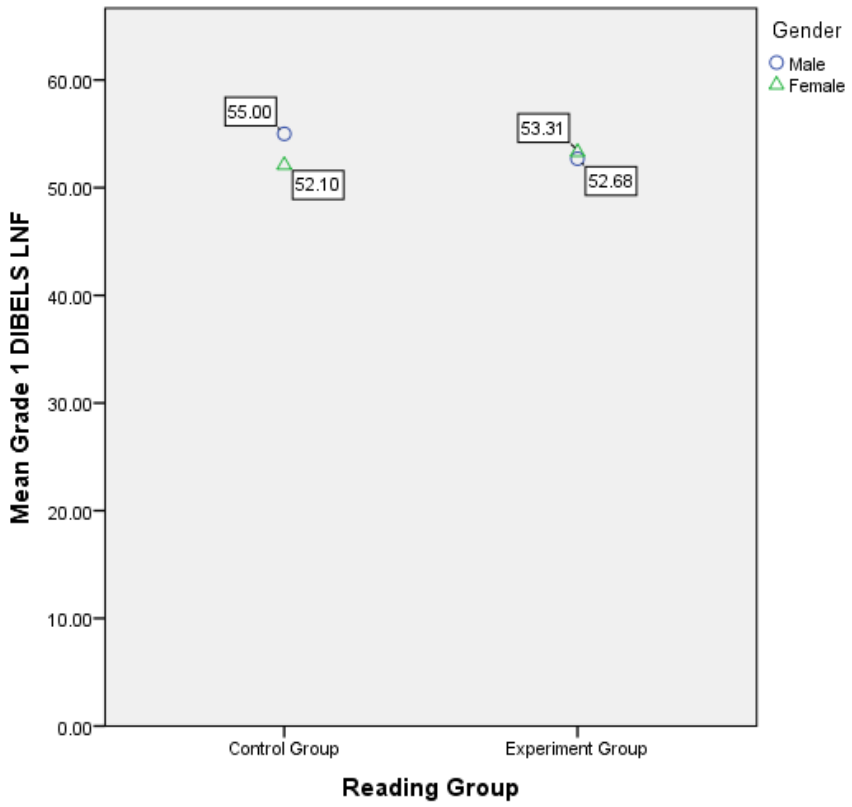


Figure G3. Means plot of male and female Grade 1 DIBELS LNF scores by reading group.

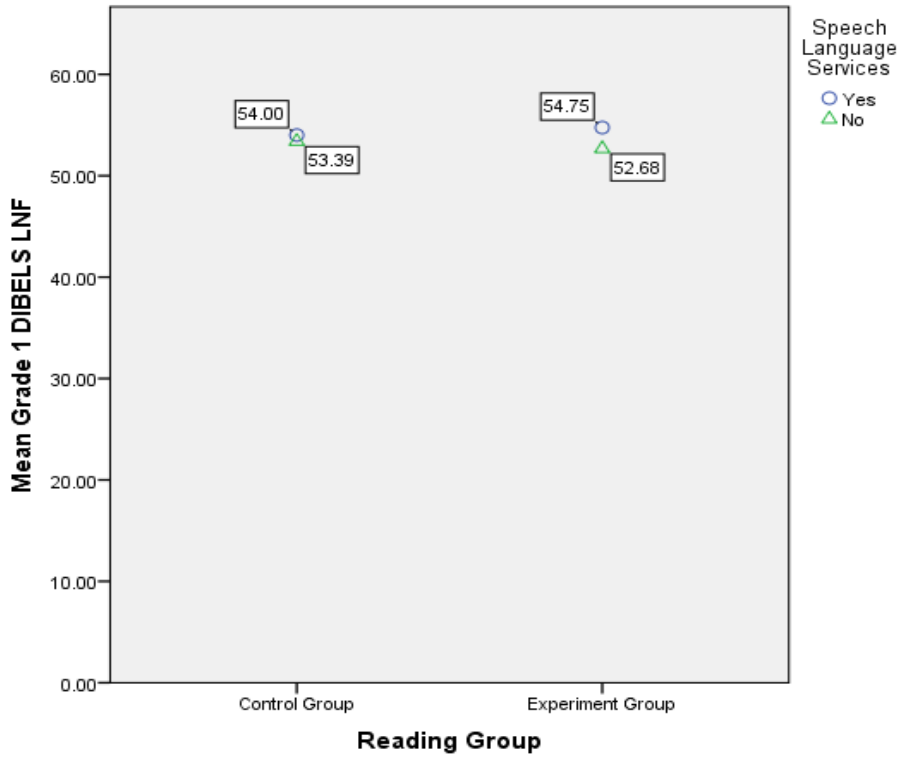


Figure G4. Means plot of Grade 1 DIBELS LNF scores by reading group and speech language service groups.

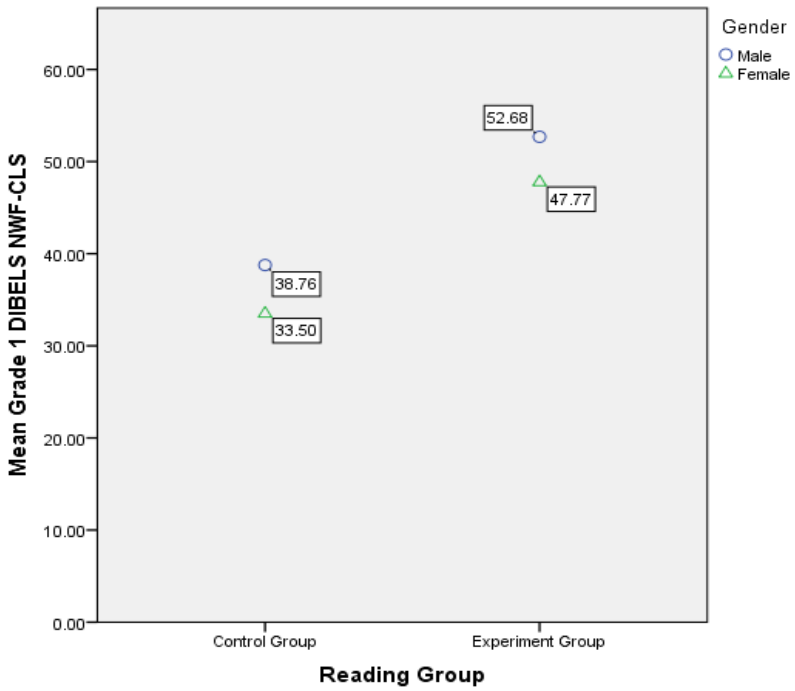


Figure G5. Means plot of male and female Grade 1 DIBELS NWF-CLS scores by reading group.

Table G1

Summary of Multivariate Tests Derived from MANCOVA Analysis of H4

Effect	Wilks' statistic	*F*	Hypothesis *df*	Error *df*	Sig.	Partial eta-squared
Intercept	0.05	642.71	2	70	< .001	.94
Reading Group	0.87	5.23	2	70	.008	.13

Note. Design: Intercept + Grade 1 DIBELS LNF + Grade 1 DIBELS NWF-CLS + Reading Group

Table G2

Model Summary for Tests Between-Subject from MANCOVA Analysis H4

Dependent variable	Type III sum of squares	*df*	Mean square	*F*	Sig.	Partial eta-squared
Grade 1 DIBELS LNF	7.54	1	7.54	0.04	.82	.001
Grade 1 DIBELS NWF-CLS	3,774.76	1	3,774.76	6.54	.01	.08

Table G3

Summary of Multivariate Tests from Moderated MNCOVA of H4A

Effect	Wilks' statistic	*F*	Hypothesis *df*	Error *df*	Sig.	Partial eta-squared
Intercept	0.05	617.03	2	68	< .001	.94
Reading Group	0.87	4.70	2	68	.01	.12
Gender	0.98	0.39	2	68	.67	.01
Interaction	0.99	0.22	2	68	.79	.007

Note. Design: Intercept + Grade 1 DIBELS LNF + Grade 1 DIBELS NWF-CLS + Reading Group + Gender + Interaction. Interaction = Reading Group * Gender.

Table G4

Model Summary for Tests Between-Subjects from Moderated MANCOVA Analysis of H4A

Dependent variable	Type III sum of squares	*df*	Mean square	*F*	Sig.	Partial eta-squared
Grade 1 DIBELS LNF	54.64	1	54.64	0.33	.56	.005
Grade 1 DIBELS NWF-CLS	0.53	1	0.53	0.001	.97	< .001

Note. Source: Interaction (Reading Group × Gender)

Table G5

Summary of Multivariate Tests Derived from Moderated MANCOVA Analysis of H4B

Effect	Wilks' statistic	*F*	Hypothesis *df*	Error *df*	Sig.	Partial eta-squared
Intercept	0.08	353.82	2	68	< .001	.91
Reading Group	0.86	5.20	2	68	.008	.13
SLS	0.99	0.06	2	68	.94	.002
Interaction	0.97	1.01	2	68	.37	.02

Table G6

Model Summary of Tests of Between-Subjects Effects from Moderated MANCOVA Analysis H4B

Dependent variable	Type III sum of squares	*df*	Mean square	*F*	Sig.	Partial eta-squared
Grade 1 DIBELS LNF	5.38	1	5.38	0.03	.85	< .001
Grade 1 DIBELS NWF-CLS	933.16	1	933.16	1.61	.20	.02

Note. Source: Interaction (Reading Group × SLS)