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Metacognitive Reading Strategy and Emerging Reading Comprehension in Students With Intellectual Disabilities

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Natasha Cox-Magno

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2018

Abstract

Metacognitive Reading Strategy and Emerging Reading Comprehension in Students With
Intellectual Disabilities

by

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MA, Adelphi University, 1996

BS, Adelphi University, 1994

Dissertation Submitted in Fulfillment
of the Requirements for the Degree of
Doctor of Education

Walden University

February 2018

Abstract

Historically, students with intellectual disabilities (ID) have low reading comprehension skills that can impede their overall academic success. There is a gap in practice regarding the identification and effective use of evidence-based reading comprehension instructional strategies for students with ID. Guided by Piaget's and Vygotsky's constructivist theories, the purpose of this study was to test the effectiveness of a metacognitive reading strategy on the emerging reading comprehension (ERC) skills of kindergarten students with ID. A single-participant, multiple baseline design with graphical visual analysis was used across 4 kindergarten students with ID to illustrate the influence of the reading intervention. All 4 kindergarten students showed increases in their ERC skills after the completion of the intervention. An effect-size statistic was calculated to measure the improvement in percentage rate of correct responses between each participant's baseline and intervention phase. The effect-size results indicated a 60% to 80% improvement rate difference. Therefore, for these kindergartners, the metacognitive reading strategy significantly increased the ERC skills of the participants. The implications for social change include providing teachers with effective metacognitive instructional strategies for ERC skills and for improving ERC skills among students with ID, thus, allowing ID students greater opportunity to benefit from curriculum and instruction over time.

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Dedication

I would like to dedicate this research study to my parents, Alejandro and Rosella Cox. Alejandro Cox (my father) and Rosella Cox (my mother) instilled in me the strength, tenacity, and focus to complete any goal. Both parents supported me by providing not only a top-notch education, but also a loving home environment. My father's famous words to me are "You must earn your accomplishments" and "Don't worry; everything will work out." My mother's famous words to me are "Education is something no one can take from you" and "When you have all of your tools in your belt, no one can stop you from accomplishing your goals."

Also, I would like to dedicate my research study to my sisters, Bridgette Cox-Francis and Tiffany Cox. Bridgette Cox-Francis has supported me throughout my educational life's journey by helping me with my homework in my elementary educational years and taking care of me when my parents were at work. Bridgette's famous words to me are "Always have a Plan A and B." Tiffany has shown me that when children are given what they need, they can accomplish anything.

Finally, I would like to dedicate my research study to my husband, Dave Magno. Dave supported me through endless nights of assisting me with ensuring that my reference page aligns with my citations in my assigned papers. Also, he provided encouragement when my class assignments seemed impossible.

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Table of Contents

List of Tables	iv
List of Figures	v
Chapter 1: Introduction to the Study.....	1
Background	1
Problem Statement	6
Purpose of the Study	9
Research Question(s) and Hypotheses	9
Theoretical Foundation	10
Nature of the Study	11
Definitions	13
Assumptions	13
Scope and Delimitations	13
Scope	13
Delimitations	14
Limitations	14
Researcher Bias	15
Significance	15
Summary	16
Chapter 2: Literature Review	17
Literature Search Strategy	17
Theoretical Foundation	18
Literature Review Related to Key Concepts and Variable	21

Working Memory.....	21
Oral Language and Reading Comprehension	23
Measuring the Reading Comprehension Learning Performances of Students With Intellectual Disabilities.....	24
Metacognitive Reading Strategies, Instructional Strategies, and Reading Comprehension for Students With Intellectual Disabilities.....	28
Metacognitive Reading Strategies and Instructional Strategies to Support Increasing Comprehension of Expository Text for Students With Intellectual Disabilities	35
Metacognitive Reading Strategies, Instructional Reading Strategies, and Technology for Students With Intellectual Disabilities.....	37
Home Literacy Environment and Emergent Literacy.....	42
Emergent Literacy and Shared Read-Alouds.....	44
Constant Time Delay	47
Summary and Conclusions	47
Chapter 3: Research Method.....	50
Setting.....	50
Research Design and Rationale	51
Design Choice.....	51
Defending the Choice of Intervention.....	52
Methodology.....	52
Population Selection	53
Procedures for Recruitment, Participation, and Data Collection.....	54

Intervention	55
Instrumentation and Operationalization of Constructs	56
Data Analysis Plan	57
Threats to Validity	58
Internal Validity	58
External Validity	59
Ethical Procedures	59
Summary	60
Data Collection	61
Baseline Descriptive and Demographic Characteristics of the Sample	61
Intervention Fidelity	63
Data Analysis	63
Results	64
Summary	69
Interpretation of the Findings	72
Limitations of the Study	73
Recommendations	74
Implications	75
References	77
Appendix A: Copyright Permission	93
Appendix B: Permission to Use the Unique Learning System	94
Appendix C: Data Collection Permission	95

List of Tables

Table 1. Demographic Data of Participants63

List of Figures

Figure 1. Participant 1 responses before and during assessment of a metacognitive reading strategy (intervention).....	66
Figure 2. The second participant's responses before and during the assessment of a metacognitive reading strategy (intervention)	67
Figure 3. The third participant's responses before and during the assessment of a metacognitive reading strategy (intervention)	68
Figure 4. The fourth participant's responses before and during the assessment of a metacognitive reading strategy (intervention)	69

Chapter 1: Introduction to the Study

The topic of this study was emerging reading comprehension. Emerging reading comprehension (ERC) is a prerequisite literacy skill learned through interactive reading engagement, before formal classroom literacy instruction. Many researchers have indicated that children with intellectual disabilities who do not have adequate exposure to ERC will have difficulty with their future reading comprehension skills (Edwards, 2014; Girard, Girolametto, Weitzman, & Greenberg, 2013; Kucirkova, Messer, & Whitelock, 2012; Schryer, Sloat, & Letourneau, 2015). Typically, the ERC skills of children without disabilities will develop by kindergarten (Schnorr, 2011). However, in students with intellectual disabilities, ERC skills can be delayed beyond the first grade (Schnorr, 2011). This study may have implications for positive social change, in that the findings may support transformation of the way in which special educators think about teaching ERC to kindergarten students with intellectual disabilities by informing them about a potentially successful metacognitive reading strategy to support such students' future reading comprehension skills. The major sections contained in this chapter cover the study's background, problem statement, purpose, limitations, and significance.

Background

In the past, many people with intellectual disabilities were exposed to unequal educational opportunities (Courtade, Test, & Cook, 2015; U.S. Department of Education, 2016a, 2016b; Yell, Rogers, & Lodge Rogers, 1998). People with intellectual disabilities were sent to mental institutions to live; some were sent to schools that did not meet their learning needs, and others were not allowed to attend school. After the compulsory

education law was passed mandating that all children attend school, many states passed laws to prevent children with disabilities from attending (Yell et al., 1998). The following court rulings and laws prevented students with disabilities from attending school:

1. In *Watson v. City of Cambridge* (1983) the Massachusetts Judicial Supreme Court ruled that children with a disability could not attend school.
2. In 1919, in *Beattie v. Board of Education*, the Wisconsin Supreme Court ruled that school officials could expel students with disabilities from school.
3. In 1934, the Cuyahoga County Court of Appeals in Ohio allowed school officials to stop students with disabilities from attending school.
4. In 1958, in the *Department of Public Welfare v. Haas*, the Supreme Court of Illinois ruled that states did not have to provide a free and appropriate education to students with disabilities.
5. In 1969, the state of North Carolina passed a law making it a crime for parents to pursue the enrollment of their children with disabilities in school.

In 1954, the decision in *Brown v. the Board of Education* allowed minorities equal opportunities based on the Fourteenth Amendment of the U.S. Constitution (Yell et al., 1998). This Supreme Court ruling was the foundation for future educational laws and policies.

Parents who had children with disabilities began to form advocacy groups to improve deprived school environments and increase school integration for students with disabilities (U.S. Department of Education, 2016a, 2016b; Yell et al., 1998). The

Cuyahoga County (Ohio) Council for the Retarded Child was formed in 1933. This council consisted of five mothers with children classified as having intellectual disabilities. The purpose of this advocacy group was to support parents, provide a place for parents to express themselves, and make changes to local laws. This advocacy group set the stage for the development of future advocacy groups. In September 1950, the National Association for Retarded Citizens was created in Minnesota. In 1922, the Council for Exceptional Children (CEC) was formed in New York City. The Association for Persons With Severe Handicaps (TASH) was established in 1974. The United Cerebral Palsy Association was established in 1949. The National Society for Autistic Children was started in 1961. The National Association for Down Syndrome began in 1961. The Association for Children With Learning Disabilities (ACLD) was formed in 1964. Families for Children's Mental Health was established in 1988.

With the support of families and advocacy groups, a multitude of federal laws were passed that required the use of evidence-based practice, provided funding to states that educated individuals with disabilities, and provided support to integrate people with disabilities in schools (U.S. Department of Education, 2016a, 2016b; Yell et al., 1998). These laws include the following:

1. The Training Professional Personnel Act of 1959, Caption Films Act of 1958, and Teachers of the Deaf Act of 1961 provided people with training on how to care for people with disabilities.
2. The Elementary and Secondary Education Act of 1965, State School Act of 1965, Handicapped Children's Early Education Assistance Act of 1968, and

Economic Opportunities Amendments of 1972 provided funding to states that educated students with disabilities.

3. Rulings in *Pennsylvania Association for Retarded Citizens (PARC) v. Commonwealth* (1971) and *Mills v. the Board of Education of the District of Columbia* (1972) required states to educate students with disabilities.

Many programs and services for people with disabilities emerged as a result of effective evidence-based strategies for people with disabilities. The foundational laws noted above supported students with intellectual disabilities not only by allowing them to attend schools with programs that met their needs, but also by providing teachers with the educational knowledge to meet their learning needs.

Amendments to the special education laws were advantageous in expanding educational opportunities to include more people (Christle & Yell, 2010; Courtade et al., 2015; Goldstein, 2011; U.S. Department of Education, 2016a, 2016b; Yell et al. 1998). In 1975, the Education for All Handicapped Children Act (EHA) required states to provide a free and appropriate education to all children aged 3-21 years. Amendments to EHA were implemented to meet the needs of all students with intellectual disabilities. In 1986, EHA was extended to children with disabilities from birth to 21 years of age. This amendment supported meeting the learning needs of students with disabilities by providing early intervention services and the implementation of Individualized Family Service Plans (IFSPs). In 1990, EHA was renamed the Individuals With Disabilities Education Act (IDEA). The 1990 amendment to IDEA required states to prepare high school students with disabilities for post-high-school independent living. Additionally, in

the 1980s, IDEA supported educating students with disabilities with their nondisabled peers and the use of culturally responsive instructional practices. Thus, amendments to EHA and IDEA provided special education services to individuals from birth to 21 years of age.

The reauthorization of educational laws not only required the opportunity for students with disabilities to be placed in the least restrictive environment (LRE), but also required justification for them being placed in the LRE (Breecher & Childre, 2012; Goldstein, 2011). IDEA of 1997 and the reauthorization of IDEA in 2004 required educators to give students with disabilities access to the general education curriculum. The 2001 reauthorization of the Elementary and Secondary Education Act required outcome measures regarding state literacy standards, the establishment of the National Reading Panel, the evaluation of evidence-based instruction (literacy and math), and implications for practice.

Gap in practice. Cooks and Cooks (2011) explained that a gap in special education research occurs when a documented evidence-based practice does not exhibit favorable student outcomes for a study's population. Unfavorable student outcomes can be due to not having valid evidence-based research to support the learning needs of students and the instructional needs of special educators (Cooks & Cooks, 2011). For an instructional strategy to be deemed valid, a supportive study must be conducted with high quality (Cooks & Cooks, 2011). In a high-quality study, the researcher ensures that the study results are due to the intervention, that the correct research design is implemented, that the study is conducted with fidelity, and that the study's outcomes are reliable

(Cooks & Cooks, 2011). The gap in practice that I addressed was the evidence-based practice gap. Courtade et al. (2015) contended that there is a need for more high-quality evidence-based single subject design studies to address instructional strategies regarding students with intellectual disabilities. Therefore, this study was needed to address the gap in practice by potentially providing special educators with high quality evidence-based instructional strategies for kindergarten students with intellectual disabilities using a single subject design that produced positive student learning performance.

Problem Statement

A problem exists involving low reading comprehension abilities in students with intellectual disabilities (Biligi & Ozmen, 2014; Conner, Alberto, Compton, & O' Conner, 2014; Reichenberg, 2014). This precursor skill to reading comprehension is often referred to as ERC (Edwards, 2014; Sandvik, Daal, & Ader, 2014; Schryer et al., 2015). ERC is defined as students acquiring knowledge about comprehension through experiences with literature prior to traditional literacy instruction (McNaughton, 2014; Rohde, 2015). Sandvik et al. (2014) described ERC as consisting of two components: social interaction and direct instruction. At first, it was understood that the emergence of a child's literacy skills only occurred through social interactions (Sandvik et al., 2014). Recently, researchers discovered that direct instruction is another important element in the emergence of a child's literacy skills (Sandvik et al., 2014). In the case of ERC, *direct instruction* refers to organized systematic guidance, not traditional systematic classroom instruction (Sandvik et al., 2014). Furthermore, when the culture and community of students with intellectual disabilities do not provide them with the

opportunity to develop ERC skills, their reading comprehension abilities may be low (Rohde, 2015). In other words, children who are not exposed to planned, systematic ERC guidance prior to traditional classroom instruction may suffer in terms of poor future comprehension skills.

There is a gap in special education practice regarding effective metacognitive strategies to address the low ERC skills of students with intellectual disabilities (Courtade et al., 2015; Spooner & Browder, 2015; Test, Bartholomew, & Bethune, 2015). Many researchers have indicated that there are limited evidence-based metacognitive practices to address the low ERC skills of students with intellectual disabilities (Browder, Hudson, & Wood, 2013; Hill & Lemons, 2015; McLaughlin, Smith, & Wilkinson, 2012; National Center on Educational Outcomes, 2014). Cook and Cook (2011) stated that the research-to-practice gap may be addressed by implementing evidence-based research to improve students' academic outcomes. ERC may be impeded in kindergarten students with intellectual disabilities due to a lack of effective metacognitive reading strategies. A statement presented by the 2015 Annual Disability Statistics Compendium indicated that 411,048 students with intellectual disabilities received special education services under the Individuals With Disabilities Act (Houtenville, Brucker, & Lauer, 2016). Students with intellectual disabilities continue to have weak ERC skills that impact their ability to read the level of text required to meet grade-level standards (The Arc, 2015; Beecher & Childre, 2012; New York State Education Department, 2015; Reichenberg, 2014; Watson, Gable, Gear, & Hughes, 2012). Although kindergarten students with intellectual disabilities receive special education services, there is still a need to address the gap in

special education practices by investigating effective metacognitive reading instructional strategies to improve low reading ERC in this population.

Educators can assist students with intellectual disabilities by implementing an evidence-based intervention to enhance the ERC process (Hudson, Browder, & Wakeman, 2013). One strategy that has shown some success in increasing the ERC skills of students with and without disabilities, but that has not demonstrated success with kindergarten students with intellectual disabilities, is one version of a metacognitive reading strategy. In students with intellectual disabilities, weak ERC skills contribute to cognitive deficits in working memory, inhibition, language, and updating (Biligi & Ozmen, 2014; Conner et al., 2014; Danielsson, Henry, Messer, & Ronnberg, 2012; Fajardo et al., 2014; Molen, Henry, & Luit, 2014; Trezise, Gray, Taffe, & Sheppard, 2014). Hudson and Test (2011) discussed using shared story reading to increase ERC skills for at-risk preschoolers, kindergarten students, and students with mild intellectual disabilities. Qanwal and Karim (2014) suggested that teachers who ask students questions during reading can increase ERC. Beecher and Childre (2012) used a metacognitive reading strategy to increase the ERC skills of students with intellectual disabilities aged 7-10 years. Broek, Kendou, Lousberg, and Visser (2011) showed that a metacognitive reading strategy can increase the ERC skills of students ages 2-9 years. Additionally, Broek et al. stated that the metacognitive reading intervention used in their study to increase the ERC skills of students aged 2-9 years should be implemented to its full capacity in various ways.

Purpose of the Study

The purpose of this study was to examine the effects of a metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities. The analyzed results add to the evidence-based literature on effective instructional practices for students with intellectual disabilities at the kindergarten level. Some metacognitive reading strategies can be described as planned questioning techniques used to increase ERC skills (Yang, 2011). I employed a teacher-produced questioning technique based on the works of Broek et al. (2011). I used a single-participant design to evaluate the effectiveness of a metacognitive reading strategy in supporting the ERC skills of kindergarten students with intellectual disabilities.

Research Question(s) and Hypotheses

The focus of this study was determining the effects of a metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities. The study's research question was the following: What are the effects of the use of a metacognitive reading strategy while reading a passage on the ERC skills of kindergarten students with intellectual disabilities? The following was the null and alternative hypotheses:

*H*₀. The metacognitive reading strategy did not significantly affect the ERC skills of kindergarten students with intellectual disabilities.

*H*₁. The metacognitive reading strategy significantly affected the ERC skills of kindergarten students with intellectual disabilities.

The independent variable was the metacognitive reading strategy; the dependent variable was the number of correct responses by the participants.

Theoretical Foundation

Constructivist theory was the framework used to support and guide this study. Constructivist theory, based on the works of Vygotsky and Piaget, involves the idea that learners actively build on current or prior knowledge to construct meaning using a scaffolding metacognitive approach (Bates, 2016; Doolittle, 2014; Sharma, 2014; Yoder, 2014). Students with intellectual disabilities have working memory deficits. In the context of reading the cognitive process of working memory involves a person remembering what was read as the text is continuously presented, combining old and new textual information, and developing an understanding of the topic (Conner et al., 2014; Watson et al., 2012). The scaffolding metacognitive approach provides a way for educators to chunk the information from a passage to support participants' understanding of the passage. Chunking the information from the passage assists the participants' working memory by allowing them to combine knowledge about the passage gradually to comprehend the entire passage.

Constructivist theory supported my study, which involved applying an explicit scaffolding metacognitive strategy, with guidance, to support the thought process of the participants toward developing an understanding of a text. The research question was related to constructivist theory because it involved whether an evidence-based metacognitive reading strategy would impact the instructional and learning ERC practices

of students with intellectual disabilities. There is a more detailed explanation of the study's theoretical foundation in Chapter 2.

Nature of the Study

I implemented a quantitative research design to investigate the effects of a metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities. The quantitative research design I used in this study was a single-participant design. Single-participant designs are intended to demonstrate whether an independent variable will affect a dependent variable (Byiers, Reichle, & Symons, 2012; Horner & Baer, 1978; Laureate Education, Inc., 2012; O'Neill, McDonnell, Billingsley, & Jenson, 2011; Rumrill, Cook, & Wiley, 2011). The single-participant design I used was a multiple baseline design. A multiple baseline design was used to determine whether the metacognitive reading strategy affected the ERC skills of kindergarten students with intellectual disabilities. A multiple baseline design can be used across two or more conditions (Byiers et al., 2012; Horner & Baer, 1978; Laureate Education, Inc., 2012; O'Neill et al. 2011; Rumrill et al., 2011). The multiple baseline design in this study was implemented across four kindergarten participants with intellectual disabilities. In addition, I used a multiple baseline design because such a design can confirm, through systematic replication, the external validity of an intervention (Byiers et al., 2012; Horner & Baer, 1978; Laureate Education, Inc., 2012; O'Neill et al., 2011; Rumrill et al., 2011). Furthermore, due to the small sample size, I was able to use a single-participant design to implement intracomparison (Byiers et al., 2012; O'Neill et al., 2011; Horner & Baer, 1978; Laureate Education, Inc., 2012; Rumrill

et al., 2011). In other words, I compared each of the participants' baseline phase to that participant's intervention phase.

I based the effects of a metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities on the rejection of the null hypothesis or acceptance of the alternative hypothesis. The null hypothesis could be rejected if the metacognitive reading strategy significantly affected the ERC skills of kindergarten students with intellectual disabilities. The null hypothesis could be accepted if the metacognitive reading strategy did not significantly affect the ERC skills of kindergarten students with intellectual disabilities.

It was beneficial to implement the utility of the intervention in this study. Because the limited cognitive abilities of students with intellectual disabilities interfere with their reading comprehension process, it was necessary to modify the metacognitive reading strategy by reading aloud, adapting text, and using pictures to provide students with reading comprehension support (Bilgi & Ozmen, 2014; Hudson & Browder, 2014; Hudson et al., 2013; Shurr & Taber-Doughty, 2012; Wood, Browder, & Flynn, 2015). Therefore, the intervention was implemented by (a) matching pictures to support the text; (b) reading the text, questions, and choice of answers aloud to the participants; (c) presenting the questions purposefully throughout the text; (d) developing questions based on three story elements; and (e) ensuring that the text and questions were the same for all participants.

Definitions

Emerging reading comprehension (ERC): ERC is defined as students acquiring knowledge about comprehension through experiences with literature prior to traditional literacy instruction (McNaughton, 2014; Rohde, 2015).

Metacognitive reading strategy: A planned questioning technique used to increase ERC skills (Yang, 2011).

Assumptions

An assumption in this study was that the participants were adequately and accurately identified as being intellectually disabled according to federal and state guidelines to support the validity of the study. Another assumption was that the assessment of the metacognitive reading strategy (intervention) was conducted with fidelity to ensure that the metacognitive reading strategy was conducted with a specific purpose consistently.

Scope and Delimitations

Scope

The scope of this study was defined by the focus on ERC and a metacognitive reading strategy implemented with kindergarten students with intellectual disabilities. In addition, the scope of the study was determined by students' attendance of a nonprofit private school, located in a major metropolitan area in the southeastern region of the United States.

Delimitations

The problem that I chose to address was low reading comprehension abilities in students with intellectual disabilities (Biligi & Ozmen, 2014; Conner et al., 2014; Reichenberg, 2014). I used convenience sampling to select the participants for this study. A single-participant multiple baseline design was used to determine the effects of a metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities.

Generalization. This study has generalization limitations. The results of this study can only be generalized to situations that involved using a metacognitive reading strategy to increase the ERC skills of some kindergarten students with intellectual disabilities. Further, the outcomes of this study can be only generalized to the metacognitive reading strategy with regard to questioning while reading to kindergarten students with intellectual disabilities. In addition, the results of this study can only be generalized to situations that involved purposefully placing questions throughout a passage while reading to kindergarten students with intellectual disabilities. The methodology of this study can only be generalized to determine the effects of a metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities.

Limitations

This study was limited to four participants, all whom were kindergarten students. Furthermore, the study focused on participants with intellectual disabilities. Additional limitations of this study were associated with its site, which was a nonprofit private

school in a major metropolitan area. A limitation of single-participant designs is weak external validity. In other words, the results of this study cannot be easily generalized to the entire population of kindergarten students with intellectual disabilities.

Researcher Bias

There is potential researcher bias in all studies. I took steps to control for researcher bias. I avoided researcher bias by not being a supervisor or employee at the research study site. In addition, I made every attempt to remain objective in data collection and analysis. I employed a fidelity check to ensure accurate intervention implementation and proper data collection.

Significance

This research study adds to the body of literature on special education practice. This study may help special educators provide more effective reading instructional practices for kindergarten students with intellectual disabilities. This study was unique because it addressed an academic area that has been under researched in relation to kindergarten students with intellectual disabilities (National Center on Educational Outcomes, 2014). Moreover, I anticipate that the metacognitive reading strategy explored in this study was effective in increasing the ERC skills of kindergarten students with intellectual disabilities, it would represent a contribution to the bank of special education reading strategies deemed effective for kindergarten students with intellectual disabilities. The study's implications for positive social change involve its potential to transform the way in which special education teachers think about increasing the ERC skills of kindergarten students with intellectual disabilities by

informing them about a metacognitive reading strategy that has positively impacted the future reading comprehension achievement outcomes of kindergarten students with intellectual disabilities.

Summary

The emphasis of this study was ERC. The participants were kindergarten students with intellectual disabilities. The purpose of this study was to investigate the effects of a metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities. The significance of this study resided in an effort to not only to fill a gap in ERC special education instructional practices, but also add to the ERC special education literature. I sought to answer the research question in this study by implementing a multiple baseline design across participants. The theoretical framework for this study was constructivism. It assumed that the participants' classification, according to state and federal guidelines, were intellectually disabled.

In Chapter 2, I presented a review of literature on metacognitive strategies, instructional strategies, and the implementation of technology to increase ERC abilities. Additionally, the review of literature addresses how deficits in cognitive functions and lack of ERC exposure impede the development of ERC skills in students with intellectual disabilities. Furthermore, the review of literature addresses how to measure the ERC learning performances of students with intellectual disabilities.

Chapter 2: Literature Review

A problem exists involving the low ERC skills of students with intellectual disabilities (Biligi & Ozmen, 2014; Conner et al., 2014; Reichenberg, 2014). The weak ERC skills of students with intellectual disabilities may be due to poor ERC experiences and deficits in working memory (Conner, Alberto, Compton, & O' Conner, 2014; Rohde, 2015). Many metacognitive reading comprehension strategies have been used in efforts to improve the ERC skills of students with intellectual disabilities (Damber, 2015; Sandvik et al., 2013). The purpose of this study was to investigate the effects of a metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities. In this literature review, I address the literature search strategies I used, elaborate on the study's theoretical foundation, present a literature review relevant to the study's key variables, provide a summary, and end with a conclusion.

Literature Search Strategy

The library databases that I used for this literature review were Education Complete, ERIC, Science Direct, Google Scholar, and Sage. The key terms and combinations of search terms that I used were *reading comprehension and students with intellectual disabilities, the gap in special education practices, emergent literacy, emergent reading comprehension, working memory, oral language, constructivist theory, and students with intellectual disabilities*. The scope of the literature review encompasses evidence-based, peer-reviewed articles published within the previous 5 years. I also included some articles published earlier than 2012 because those articles

were relevant to my study. The literature review also included government-issued reading comprehension guides published within the previous 5 years.

Theoretical Foundation

The theoretical foundation for this study was constructivism. The origins of the theoretical foundation were based on Vygotsky's and Piaget's constructivist theory. I chose this theory because it impacts instructional practices, learning strategies, and educational evidence-based exploration (Doolittle, 2014; Sharma, 2014). Proponents of constructivism perceive learners as actively engaging with their learning environment to construct new concepts (Doolittle, 2014; Sharma, 2014; Yoder, 2014). It is through the engagement process that the learner not only learns new ideas, but also builds on previous ideas to develop new concepts (Doolittle, 2014; Sharma, 2014; Yoder, 2014). The idea-constructing process happens not instantaneously but gradually (Doolittle, 2014; Sharma, 2014; Yoder, 2014).

Piaget's *schema* concept can be defined as a cognitive, systematic learning process (McLeod, 2015) that involves building blocks of intellectual behavior. The building blocks, or schema, of intellectual behavior are described as units of knowledge. A cognitive, systematic learning process and new experiences facilitate the learning of new concepts by organizing schema. Units of knowledge are systematically organized by assimilation, accommodation, and equilibration. In other words, when humans encounter an experience, they use the knowledge from a previous experience to determine how they will respond to new or repeated experiences. Moreover, the process of experiencing new and different situations makes schemas more complex. Therefore, the more learning

experiences humans have, the more complex their schema becomes, and the more prior knowledge they will have to support their responses to new or repeated experiences.

Theories that I excluded from my study were the theory of automatic information processing and bottom-up theory. The theory of automatic information processing, which is associated with automatic word recognition (Schrauben, 2010), did not apply to my study because the focus of this theory is the development of reading fluency. Bottom-up theory is related to using a systematic, phonics-based reading approach (Lui, 2010). Bottom-up theory did not apply to my study because it emphasized teaching students to independently read words through a traditional, systematic phonetic classroom approach to understand the meaning of the text. This traditional systematic classroom approach consisted of the student independently (a) associating letter to sound; (b) using the letter-to-sound association to read words independently; and (c) reading the words in the text (independently) for textual meaning.

Broek et al. (2011) investigated similar questioning techniques to compare the effects of questioning during reading to those of questioning after reading on ERC skills for students aged 2-9 years. Students were better able to recall information when questions were asked while the researcher was reading the presented text based on the results of the study (Broek et al., 2011). Likewise, Beecher and Childre (2012) used a metacognitive strategy to increase the ERC skills of students with intellectual disabilities aged 7-9 years. Qanwal and Karim (2014) discussed employing a metacognitive strategy during reading to increase the reading comprehension skills of students with intellectual disabilities.

Broek et al. (2011), Beecher and Chidre (2012), and Qanwal and Karim (2014) helped to illustrate how constructivist theory applications were used in reading interventions. The participants actively and gradually comprehended a story by listening to the text and answering purposefully placed questions throughout the text. The researchers used a scaffolding method by placing intended questions throughout the text to support the students with combining previous knowledge with new knowledge for textual comprehension. The researchers guided the participants to construct textual meaning.

Similar to the works of Broek et al. (2011) and Beecher and Childre (2012), I implemented a metacognitive reading strategy to determine whether it affected the ERC skills of kindergarten students with intellectual disabilities. Also, similar to Hudson and Browder (2014), I incorporated response pictures (associated with words to match the pictures). Furthermore, similar to these studies, I implemented a quantitative methodology.

Constructivist theory supported my research study because it provided a systematic cognitive learning process related to a scaffolding instructional approach. Constructivist theory aligns with the current study because the study used a single-participant multiple baseline design and a scaffolding instructional strategy to determine whether the use of a potentially successful metacognitive reading strategy (independent variable) affected the ERC skills of kindergarten students with intellectual disabilities (dependent variable). The application of a scaffolding method was implemented by purposefully placing questions throughout the story for the participants to comprehend

the presented text. Kindergarten students with intellectual disabilities actively engaged in the learning process by not only listening to the story, but also answering the questions.

The research question related to constructivist theory because it sought to determine whether the use of an evidence-based metacognitive reading strategy could impact instructional and learning ERC practices for kindergarten students with intellectual disabilities.

Literature Review Related to Key Concepts and Variable

Working Memory

Memory deficits are a roadblock to the advancement of reading comprehension performance in students with intellectual disabilities. Conner et al. (2014) and Biligi and Ozmen (2014) both addressed common cognitive reading comprehension executive functions. Their works are similar to those of Molen et al. (2013), Danielsson et al. (2012), and Trezise et al. (2014) with regard to explaining how deficits in working memory, inhibition, short-term memory, and updating can impede the emergent reading comprehension process for students with intellectual disabilities. However, Danielsson et al., Molen et al., and Trezise et al. conducted quantitative studies, whereas Biligi and Ozmen conducted a qualitative study and Conner et al., conducted a systematic review. Biligi and Ozmen indicated that students with intellectual disabilities have difficulty with reading comprehension because of their inability (a) to combine prior knowledge with new knowledge; (b) to categorize and systemize knowledge; and (c) to correlate concepts.

The study by Conner et al. (2014) study was similar to that of Biligi and Ozmen (2014) with regard to weak working memory. Conner et al. explained that weak working memory caused students with intellectual disabilities to exhibit problems with reading comprehension. Conner et al. explained that the students with intellectual disabilities had difficulty with reading comprehension due to the cognitive deficits related to working memory, inhibition memory, short-term memory, and updating memory.

The Molen et al. (2013) and Conner et al. (2014) studies were similar in that they investigated how deficits in short-term memory can affect the learning performances of students with intellectual disabilities. Molen et al. conducted a study to investigate the working memory progression of students with intellectual disabilities as compared to typically developing students. Based on the results of the study, Molen et al. concluded that short-term memory stopped developing around 15 years of age in typically developing children. In contrast, verbal short-term memory stopped developing around ten years of age for students with intellectual disabilities.

Danielsson et al. (2012) and Trezise et al. (2014) compared the performance task results of students with intellectual disabilities with those of students with similar mental abilities. In the Danielsson et al. study, students with intellectual disabilities performed below their mental age in regard to inhibition, planning, and nonverbal executive overloaded working memory as compared to students matched with them based on their mental age. The students performed below their chronological age on all executive tasks as compared to the group of students with the same chronological age. In the Trezise et al. study, students with intellectual disabilities performed worse when presented with a

working memory task than students with nonspecific intellectual disabilities. Therefore, deficits in cognitive processes have an impact on the reading comprehension performances of students with intellectual disabilities. Despite the fact that deficits in working memory affect the reading comprehension skills of students with intellectual disabilities, evidence-based approaches can be implemented to support the reading comprehension learning needs of students with intellectual disabilities.

Oral Language and Reading Comprehension

Parkin (2016) and Ricketts, Jones, Happe, and Charman (2013) both explored the effects of oral language on the reading comprehension skills of participants with intellectual disabilities. Parkin investigated the effects of oral language and word reading measures on reading comprehension performance. Like Ricketts et al., Parkin employed an oral language subtest. The participants consisted of students referred for special education services (including students with intellectual disabilities). The oral language and word reading subtest of Wechsler's Individual Achievement Test, Third Edition (WIAT-III) was used to determine whether it affected the reading comprehension skills of the participants. The data were analyzed using *R*. Additionally, path analysis was used to evaluate the data. Parkin's results indicated that oral language and word reading measures had an approaching to a mild effect on the reading comprehension abilities of the participants referred for special education services.

Ricketts et al. (2013) examined the effects of oral language, word recognition, and social impairments on the reading comprehension performances of participants with intellectual disabilities. Unlike Parkin (2016), Ricketts et al. investigated word

recognition and social impairment in relation to the reading comprehension performances of participants with intellectual disabilities. The Wechsler Objective Reading Dimensions (WORD) tool was employed to evaluate the word recognition and reading comprehension of the participants with intellectual disabilities. Unlike Parkin, Ricketts determined the receptive language scores of the participants with intellectual disabilities using the Test for Reception of Grammar (TROG-E). Also, unlike Parkin, Ricketts et al. implemented The Autism Diagnostic Scheduled-Generic (ADOS-G) to determine the social and communicative behavior of the participants with intellectual disabilities. The results of the Ricketts et al. study indicated that oral language, word recognition, and social impairments impacted the reading comprehension abilities of students with intellectual disabilities. Both researchers used assessments developed by Wechsler (Parkin, 2016; Ricketts et al., 2013). Additionally, both Parkin and Ricketts et al. revealed that oral language was a common factor that impacted the reading comprehension skills of students with intellectual disabilities.

Measuring the Reading Comprehension Learning Performances of Students With Intellectual Disabilities

Hill and Lemons (2015), Lemons et al. (2013), and Hosp, Hensley, Huddle, and Ford (2014) have common ways to determine the learning performances of students with intellectual disabilities. Their works are similar to those of Kalkan and Ozmen (2013); Wingerden, Segers, Bakom, and Verhoeven (2014); and Wingerden, Seger, Balkom, and Verhoven (2017) with regard to measuring the reading comprehension learning

performances of students with intellectual disabilities. A quantitative methodology was employed in these studies.

Hill and Lemons (2015) explained that educators implemented a curriculum-based measure (CBM) in the classroom to show the literacy skill performance of students aged 9-15 years with intellectual disabilities. The results of the study showed that the CBM was able to improve the academic literacy growth of students with intellectual disabilities. Furthermore, the results revealed significant negative measures between the performance of word reading fluency and early reading skills. Moreover, the study's outcomes indicated a significant relationship between the performance of passage reading fluency and late reading skills. Likewise, Lemons et al. (2013) implemented CBM to measure the learning performances of students with intellectual disabilities. Lemons et al. showed that a leveled system of early-grade reading CBM was used to represent alternate assessments based on alternate academic achievement standards (AA-AAS). The results of the Lemons et al. study indicated not only that within each disability category there was a positive relationship between grade levels and the students meeting the benchmark criteria, but also there was a significant difference between the different disabilities and reading scores.

Similar to Hill and Lemons (2015) and Lemons et al. (2013), Hosp et al. (2014) explored CBM to support the reading performance of students with intellectual disabilities. Hosp et al. used descriptive statistics and bivariate correlations to analyze data. However, unlike Hill and Lemons and Lemons et al., Hosp et al. conducted a study to determine the criterion validity of CBM by comparing it to the passage comprehension

test within the Woodcock-Johnson Tests of Achievement, Third Edition (WJIII). The performances of students with intellectual disabilities were compared on the Maze CBM and the WJIII Passage Comprehension test. The results of the Hosp et al. study indicated that there was no significant difference between the students' results on the Maze CBM versus the WJIII Passage Comprehension test. Therefore, it can be concluded that use of the Maze CBM is a valid means to establish the reading performances of students with intellectual disabilities.

Kalkan and Ozmen (2013), Wingerden et al. (2014), and Wingerden et al. (2017) used quantitative methodology to compare the reading performances of students with intellectual disabilities to those of their peers. Kalkan and Ozmen compared reading comprehension, reading rate, and error performances of fifth and eighth grade students with intellectual disabilities in self-contained special education classrooms to those of students with intellectual disabilities in inclusive classrooms. Their results indicated that there was no significant difference between fifth-grade students with intellectual disabilities in self-contained classes and fifth-grade students with intellectual disabilities in inclusive classes in the areas of reading comprehension, reading rate, and error performance. Likewise, there was not a statistical difference between eighth-grade students with intellectual disabilities in a self-contained classroom and eighth-grade students with intellectual disabilities in an inclusive classroom in literal reading comprehension and reading rate scores based on the results of this study.

Like Kalkan and Ozman (2013), Wingerden et al. (2014) compared the lower level (explicit) and higher level (implicit) reading comprehension abilities of students

with intellectual disabilities to those of students without disabilities. Further, Wingerden et al. investigated the contribution of linguistic and cognitive skills to the reading comprehension skills of students with intellectual disabilities. The children with intellectual disabilities between 9 and 12 years of age, whereas the children without disabilities were aged 6 to 7 years. The results of this study indicated that children with intellectual disabilities scored lower than the students without disabilities in the areas of language comprehension, nonverbal reasoning, and higher-level reading comprehension. Likewise, children within the intellectual disability group demonstrated significantly weaker performance on higher level reading comprehension than on lower reading comprehension based. In contrast, children who did not have a disability scored equally on higher level reading comprehension and lower reading comprehension. Moreover, Wingerden et al. revealed that lower level explicit reading comprehension abilities are related to word decoding and nonverbal reasoning. Additionally, lower level explicit reading comprehension abilities are substantially related to language comprehension. Variances of lower level explicit reading comprehension abilities and higher level implicit reading level abilities were related to nonverbal reasoning. Linguistic predictors did not result in a significant increase of variance explanation for higher level reading comprehension.

Similar to those of Kalkan and Ozmen (2013) and Wingerden et al. (2014), Wingerden et al. (2017) compared the reading comprehension scores of children with intellectual disabilities to typically developing children (control group). Furthermore, Wingerden et al. examined the linguistic and cognitive elements associated with the

reading comprehension skills of students with intellectual disabilities and typically developing students. In this study, the children with intellectual disabilities and the typically developing children obtained the same number of reading comprehension instruction. The results of Wingerden et al. study indicated that the children with intellectual disabilities scored lower than typically developing children on all measures. In this study, two path analyses were conducted to determine the linguistic and cognitive predictors related to reading comprehension of children with intellectual disabilities and typically developing children. The reading comprehension predictors of typically developing children were decoding, listening comprehension, vocabulary, and nonverbal reasoning based on the results of this study. Also, the results of Wingerden et al. noted that the reading comprehension predictors of children with intellectual disabilities were temporal processing, early literacy skills, decoding, and listening comprehension.

Metacognitive Reading Strategies, Instructional Strategies, and Reading

Comprehension for Students With Intellectual Disabilities

Metacognitive strategies, modifying text and reading text aloud can be beneficial to increasing the reading comprehension skills of students with intellectual disabilities. Browder et al. (2013) and Hudson et al. (2013) both modified the text to support increasing the reading comprehension skills of students with intellectual disabilities. Their works were comparable to Farjardo, Tavares, Avila, and Ferrer (2013), Farjardo et al. (2014), and Root, Knight, and Mims' (2016) studies with regards to modifying text. Browder et al., Farjardo et al., and Fajardo implemented a quantitative methodology approach. Hudson et al. and Root et al. used a systematic review approach. Browder et

al. utilized prompting, time delay, adapted chapters from a book, read-alouds, questions, and graphic organizers to increase the reading comprehension skills of students with intellectual disabilities in grades six through eight. The results of Browder et al. study were the implementation of reading adapted books aloud, providing students with the correct unknown word (after 4 seconds), and reading the questions aloud to increase the reading comprehension of middle school students with intellectual disabilities. Fajardo et al. study implemented adapted easy-to-read text to increase the reading comprehension skills of students with intellectual disabilities from a vocational training program. Hudson et al. used read-aloud along with text adaptation, text augmentation, providing multiple text comprehension engagement- opportunities, prompting, and summarizing the text to provide grade level text access for students with intellectual disabilities. Root et al. explained that using adapted text can support the literacy learning needs of students with moderate to severe intellectual disabilities.

Unlike the other studies that explored text adaptation, Farjardo et al. (2013) investigated adapted text regarding connectivity and word frequency. Also, unlike the other studies, Roberts and Leko (2013) used adapted text in an analytical lesson to determine whether it had an impact on increasing functional and literacy skills of students with intellectual disabilities. Roberts and Leko used a multiple baseline design. Farjardo implemented a quantitative method. Farjardo et al. study explored text adaptation by determining not only how connectivity and word frequency effected text comprehension for individuals with intellectual disabilities, but also which text features (connectivity or word frequency) affected text comprehension for individuals with intellectual disabilities.

It was concluded from the results of the study that literal comprehension did not have a significant difference between adapted and non-adapted text. Also, the results of this study for experiment one shown that over all literal comprehension was significantly higher than inferential comprehension. Likewise, Roberts and Lekos explored the impact of functional and academic literacy skills of students with intellectual disabilities by implementing a task analytical lesson plan that incorporated adapted grade level text. There was an increase in the functional skills and literacy academic skills of students with intellectual disabilities based on the results of Robert and Lekos's study.

Beecher and Chidre (2012) and Qanwal and Karim (2014) both included questioning during reading to increase the reading comprehension skills of students with intellectual disabilities. Their works are similar to Biligi and Ozman (2014) and Wood, Browder, and Flynn (2015). Breecher and Childre and Hua et al. (2014) employed a quantitative methodology. Yet, Qanwal and Karim implemented a mixed design approach. Beecher and Childre employed questioning during reading, read-alouds, and pictures to increase the reading comprehension skills of students with intellectual disabilities ages 7-10 years. Qanwal and Karim's study is comparable to Beecher and Childre with regards to implementing a metacognitive reading strategy during reading to increase the reading comprehension skills of students with intellectual disabilities. Qanwal and Karim employed questioning during reading as a metacognitive strategy to increase reading comprehension skills. Likewise, Biligi and Ozman utilized a questioning metacognitive strategy to increase the reading comprehension skills of students with intellectual disabilities. Also, Wood et al. used questioning to improve the

reading comprehension skills of students with intellectual disabilities. However, Wood et al. implemented student-generated questions in order to determine not only whether questions generated by students with intellectual disabilities will increase their comprehension skills, but also to determine whether the skill can be generalized to a fifth-grade whole group instructional classroom. There was an increase in the number of questions generated and answered during the treatment phase based on the results of this study. Also, there was an increase in the number of questions generated and answered in the generalization probe phase based on the outcomes of this study.

Hudson and Browder (2014) and Roberts, Lekos, and Wilkerson (2013) both implemented peer tutoring to support increasing the reading comprehension skills of students with intellectual disabilities. Even though, Hudson and Browder applied a quantitative approach. Roberts et al. employed a systematic review to explore increasing the reading comprehension skills of students with intellectual disabilities. Hudson and Browder applied modifying a novel, using peer tutors to read an adapted story aloud to students with intellectual disabilities, asking questions aloud, and using a response board with pictures increased reading comprehension skills of students with intellectual disabilities ages 9-11 years. Also, Roberts et al. study was similar to Hudson and Browder's study with regard to implementing a peer intervention as a strategy that increased the ERC skills for students with intellectual disabilities. Roberts et al. conducted a literature review regarding literacy instruction for adolescents with intellectual disabilities. The coding results of the literature review indicated that the effective methods for teaching adolescent literacy are technology, observational learning,

community instruction, peer intervention, prompting, overcorrection of oral reading procedures, commercial reading intervention, combining functional and academic content, adapting literature, and embedding instruction.

Lundberg and Reichenberg (2013) and Reichenberg (2014) employed guided social interaction instruction to increase the reading comprehension skills of students with intellectual disabilities. Guided social instruction increased the reading comprehension skills of students with intellectual disabilities based on the results of this study. Lundberg and Reichenberg's study, the students with intellectual disabilities answered literal questions better than inferential questions. Just like Lundberg and Reichenberg, in Kalkan's and Ozmen's (2013) study a difference was shown regarding literal and inferential questions for students with intellectual disabilities. Both studies employed using a quantitative methodology.

Alnahdi (2015) and Mims, Hudson, and Browder (2012) both found that shared stories and systematic instruction were strategies that increased the reading comprehension skills of students with intellectual disabilities. Their works were similar to Browder, Lee, and Mims (2011) with regard to using shared stories and systematic instruction to increase the reading comprehension skills of students with intellectual disabilities. Roots et al. (2016) study was comparable to Alnahdi, Mims et al., and Browder et al. regarding using systematic instruction to increase the reading comprehension skills of students with intellectual disabilities. Mims et al. and Browder et al. implemented a quantitative methodology. Alnahdi and Root et al. employed a systematic review. Mims et al. implemented shared stories with systematic instruction,

and prompting to increase the reading comprehension skills of students classified with intellectual disabilities. Mims et al. and Alnahdi conducted a comprehensive literature review regarding strategies that can increase the reading comprehension skills of students with intellectual disabilities. These studies' results indicated that systematic, explicit, intense, and consistent instructional practices increased the reading comprehension skills of students with intellectual disabilities. Similar to Alnahdi and Mims et al., Browder et al. conducted a study combining shared stories, scripted systematic instruction with a task analysis approach to increase the reading comprehension skills of students with intellectual disabilities regarding assessing teacher infused shared stories with students with intellectual disabilities. All participants correctly responded to the comprehension steps used in the literacy lesson based on the results of this study. Likewise, Root et al. study indicated that systematic instruction can support increasing the reading comprehension skills of students with moderate to server intellectual disabilities.

Lemons, Allor, Otaiba, and Le Jeune (2016), Allor, Mathes, Roberts, Cheatham, Otaiba (2014), and Allor, Gifford, Otaiba, Miller, and Cheatham (2013) discussed that direct instruction increased students with intellectual disabilities reading skills. Lemons, et al. (2016) employed a systematic review. Allor, Mathes et al. and Allor, Gifford et al. implemented a multiple baseline across participants. Lemons et al. explained that explicit instruction, direct instruction, scaffolding strategy, systematic instruction, progress monitoring, access to age appropriate literature, generalizing reading strategies across different types of literature, including parents and service providers in the Individual Educational Planning process will assist with increasing reading comprehension of

students with intellectual disabilities. Likewise, Allor, Mathes et al. investigated implementing direct evidence-based instruction on the reading learning performances of students with intellectual disabilities. The results of the study were the comprehensive evidenced-based intervention was effective for the students with IQ that measured between 40-80. Also, the outcomes of the study were the students' IQ measures significantly impacted the students' response to the instruction regarding vocabulary, phonemic decoding, word recognition, oral reading fluency (ORF). However, the IQ scores did not have a significant impact on the response regarding phonological processing measures. Additionally, there were significant differences in reading comprehension, but not for listening comprehension based on the outcomes of this study. Also, Allor, Gifford et al. implemented direct instruction with text and text based lessons to increase the reading abilities of students with intellectual disabilities.

Ruppar (2015) and Shurr and Taber-Doughty (2012) both included pictures to increase the reading comprehension skills of students with intellectual disabilities. Their works were comparable to Shurr and Taber-Doughty (2016) with regards to utilizing pictures. Shurr and Taber-Doughty (2012) and Shurr and Taber-Doughty (2016) applied a quantitative method. However, Ruppar conducted a systematic review. The results of Ruppar's study indicated that the materials mostly used were picture symbols and worksheets. Therefore, asking students questions related to the passages read, reading the passage aloud, using graphic organizers, using a time delay, and adapting the text can assist increasing the reading comprehension skills of students with intellectual disabilities. Shurr and Taber-Doughty (2016) used pictures to increase the reading

comprehension skills of students with intellectual disabilities. Shurr's and Taber-Doughty's (2012) utilized pictures to increase the reading comprehension skills of middle school students with intellectual disabilities. Shurr and Taber-Doughty (2016) utilized a picture plus discussion (PPD) intervention on the reading comprehension skills of high school students with intellectual disabilities. The PPD intervention improved the reading comprehension skills of students with intellectual disabilities based on the results of this study.

Metacognitive Reading Strategies and Instructional Strategies to Support Increasing Comprehension of Expository Text for Students With Intellectual Disabilities

The implementation of metacognitive reading comprehension and instructional strategies can be beneficial in increasing an individual's comprehension of expository text. Hudson, Browder, and Jimenez (2014) conducted a study that used fourth-grade nondisabled students as peer tutors to not only read aloud an adapted science text, but also provide a peer-delivered system to fourth-grade students with intellectual disabilities for correct responses. The results of this study determined that a functional relationship exists between a peer-delivered of 'least prompts system' and correct listening comprehension responses. Likewise, Knight, Spooner, Browder, Smith, and Wood (2013), conducted a study regarding whether the use of graphic organizers and systematic instruction not only assisted students with disabilities with learning science ideas, but also assisted students with disabilities generalizing science ideas. The results of Knight et al. (2013) study showed that graphic organizers and systematic instruction had a positive

impact on assisting students with intellectual disabilities not only to learn basic science concepts, but to generalize their concepts. All of these studies employed using a quantitative approach.

In addition, Ozmen (2011) and Knight et al. (2013) both incorporated graphic organizers to support expository text comprehension for students with intellectual disabilities. Also, both studies utilized a quantitative methodology. Ozmen utilized graphic organizers to assist students with intellectual disabilities ages 11-14 years, to recall information from an expository text. An alternate treatment design was implemented. The data were evaluated using data trend and a data path level. Likewise, Zakas, Browder, Ahlgrim-Delzell, and Heafner (2013) implemented graphic organizers to increase the reading comprehension skills of students with intellectual disabilities. The purpose of Zakas et al. (2013) study was to use a modified graphic organizer to support increasing the understanding of expository text for middle school students classified with autism. The modified graphic organizer assisted the participants with answering the questions about the expository text based on the results of this study.

Unlike the other studies that explored increasing expository text comprehension in this section of this literature review. Hua et al. (2014) implemented paraphrasing and Swanson, Wanzek, Vaughn, Roberts, and Fall (2015) implemented Promoting Acceleration of Comprehension and Content Through Text (PACT) intervention. Hua et al. used paraphrasing to increase the expository text comprehension for students with intellectual disabilities. There were no significant differences between the two groups based on the results of this study. In addition, the results of the posttest indicated that

there was a significant difference between the two groups. Swanson et al. also used PACT, but to increase social studies reading comprehension skill of students with disabilities. The results of Swanson et al. study established a significant social study reading comprehension difference between the pretest and posttest for the participant that used PACT intervention. Both studies used a quantitative approach.

Metacognitive Reading Strategies, Instructional Reading Strategies, and Technology for Students With Intellectual Disabilities

Douglas, Ayres, Langone, and Bramlett (2011) and Evmenova, Behrmann, Mastropieri, Baker, and Graff (2011) both used pictures with technology to produce favorable results with increasing the reading comprehension skills of students with intellectual disabilities. Their works are similar to Glenberg, Goldberg, and Zhu (2011) and Evmenova, Graff, and Behrmann (2015) with regard to using pictures, words, and technology. These studies used a quantitative method. Douglas et al. conducted a study using graphic organizers with pictures to help students with intellectual disabilities to comprehend recipes that were presented on a computer. The assistance of pictorial graphic organizers, middle school students with intellectual disabilities were able to comprehend the recipe shown on the computer based on the results of this study. Hence, using technology with metacognitive strategies is a useful tool for increasing the reading comprehension skills of students with intellectual disabilities. Thus, Evmenova, Behrmann et al. work was similar to Douglas et al. study. Both studies utilized the impact of pictures with technology on the reading comprehension skills of students with intellectual disabilities. Along with the pictures, Evmenova, Behrmann et al.

incorporated alternate commentary, colored emphasized text, picture/word based titles, and collaborative video probing components. The results of Evmenova, Behrmann et al. study showed that pictures along with technology had a positive impact of increasing the reading comprehension of students with intellectual disabilities.

Evmenova et al. (2011) and Glenberg et al. (2011) both visually associated the meaning of words or phrases, on a computer monitor, with students' literacy experiences increased their emergent reading comprehension skills. Similar to Evmenova et al. study, Evmenova et al. (2015) incorporated videos to increase the reading comprehension skills of students with intellectual disabilities. The expository comprehension of the students with intellectual disabilities increased after being exposed to picture/word captions and interactive video features based on the results of this study.

Parette, Hourcade, and Blum (2011) and Rivera (2013) both used a power point presentation to improve the reading comprehension skills of students with intellectual disabilities. Both studies were implemented using a systematic review. Rivera suggested that using multimedia can be beneficial to increase the ERC skills of culturally and linguistically diverse (CLD) students with intellectual disabilities. Parette et al. used a Microsoft PowerPoint program to support the literacy skills of students with developmental disabilities. The researchers of both studies explained that an interactive presentation features of the PowerPoint program would increase the learning engagement of the students with developmental delays. Also, both researchers expounded that the PowerPoint program will make it easier for educators to create and implement a systematic instructional lesson.

Schryer et al. (2015) and Spooner, Kempt-Inmann, Ahlgrim-Delzell, Wood, and Davis (2015) both combined shared reading with technology to increase the reading comprehension skills of students with intellectual disabilities. Their studies were comparable to Cumming, Strnadova, and Singh (2014), Coyne, Pisha, Dalton, Zeph, and Smith (2012), and Coyne, Evens, and Karger (2017) concerning using technology to support literacy performances of students with intellectual disabilities. Coyne, Evens et al. implemented a quantitative methodology approach. The goal of Schryer et al. study was to combine interactive shared reading with educational programming to increase emerging reading comprehension skills. The students in the treatment group scored higher on standardized emergent literacy measures than students in the control group based on the results of this study. Schryer et al. employed a quasi-experimental pretest and posttest design. Spooner et al. conducted a study using an IPAD 2 (containing a shared story) and systematic instruction to increase the reading process and generalization of emergent literacy skills of students, ages 7-11 years, with severe disabilities. An IPAD, with a shared story, and systematic instruction increased the reading acquisition and the generalization of emergent literacy skills of students, ages of 7 -11, with severe disabilities based on the outcomes of this study. Spooner et al. implemented a multiple probe design across participants. Just like Spooner et al. Cumming et al. used IPADs to determine whether it would assist with increasing students with intellectual disabilities literacy skills. The results of the Cumming et al. study indicated that using IPADs with instruction assisted students with intellectual disabilities to increase their abilities in literacy. Cummings et al. used an inductive content analysis

methodology approach. Furthermore, Coyne, Pisha et al. implemented an e-book scaffolding approach to increase the reading comprehension skills for students with intellectual disabilities. Coyne, Pisha et al. implemented Literacy by Design (LBD) to increase the reading comprehension skills of students with intellectual disabilities in kindergarten, first grade, and second grade. There was more reading comprehension growth for the participants that were exposed to the LBD than for the participants that were only exposed to the traditional literacy strategy based on the results in this study. Therefore, LBD supported increasing the reading comprehension skills of students with intellectual disabilities. Likewise, Coyne, Evens et al. implemented a Udio, an UDL computerized literacy environment, program with students with intellectual disabilities. The goal of this study was to determine the accessibility and worth of the Udio with supporting the literacy performances of students with intellectual disabilities. The results of Coyne, Evens et al. study indicated that the Uido was an assessable and valuable program for supporting the literacy performances of students with intellectual disabilities.

Similar to Spooner et al. (2015) and Cumming et al. (2014), Gunderson, Higgins, Morgan, Tandy, and Brown (2017) explored using an IPAD to determine whether it impacted the learning performances of students with intellectual disabilities. In addition, like Coyne et al. (2012), Knight, Creech-Galloway, Carl and Collins (2017) examined using electronic text (e-Text) to establish whether it would affect comprehension skills of students with intellectual disabilities. Unlike Spooner et al. (2017), Cumming et al. and Coyne et al., Gunderson et al. and Knight et al. explored using technology with metacognitive reading strategies to support expository text comprehension. Gunderson et

al. conducted a study to determine the effects of an IPAD on students with intellectual disabilities' learning performances, worksheet completion, and student engagement concerning social studies. Also, this study examined students' perceptions about using an IPAD. In this study, the participants were divided into a group that used an IPAD and a group that used traditional classroom instruction. The results of Gunderson et al. study showed that there was no significant learning performance difference between the group that used an IPAD and the group that used traditional teaching methods when employing a metacognitive strategy regarding the social studies content knowledge area. Also, the results of Gunderson et al. study found that in the primary grades there was no significant difference between digital worksheet completion and paper worksheet completion following IPAD instructional intervention. However, in the intermediate and secondary grades between digital worksheet completion was higher than paper worksheet completions after IPAD instructional intervention. Besides, Gunderson et al. study revealed that student engagement was greater following IPAD instructional intervention as compared to traditional instruction. Likewise, the results of Gunderson et al. study indicated that students exposed to IPAD instructional intervention favored using the IPAD. Gunderson et al. employed a quantitative methodology approach. Knight et al. conducted a study to determine the impact of e-Text with explicit instruction on the comprehension skills of students with intellectual disabilities involving science content knowledge. The results of Knight et al. study showed that implementing E –Text and explicit instruction heighten the number of correct science content knowledge responses to the presented science questions. Knight employed a multiple baseline probe design.

Home Literacy Environment and Emergent Literacy

The emerging reading comprehension experience can be beneficial in increasing the reading comprehension skills of children with intellectual disabilities. Edwards (2014) and Kurcirkova et al. (2012) both addressed the common components of the home literacy environment. Their works are similar to Ricci (2011) and Rohde (2015) regarding a thick rich home literacy environment supports the development of emergent literacy abilities of all children. Edwards, Ricci, and Kurcirkova et al. implemented a mix design. Rohde implemented a systematic review. Kurcirkova et al. indicated that shared reading between mothers and toddlers, with equal engagement, increases ERC skills and linguistic skills. Parents and toddlers were more engaged with personalized books than with non-personalized books based on the results of this study. In addition, the parent and child mutual engagement with personalized books results indicated that toddlers smiled when looking at the personalized book and parents smiled when they saw their toddler enjoying the personalized book.

Just like Kurcirkova et al. (2012) study, Edwards' (2014) study showed shared read-alouds enhanced engagement between mothers and toddlers. Edwards conducted a study to determine the effects of the home literacy environment and read aloud shared by mothers and toddlers (ages 18-36 months) on the toddlers' emergent literacy skills. The results from the shared reading observational checklist indicated that the toddlers exhibited emergent literacy behaviors from the written language awareness domain. Also, the results of the home literacy environment questionnaires indicated that the families with high home literacy scores are in alignment with positive home literacy

environments. In Rohde's (2015) study the comprehensive emergent literacy model (CELM) supported emergent literacy by not only recognizing that each developmental feature has its individual process, but also that each developmental feature supports one another. Also, CELM acknowledges that it is important to understand that the students' literacy environment has an effect on their emergent literacy experiences.

Rohde's (2015) study and Ricci's (2011) study both indicated that a high-level home literacy environment has a positive effect on emergent reading comprehension skills. Ricci compared the home literacy environments, interest in reading, and the emergent literacy skills of students with Down syndrome to typical developing students. There was no significant gender difference regarding home literacy environment, children's interest in reading, and emergent literacy outcomes within the entire group of subjects or the down syndrome group based on the results of this study. Also, parents of school-age children with down syndrome and parents of typical age children scored higher on the home language environment questionnaire than parents of preschool age children with down syndrome. In addition, the results of this study revealed that school-aged children with down syndrome scored better on some emergent literacy measures that mental-aged matched typical children. School-aged children with down syndrome and typically aged children exhibited greater interest in reading than preschool age children with down syndrome based on the results of this study. Therefore, school-age children with down syndrome, whose parents scored high on the home language questionnaire, emergent literacy skills measured higher than the typically match mental-aged children.

Emergent Literacy and Shared Read-Alouds

Schnorr (2011) and Wiseman (2011) both addressed common features of emergent literacy. Their work is similar to Goldstein (2011), Girolametto et al. (2013), Connor, Phillips, Kascheks, Apell, Kim, Otaibi, Crowe, Tate, Johnson, and Lonigan (2014), Browder, Ahlgrim-Delzell, Flowers and Baker (2012), Hudson and Test (2011), Afacan, Wilkerson, and Ruppard (2017), and Mucchetti (2013) with regard to implementing interactive shared read aloud, explicit instructional strategies, intensive instructional strategies, guided instruction, children engaging in shared reading, comprehension monitoring, and adapting text to support the child's learning needs. Schnorr, Hudson and Test, Goldstein, and Conner et al. employed a systematic review. Wiseman and Girolametto et al. used a mixed design. Browder et al. and Mucchetti implemented a quantitative method. Afacan et al. employed a qualitative method that consisted of two coding procedures. Schnorr explained that to increase students with developmental disabilities emergent literacy skills, the literacy instruction needs to be explicit, ongoing, incorporate meaningful participation, include effective reading instruction components, and always adjusted to the students' learning needs. Likewise, explicit teacher language is another main component structured shared reading. These strategies can include, but not limited to, modeling, feedback, guided instruction, making connections, emergent readers providing their ideas, emergent readers responding to the presented text, and taking the role as a skilled individual in the reading process. These techniques should be used throughout the entire text. Like Schnorr, Goldstein indicated that using explicit instruction supports increasing emerging literary skills.

Similar to Schnorr (2011), Wiseman (2011) showed that interactive read aloud assisted emergent kindergarten readers to construct meaning from a presented text by students interacting with peers about the text, students interacting with their teachers about the text, students responding to the text, and using the text to build on students' prior knowledge. Likewise, Girard et al. (2013) conducted a qualitative study to investigating not only "decontextualization" talk and literal talk as an emergent literacy method used in an early childhood classroom, but also the transference of the educators' emergent literacy strategies to the students' post story writing activities. Educators engaged students in literal and decontextualized talk based on the results of this study. Also, the students used cognitively challenging talk and literal talk about the shared story based on this study's outcome. Likewise, the students demonstrated low decontextualized and literal talk during the post- story writing activity based on this study's results. Goldstein (2011) explained students that take on an active role during shared reading will support not only language skills, but also meaning-focus skills.

Browder et al. (2012) and Connor et al. (2014) both used a literacy strategy consisting of multiple components to increase ERC skills of students with intellectual disabilities. Afacan (2017) investigated the impact of the components, results, and value in multicomponent reading interventions for students with intellectual disabilities. Connor et al. explained The CTT consist of eight literacy techniques to increase reading comprehension skills of students from prekindergarten to fourth grade as well as oral language comprehension methods. The CTT tool COMPASS increased reading comprehension, for emergent readers, through the use of comprehension monitoring and

narrative text structure. Besides, reading comprehension monitoring can be implemented, for emergent readers, through a listening comprehension approach. In addition, text structure knowledge assists with not only spoken language, but also reading comprehension. Furthermore, text structure knowledge supports reading comprehension and oral language through an oral metacognitive scaffolding approach. Browder et al. used a multicomponent literacy method can increase the ERC skills of students with intellectual disabilities. The group who used the multicomponent curriculum, scored higher than the group that used the sight word approach based on the results of this study. Afacan et al. concluded that multicomponent reading interventions positively impacted the literacy skills of students with intellectual disabilities.

Hudson and Test (2011), Goldstein (2011) and Mucchetti (2013) studies used read-alouds to supports the ERC skills of students with intellectual disabilities as well as adapting curriculum to support the ERC skills of students with intellectual disabilities. In Hudson and Test's study implementing shared stories (read aloud) to promoted literacy for students with intellectual disabilities. Also, Mucchetti's study explained that shared read-alouds with text adaptation has shown to increase students with intellectual disabilities story comprehension skills. The results of this study indicated that there was an increase in the participants' story comprehension and story engagement. Like Mucchetti, Goldstein suggested using shared reading as a strategy to support emergent literacy development and implementing adapting early literacy curriculums designed for students without disabilities showed an increase in the early literacy performances for students with intellectual disabilities.

Constant Time Delay

Browder, Root, Wood, and Allison (2015) and Saunders, Spooner, Browder, Wakeman and Lee (2013) both discussed that combining constant time delay with reading metacognitive strategies support increasing the reading learning performances of students with intellectual disabilities. Like Browder et al. and Saunders et al., Alison implemented constant time delay with reading metacognitive strategies to increase the reading comprehension skills of students with intellectual disabilities. Browder et al. combined constant time delay with story mapping, systematic instruction, and technology to increase the reading comprehension skills of students with intellectual disabilities. Likewise, Saunders et al. discussed implementing constant time delay with systematic instruction and technology supports increasing the literacy performance skills of students with intellectual disabilities. Unlike Browder et al. and Saunders et al., Alison et al. explored combining constant time delay with shared story intervention and technology to increase the reading comprehension performance of English Language Learners (ELL) with intellectual disabilities. Browder et al. and Alison et al. used a multiple probe baseline design. Saunders et al. implemented a systematic review methodology.

Summary and Conclusions

Throughout this literature review, I discovered that the implementation of a metacognitive reading strategies and instructional reading strategies could increase the emerging literacy skills of students with intellectual disabilities. Cognitive deficits and a lack of experience with ERC skills can affect the reading comprehension skills of students with intellectual disabilities. However, many researchers have indicated that

implementing read-aloud experiences (using a person or technology) with metacognitive reading strategies and instructional reading strategies (direct instruction) can support increasing the ERC skills of students with intellectual disabilities. In turn, increasing the ERC skills of students with intellectual disabilities will support their future reading comprehension performance. Furthermore, educators used a CBM to support determining the literacy learning needs of students with intellectual disabilities by identifying their present level of performance and implementing evidence-based reading comprehension strategies to reach the next benchmark level. Many of the researchers used the same or a combination of the same metacognitive strategies when increasing the reading comprehension skills or the ERC skills of students with intellectual disabilities. Also, many of the researchers employed the same, or implemented a combination of the metacognitive reading comprehension strategies with participants of different age levels. Therefore, I can conclude that aligning the metacognitive reading comprehension strategies and the instructional reading comprehension strategies based on an individual's learning needs may support increasing their ERC skills.

These studies have addressed the use of metacognitive strategies for increasing the ERC skills of students with intellectual disabilities aged seven and older, but also addressed increasing the ERC skills of students without intellectual disabilities ages 2-9 years. However, applying the metacognitive reading strategies to improve the ERC skills of kindergarten students with intellectual disabilities were not addressed. Also, whether applying the metacognitive reading strategies to support increasing the ERC skills of kindergarten students with intellectual disabilities was not known. This present study

addressed the gap in the research about practices and extended knowledge in the discipline of special education by providing a potentially effective evidence-based practice to increase the ERC skills of kindergarten students with intellectual disabilities. A quantitative methodology will be discussed in Chapter 4 regarding using a metacognitive strategy to potentially increase the ERC skills of kindergarten students with intellectual disabilities.

Chapter 3: Research Method

The purpose of this study was to examine the effects of a metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities. The results of this study add to evidence-based literature on effective instructional practices for students with intellectual disabilities at the kindergarten level. Some metacognitive reading strategies can be described as planned questioning techniques to increase ERC skills (Yang, 2011). I employed a teacher-produced questioning technique based on the works of Broek et al. (2011). I used a single-participant multiple baseline design to evaluate the effectiveness of a metacognitive reading strategy in improving the ERC skills of kindergarten students with intellectual disabilities.

Setting

The site was a nonprofit private school in a major metropolitan area in the southeastern region of the United States. This school and related facility were established to provide enhanced services and education for students with various disabilities. The students who attended the school ranged in age from 3-8 years. I chose this site because the educators at this site provided special educational instruction to kindergarten students with intellectual disabilities. The research site enrolled kindergarten students with intellectual disabilities who would be 5 years of age by September 1 or had opted to have another year of prekindergarten, which made them 6 years of age in kindergarten. The research study was conducted in this site's classroom. The classroom was well lit, contained a table and chairs, and had a carpet on the floor.

Research Design and Rationale

The independent variable was a metacognitive reading strategy. The dependent variable was the ERC skills of kindergarten students with intellectual disabilities. The metacognitive reading strategy was categorical, and the ERC skills of kindergarten students with intellectual disabilities were continuous. I implemented a single-participant multiple baseline design across four participants. A single-participant design was used to determine the effect of the independent variable on the dependent variable (Byiers et al., 2012; Horner & Baer, 1978; Laureate Education, Inc., 2012; O'Neill et al., 2011; Rumrill et al., 2011). The single-participant design assisted me in answering the research question by identifying the effect of the metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities.

Design Choice

The design choice was consistent with research designs needed to advance knowledge in special education research for the following reasons:

- There is a need to address the gap in special education practices for students with intellectual disabilities by conducting a high-quality, evidence-based ERC single-participant design (Courtade et al., 2015).
- A multiple baseline design across participants can confirm, through systematic replication, that the intervention is responsible for the change in the dependent variable (Byiers et al., 2012; Horner & Baer, 1978; Laureate Education, Inc., 2012; O'Neill et al., 2011; Rumrill et al., 2011).

- A single-participant design is a leading methodology for investigating the impact of an intervention on students with intellectual disabilities (Courtade et al., 2015).

Defending the Choice of Intervention

I used a metacognitive reading strategy because it has been proven effective for students without disabilities between 2 and 9 years of age (Broek et al., 2011; Schnorr, 2011). Additionally, this metacognitive reading strategy has proven effective for older students with intellectual disabilities (Breecher & Childre, 2012). Therefore, I addressed the gap in special education ERC practices by implementing this metacognitive reading strategy for kindergarten students with intellectual disabilities.

Methodology

I implemented a single-participant multiple baseline design. I employed a metacognitive reading strategy as an intervention. The participants for this study consisted of four kindergarten students with intellectual disabilities. The selected participants were from a nonprofit private school, located in a major metropolitan area in the southeastern region of the United States. The sampling procedure was convenience sampling. I obtained permission to collect data by acquiring approval from the Institutional Review Board of Walden University. I obtained approval to conduct the study at a nonprofit private school located, in a major metropolitan area in the southeastern region of the United States. I collected data using a secondary analysis approach. I used the reading materials from the Unique Learning System (see Appendices A and B). I obtained permission to use and modify the behavioral observational

materials from Pearson (see Appendices A and C). In addition, I acquired permission to use the reading materials from N2Y (see Appendices A and B). I employed the improvement rate difference (IRD) as a statistical measure. I used visual graphical data analysis and an effect size statistic to show the difference between the baseline phase and assessment of a metacognitive strategy (intervention) phase.

Population Selection

The population of interest for this study was kindergarten students with intellectual disabilities in the research setting. The selected participants were from a group of kindergarten students with intellectual disabilities in a nonprofit private school located, in a major metropolitan setting in the southeastern region of the United States.

The sampling procedure was convenience sampling. The sample was drawn in the following manner:

1. I identified a site associated with kindergarten students with disabilities.
2. I identified the kindergarten students with intellectual disabilities.
3. From the participant pool, I randomly selected potential participants for the study.

The sample included kindergarten students with intellectual disabilities aged 4-6 years. These kindergarten students had already gone through special education eligibility testing and had received a diagnosis of intellectual disability. I did not include regular education students in the research study. Convenience sampling to select participants is a standard sampling strategy for a single-participant design (O'Neill et al., 2011). I chose four participants from a pool of kindergarten students with intellectual disabilities.

Procedures for Recruitment, Participation, and Data Collection

Obtaining institutional or organizational consent. I needed to obtain Institutional Review Board (IRB) consent from Walden University before I could collect data for my research study. I also obtained official proposal notification from the Office of Student Research Administration. After submitting an IRB application with materials associated with my study, I received approval from the IRB at Walden University. In addition, I consulted with the IRB regarding the population in my study and whether I needed to take any further steps after the data collection phase.

The research site was a nonprofit private school, located in a major metropolitan area in the southeastern region of the United States. I chose this site because the educators provided special education instruction to kindergarten students with intellectual disabilities. I obtained consent to conduct my study at this site by employing a four-step process. First, I contacted the supervisor of this site. Next, I provided the supervisor with my proposal. I then obtained clearance from the site as a volunteer. Finally, the gatekeeper at this site signed the Agreement for Program or Initiative Oversight and Data Use When the Researcher Has Dual Roles.

Data collection. I collected data using the secondary analysis approach. The data were collected under the auspices of the study's site. In my role as a volunteer, I collected data for the study site's internal program assessment and steady advancement. One fundamental purpose of using a secondary analysis was that Walden University cannot govern an intervention. Implementing the secondary analysis approach means that the data were the property of the selected nonprofit private school. Since the data were the

property of the nonprofit private school, I asked the director at the nonprofit private school, located in a major metropolitan area of the southeastern region of the United States to surrender the data to me for research purposes only. Secondary analysis was a suitable data collection approach because the primary reason for the data was to inform operations at the study site; the research study represented a secondary reason for data collection.

I debriefed the educators at the school about the study by providing them with a summary of the study. I explained the outcomes of the study to the educators at the school. I also answered any questions that the educators at the school asked about the study. I then provided a summary to the educators, which addressed the purpose of the study, the study's procedures, and the study's outcomes. Furthermore, I provided the participants with a small thank you gift (a choice of a preferred toy or sticker). I consulted with the IRB regarding the population in my study.

Intervention

The intervention was a metacognitive reading strategy. The intervention was part of an instructional strategy that educators at the site wished to implement. The stories used were from the Unique Learning System (see Appendices A and B). During the intervention phase, I read a portion of a story to the students, stopped reading, and asked the participants a question about what I had read. I collected data indicating the number of correct responses the participants provided. I continued the assessment of a metacognitive reading strategy across five sessions (Byiers et al., 2012). Each session was about 20 minutes in length. Pictures directly represented the read passage. I

provided the participants with three pictorial choices. The pictorial choices had words that described the pictures. The participants demonstrated the correct answer by choosing the correct picture-word choice in response to presented questions.

Instrumentation and Operationalization of Constructs

The reading materials to collect data in this study were derived from the Unique Learning System (N2Y, 2016; Unique Learning Systems, 2008; Appendix A & Appendix B). N2Y, a prominent developer of special education programs and special education resources, developed the Unique Learning System. The Unique Learning System was developed to provide general education curriculum access to students with disabilities. This system supports the learning needs of students with disabilities by providing differentiated instruction and adapted materials. Furthermore, the Unique Learning System's curriculum is aligned with state standards. I contacted a representative from N2Y, and I obtained a letter permitting me to use their materials in my study. (See Appendices A and B.)

I used a frequency chart to document the correct reading responses for each participant. Behavioral observation forms have been successfully used with single-participant designs to document number of correct responses (O'Neill et al., 2011). I based my assessment of changes in participants' ERC skills on the number of correct responses when presented with purposefully placed questions throughout the selected Unique Learning Systems passages (see Appendices A and B). I obtained permission from Pearson to use and adapt the data collection form to collect data for my study (see Appendices A and C).

Data Analysis Plan

My analysis data plan followed the contemporary methods of single-participant designs and related data analysis (O'Neill et al., 2011). This method involved frequency measures of correct responses to comprehension questions before and during the assessment of a metacognitive reading strategy (intervention). I computed the effect size of the assessment of a metacognitive reading strategy to gain additional results on the metacognitive reading strategy. I analyzed the data in the following manner:

1. I identified the null and alternative hypotheses.
2. I collected baseline data and data for assessment of the use of a metacognitive reading strategy phase.
3. I compared the graphed results between the baseline phase and the assessment of the use of a metacognitive reading strategy phase (intervention) for all four participants.
4. I made a determination based on the graphed results about accepting or rejecting the null hypothesis (O'Neill et al., 2011).
5. I calculated size effect to indicate the magnitude of the effect of the independent variable on the dependent variable.

Data cleaning and screening procedures. Data cleaning and screening procedures ensured that all of the correct data were accurately tabulated and graphed (Creswell, 2012). I ensured that the correct data were placed on the graph by inspecting the graph to determine whether the collected data from the frequency charts matched the data points on the graph. I confirmed that the correct data were used when calculating

the effect size. I guaranteed that the data were aligned with the correct participants by using a binder with different sections. Each participant was assigned a section in the binder, and the participants' data were placed in different sections of the binder.

Statistical test. I used graphical data to illustrate the difference between the baseline phase and the assessment of a metacognitive reading strategy phase (intervention). To further show the potency of the assessment of a metacognitive reading strategy, I used the effect-size statistic to evaluate the magnitude of the intervention between the baseline and the intervention phases. I used the IRD formula to determine the effect size (Parker, Vannest, & Brown, 2009). This statistic is appropriate for the analysis of these types of data (Byiers et al., 2012). The IRD statistical analysis (a) offers a visual analysis; (b) gives an improvement rate difference explanation for the baseline versus the assessment of the metacognitive reading strategy phases; (c) employs easy hand computation; (d) provides confidence intervals; and (e) is applicable to single-participant designs (Byiers et al., 2012).

Threats to Validity

Internal Validity

Strong internal validity is one of a single-participant design's strengths. Nonetheless, threats to internal validity can still present themselves in a study. Potential threats to internal validity include history effects, participant attrition, and ambiguity about the direction of causal inferences. *History effects* are described as events occurring outside a study that can affect the behaviors of the participants and can thus affect the results of the study (O'Neill et al., 2011; Rumrill et al., 2011). In other words, an event

could have occurred in the lives of the participants in this study that affected their ERC skill performance levels. History effects cannot be controlled (Creswell, 2012).

Participant attrition occurs when the outcome of a study is affected by participants not completing the study (O'Neill et al., 2011; Rumrill et al., 2011). In other words, the validity of outcomes related to the effect of the metacognitive reading strategy and the effect of the ERC on kindergarten students with intellectual disabilities could have decreased as a result of participants not completing the study. None of these internal validity threats were present in this study.

External Validity

External validity is more limited with single participant designs. However, some degree of external validity can be achieved with repeated trials (O'Neill et al., 2011; Rumrill et al., 2011). In my study, repeated trials of the intervention produced similar positive results, thus adding to external validity of the intervention. Replication of this study in the future may add to external validity of this intervention.

Ethical Procedures

Ethical procedures help to protect participants from harm (Creswell, 2012). The IRB ensured that the study included the use of ethical procedures to protect participants from harm (Creswell, 2012). I did not collect data from my students. I consulted with the IRB regarding the vulnerable population in my study and the uniqueness of my study. I obtained consent from the IRB before I conducted this study. The IRB of Walden University conducted a review process. I also obtained certification from the National Institutes of Health (NIH) Office of Extramural Research to conduct research.

I expected that the benefits of the study would outweigh the risks. The participants were able to withdraw from the study at any time. I kept participants' personal information confidential by not using their names in the study; instead, I assigned a number to each participant. Likewise, I did not expose the exact location of the school that participants attended in this study. Rather than providing the address of the school, I have provided the region and country of the school. I have kept the study data in a secure place.

Summary

Throughout Chapter 3, I have addressed methodology components that assisted me in answering the research question. The IRB approved my study before I began data collection. My research question addressed the effects a metacognitive strategy on the ERC skills of four kindergarten students with intellectual disabilities. I implemented a multiple baseline design to determine whether a functional relationship existed between the metacognitive reading strategy and ERC skills of kindergarten students with intellectual disabilities. I collected the data by indicating participants' number of correct responses during the baseline and assessment of a metacognitive reading strategy phases (intervention). Visual graphic data and an effect size statistic were used to analyze the data. In Chapter 4, the results of the study are discussed and illustrated.

Chapter 4: Results

The purpose of this study was to determine the effects of a metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities. The research question was the following: What are the effects of the use of a metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities? The null hypothesis was as follows: The metacognitive reading strategy did not significantly affect the ERC skills of kindergarten students with intellectual disabilities. The alternate hypothesis was the following: The metacognitive reading strategy significantly affected the ERC skills of kindergarten students with intellectual disabilities. A discussion of how I addressed the research question and tested the hypothesis is presented in this chapter. These various components consisted of data collection, intervention, intervention fidelity, data analysis, results, and a summary.

Data Collection

During Sessions 1, 2, and 3, the baseline data were collected. During Sessions 4, 5, 6, 7, and 8, the intervention data were collected. Each of the baseline sessions and intervention sessions was about 20 minutes in length. There were no problems concerning the data collection based on the methodology as described in Chapter 3.

Baseline Descriptive and Demographic Characteristics of the Sample

For the baseline phase, I read three stories to the participants from the Unique Learning System (see Appendices A and B). The participants had a choice of three pictorial/word answers. After each story was read, the participants were asked questions related to the passage. The numbers of correct responses the participants provided were

documented on a data collection form. The baseline phase took place over three consecutive sessions for each participant. Each session lasted about 20 minutes.

Table 1

Demographic Data of Participants

Participants' disability	Participants' gender	Participants' ethnicity	Participants' grade level
Mild intellectual disability	Female	Caucasian	Kindergarten
Mild intellectual disability	Female	Caucasian	Kindergarten
Moderate intellectual disability	Male	African-American /Caucasian	Kindergarten
Moderate intellectual disability	Male	Caucasian	Kindergarten

Table 1 provides demographic data for the participants. I conducted the study in the southeastern region of the United States in a major metropolitan area. The students at the study's site were required to turn 5 years of age before the first of September to attend kindergarten. The participants were four kindergarten students classified with intellectual disabilities. Two participants were girls, and two participants were boys. Two female participants were classified with a mild intellectual disability. Two male participants were classified with moderate intellectual disabilities. In addition, three participants' ethnic backgrounds were Caucasian, and one participant's ethnic background was African American and Caucasian. All four participants had already gone through special education eligibility testing and had been diagnosed with an intellectual disability. The participants' ages were from 4-6 years.

Intervention Fidelity

The ERC intervention was employed as planned. No challenges inhibited the planned implementation of the intervention as described in Chapter 3. There were no adverse effects to the participants associated with the intervention.

Data Analysis

I based the data analysis on changes in measured reading ERC skills between the baseline and intervention phases. A multiple baseline design compared the differences of the values between the baseline phases and the intervention phases (O'Neill et al., 2011). The graphed data illustrate an increase in the number of correct responses between the baseline phase and the intervention phase for each of the four participants by no overlapping data points. Further, the graphs illustrate the participants' number of correct responses by the intervention data points exceeding the baseline data points. An effect-size statistic was employed to analyze the results of this study. The effect-size statistic was based on IRD (Parker et al., 2009). The IRD calculations showed an improved rate difference between the baseline phase and the assessment of the metacognitive reading strategy phase (intervention) based on the results of this study. In order to calculate the IRD, the improvement rate (IR) must be calculated for the baseline phase and the intervention phase. The IR baseline result was based on dividing the improved data points by the total number of data points into within the baseline phase. The IR intervention result was based on dividing the improved data points by the total number of intervention data points.

Results

Graphs were produced to show a visual representation of the baseline phase and the assessment of a metacognitive reading strategy (intervention). Intervention data points that did not overlap with the baseline data points and exceeded the baseline data points illustrated improvement between the baseline phase and the intervention phase. The effect-size statistical measurement employed was the IRD. The purpose of the IRD was to measure the percentage of improvement between the baseline phase and the assessment of a metacognitive reading strategy phase (intervention). If the results showed improvement between the baseline phase and the assessment of a metacognitive reading strategy phase, then the metacognitive reading strategy significantly affected the ERC skills of kindergarten students with intellectual disabilities. The overall results of the intervention were shown to be significant for all four participants.

Figure 1 illustrates the baseline and intervention data for the first participant's number of correct responses. The results for the baseline data for Participant 1 were as follows: 1 out of 3 correct, 2 out of 3 correct, and 2 out of 3 correct. The intervention results for Participant 1 were as follows: 3 out of 3 correct, 3 out of 3 correct, 3 out of 3 correct, 3 out of 3 correct, and 2 out of 3 correct.

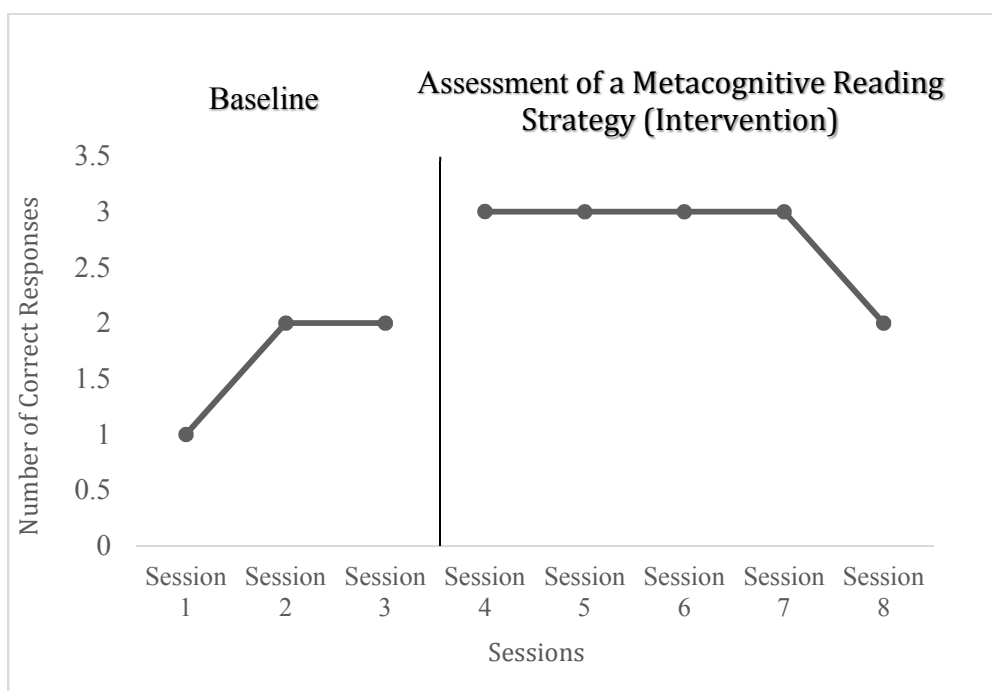


Figure 1. Participant 1 responses before and during assessment of a metacognitive reading strategy (intervention).

The IR intervention result was 80%. This result was due to the intervention data exceeding the baseline data and the intervention data not overlapping with the baseline phase. The IRD results for Participant 1 indicated an 80% improvement between the baseline phase and the intervention phase. Therefore, the results prompted the rejection of the null hypothesis, and that the metacognitive reading strategy was understood to have significantly affected the ERC skill of this participant.

Figure 2 illustrates the baseline and intervention data for the second participant's number of correct responses. The results for the baseline data for Participant 2 were as follows: 1 out of 3 correct, 1 out of 3 correct, and 0 out of 3 correct. The intervention results for Participant 2 were as follows: 2 out of 3 correct, 3 out of 3 correct, 2 out of 3 correct, 1 out of 3 correct, and 1 out of 3 correct.

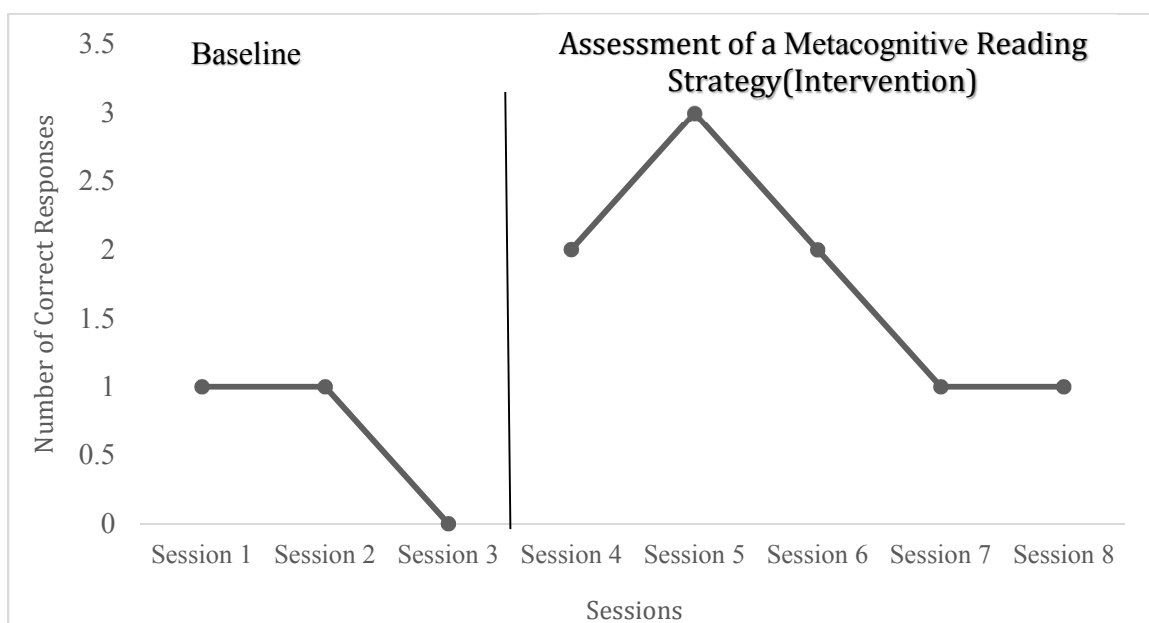


Figure 1. Participant 2 responses before and during assessment of a metacognitive reading strategy (intervention).

The IR intervention result was 60%. This result was due to intervention data that exceeded baseline data and intervention data that did not overlap with baseline data. The IRD intervention results revealed a 60% improvement rate between the baseline phase and the intervention phase. The results promoted the rejection of the null hypothesis and indicated that the metacognitive reading strategy significantly affected the ERC skills of this participant.

Figure 3 illustrates the baseline and intervention data for the third participant's number of correct responses. The results for the baseline for Participant 3 were as follows: 1 out of 3 correct, 1 out of 3 correct, and 1 out of 3 correct. The intervention results for Participant 3 were as follows: 2 out of 3 correct, 1 out of 3 correct, 2 out of 3 correct, 2 out of 3 correct, and 2 out of 3 correct.

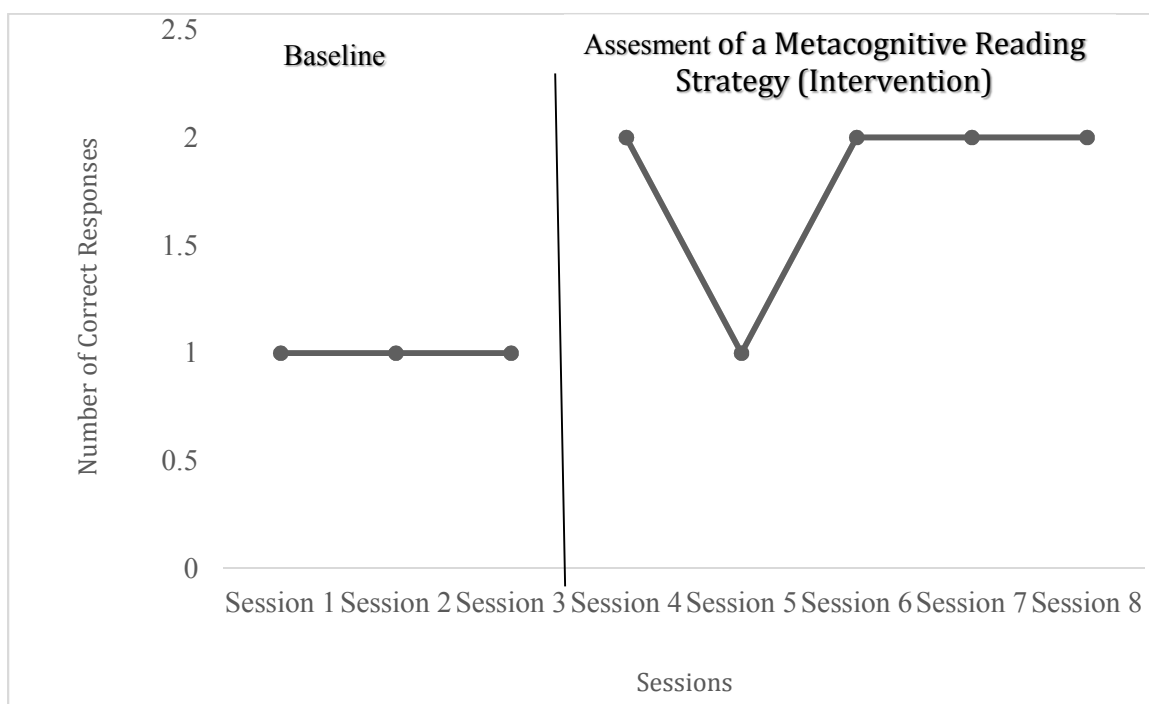


Figure 3. Participant 3 responses before and during assesment of a metacognitive reading strategy (intervention).

The IR intervention result was 80%. This result was due to the intervention data exceeding the baseline data and the intervention data not overlapping with the baseline data. The IRD result showed an 80% improvement rate between the baseline phase and the intervention phase. The results prompted the rejection of the null hypothesis and indicated that the metacognitive reading strategy significantly affected the ERC skills for this participant.

Figure 4 illustrates the baseline and intervention data for the fourth participant's number of correct responses. The results for the baseline data for Participant 4 were as follows: 1 out of 3 correct, 2 out of 3 correct, and 0 out of 3 correct. The intervention

results for Participant 4 were as follows: 1 out of 3 correct, 3 out of 3 correct, 2 out of 3 correct, 3 out of 3 correct, 3 out of 3 correct, and 3 out of 3 correct.

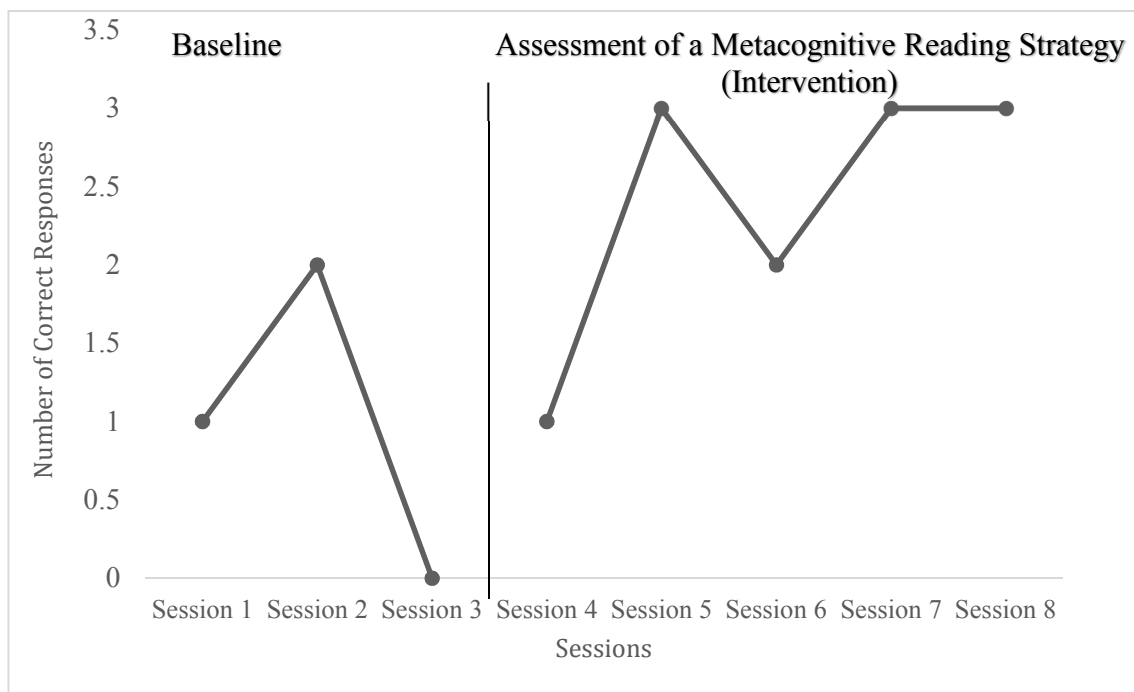


Figure 4. Participant 4 responses before and during assessment of a metacognitive reading strategy (intervention).

The IR intervention data result was 60%. This result was due to the intervention data exceeding the baseline data and the intervention data not overlapping with the baseline data. The IRD result showed a 60% improvement rate between the baseline phase and the intervention phase. The results prompted the rejection of the null hypothesis and indicated that the metacognitive reading strategy significantly affected the ERC skills for this participant.

The results were significant for all four participants, and the IRD ranged between 60% and 80%. This is considered to be a substantial gain score and effect-size statistic

(Parker, 2009). Thus, it appears that the intervention used in this study was successful in improving the ERC skills of kindergarten students with intellectual disabilities.

Summary

I investigated the effects of a metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities. Overall, the metacognitive reading strategy (intervention) positively impacted the ERC skills of kindergarten students with intellectual disabilities. I collected baseline and intervention data for 20 minutes per session. The baseline phase encompassed three sessions, and the intervention phase included five sessions. The ERC data were collected with fidelity. I analyzed the data based on measured reading ERC skills of the participants. All participants showed significant improvements to the intervention based on visual analysis of graphed data and the IRD calculations. According to the results of this study's IRD calculations, the metacognitive reading strategy improved the ERC skills of kindergarten students with intellectual disabilities. Therefore, the null hypothesis was rejected. Graphed illustrations were provided to illustrate data concerning the baseline phase versus assessment of a metacognitive reading strategy (intervention). In Chapter 5, I will discuss the interpretation of findings, limitations of the study, recommendations, and implications.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this multiple baseline single-participant design study was to examine the effects of a metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities. This study was conducted to address the gap in special education practice concerning ERC. The results of this study add to evidence-based literature on effective instructional practices for students with intellectual disabilities at the kindergarten level. I graphed the results from the study, and I conducted an effect-size statistical measure. Results overall were significant and showed that the intervention increased ERC skills for all participants.

The implementation of an evidence-based strategy can be beneficial in addressing the ERC skills of students with intellectual disabilities (Beecher & Chidre, 2012; Broek et al., 2011; Hudson et al., 2013; Qanwal & Karim, 2014). This study examined the effects of a metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities by implementing a three-session baseline procedure and a five-session intervention procedure across four kindergarten participants with intellectual disabilities (Byiers et al., 2012). The baseline and intervention sessions were about 20 minutes in length. The baseline sessions involved reading an entire passage to the kindergarten students with intellectual disabilities and then asking three questions related to the passage. The intervention sessions consisted of asking purposefully placed questions (throughout the passage) while reading to the kindergarten students with intellectual disabilities. The kindergarten participants with intellectual disabilities had a choice of three picture/word cards to answer the questions presented in the baseline phase

and the intervention phase. The quantitative research design I used in this study was a single-participant multiple baseline design. I implemented this design because it is known to be an effective way to determine the impact of an intervention concerning students with intellectual disabilities (Courtade et al., 2015). Additionally, this design supported the validity and reliability of the study's results through repeated trials of the intervention (Byiers et al., 2012; Horner & Baer, 1978; Laureate Education, Inc., 2012; O'Neill et al., 2011; Rumrill et al., 2011). In other words, the replication of the same metacognitive reading intervention (across the four participants with intellectual disabilities) convincingly illustrated that the results of the study were due to the intervention.

I collected data using a secondary analysis at a nonprofit private educational site. The secondary analysis had two purposes. As a volunteer, I collected data for the educational site in the southeastern region of the United States, located in a major metropolitan area. The secondary purpose was to collect data for this research study. Therefore, the nonprofit educational site not only owned the results of the data collected, but also allowed me to use the results of the data for this research study.

There was a null hypothesis and an alternative hypothesis in this study. The null hypothesis was that the metacognitive reading strategy did not significantly affect the ERC skills of kindergarten students with intellectual disabilities. The alternative hypothesis was that the metacognitive reading strategy significantly affected the ERC skills of kindergarten students with intellectual disabilities. I conducted the data analysis with both graphed data and the effect-size statistic. I used the IRD statistic because it provided a way to determine the percentage of improvement rate between the baseline

phase and the intervention phase (Parker, 2009). Overall, the participants' effect-size scores showed a significant improvement in the baseline phase versus the intervention phase. The results of this study indicate that the metacognitive reading strategy significantly affected the ERC skills of kindergarten students with intellectual disabilities. Therefore, the results prompted me to reject the null hypothesis.

Interpretation of the Findings

In the literature, many researchers have discussed using a metacognitive reading strategy to support not only reading comprehension, but also ERC skills (Beecher & Chidre, 2012; Qanwal & Karim, 2014). However, the researchers in these studies have not addressed kindergarten-level participants with intellectual disabilities. Moreover, the researchers in these studies have not solely addressed the metacognitive strategy used in this study concerning kindergarten participants with intellectual disabilities. When I implemented the metacognitive reading strategy, the effect-size statistic showed significant improvements between the baseline phase and the assessment of a metacognitive strategy phase (intervention). In other words, participants' number of correct responses improved between the baseline phases and the intervention phases. Throughout this study, I extended knowledge to special educational practices because the study emphasized the effects that a metacognitive reading strategy had on the ERC skills of kindergarten students with intellectual disabilities. Additionally, I extended knowledge to special education practices because the study's focus was on the effects of questioning while reading to kindergarten students with intellectual disabilities. Therefore, the results of this study not only extended knowledge to special education practices, but also

confirmed the implementation of a metacognitive reading strategy for ERC among kindergarten students with intellectual disabilities.

In addition, I addressed a gap in special education practice by providing a metacognitive reading strategy proven to positively impact the ERC skills of kindergarten students with intellectual disabilities. According to Piaget's and Vygotsky's constructivism tenets, learning is developed through a cognitive building block process (assimilation, accommodation, and equilibration) that involves gradually combining old knowledge with new knowledge to learn a new concept. These constructive theories clearly supported the framework of this study. In other words, when the kindergarten students with intellectual disabilities were given specific clues about reading content, these clues appeared to create metacognitive aids that facilitated ERC skills. The graphed and IRD results in this study revealed that implementing a metacognitive reading strategy (with a systematic direct scaffolding instructional approach) had a positive effect on the ERC skills of students with intellectual disabilities between the baseline phases and intervention reading strategy phases.

Limitations of the Study

There were several limitations to this study. The study had some limitations involving participant selection. Four individuals participated in this study. Although the participation pool was small, it was still within the norm for single-participant designs. There were also limitations regarding the classifications of the participants. All participants were kindergarten students, and the study was limited to those kindergarten students with intellectual disabilities. External validity is more limited with single-

participant designs because of the small number of participants. The ERC intervention's subsequent replication can help increase the external validity of this intervention. Thus, efforts to generalize the results from this study should proceed with caution.

There were some limitations relative to the setting of the study. I conducted the study in a nonprofit private school, located in a large metropolitan area in the southeastern region of the United States. In this study, the analysis of data was limited to a visual graphic analysis and the effect-size statistic.

Recommendations

Several recommendations emerge from this study. One recommendation is to replicate this study to increase external validity. An additional recommendation is to determine the effects of a metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities based on oral language levels (Parkin, 2016; Ricketts et al., 2013). Pursuing this recommendation may be essential to determine whether the metacognitive reading strategy used in this study has the same impact on kindergarten students with intellectual disabilities with different oral language levels. Another recommendation is to evaluate the effects of a metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities at several points in time during the kindergarten school year. In this way, it may be possible to show the metacognitive reading strategy's potential cumulative effects over an academic school year concerning the ERC skills of kindergarten students with intellectual disabilities. A final recommendation is to determine the effects of a metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities across different

instructional settings with different academic content (Knight, Spooner, Browder, Smith, & Wood, 2013). In other words, it would be prudent to investigate whether kindergarten students with intellectual disabilities can use the metacognitive reading strategy to comprehend expository concepts.

Implications

There are several implications for positive social change based on the results of this study. First, kindergarten students with intellectual disabilities may benefit by increasing their reading achievement (Edwards, 2014; Girard et al., 2013; Kucirkova, Messer, & Whitelock, 2012; Schryer, Sloat, & Letourneau, 2015). A strong reading foundation can improve the probability of reading success in the future. Second, implementation of the ERC intervention employed in this study may help teachers to increase their instructional expertise related to kindergarten students with intellectual disabilities (Cook & Cook, 2011). Finally, this study may help in addressing a gap in special education practice and special education literature by illustrating the positive effects of a metacognitive strategy for ERC (Courtade et al., 2015).

Conclusion

The purpose of this study was to investigate the effects of a metacognitive reading strategy on the ERC skills of kindergarten students with intellectual disabilities. The results of this study indicate that the metacognitive reading strategy significantly affected the ERC skills of kindergarten students with intellectual disabilities. The chosen theoretical framework supported the study by showing improvement between the baseline phases and intervention phases in which I implemented the metacognitive reading

strategy using a systematic scaffolding instructional approach. This research study was limited to four kindergarten students with intellectual disabilities, the implementation of a metacognitive reading strategy, and measurements of ERC skills. Recommendations for future study include implementing the metacognitive reading strategy across time, academic content, settings, and oral language levels. This study may support positive social change through not only increasing instructional educators' expertise, but also increasing students' ERC skills, which, in turn, may support their future reading achievement. This study addresses a gap in special education practice and adds to the special education literature.

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² From *Single Case Designs in Educational and Community Settings* (p 23; figure 2.2),
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Appendix B: Permission to Use the Unique Learning System

Permission letter to use Unique Learning System.

From: Anne Johnson-Oliss <anne@n2y.com>

To: Natasha Cox-Magno <ncoxmagno@aol.com>

Sent: Fri, Jun 17, 2016 8:19 am

Subject: Re: A letter to use The unique learning system in my study.

Congratulations Natasha!

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Congratulations on your academic work! We would love to see a copy when you have finished.

Best of everything from n2y,
~Anne

Appendix C: Data Collection Permission



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Mar 17, 2017

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