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Comprehension is a vital part of learning to read (Copeland, 2007); however, research on comprehension instruction for students with SID is limited (e.g., Browder, Wakeman, Spooner, Ahlgrim-Delzell, & Algozzine, 2006), and there is no clear evidence-based practice for teaching comprehension to students with SID. Teachers may acquire knowledge of comprehension instruction through professional development, but often struggle translating learned knowledge into practice (Rock, Zigmond, Gregg, & Gable, 2011). One way to facilitate teachers' transfer is through *e*Coaching. Therefore, purpose of this study was to investigate the effects of job-embedded professional development (i.e., online module + *e*Coaching) on teachers as they provided comprehension instruction to students with SID.

The researcher used a single subject, multiple-baseline across participants' design (Gast, 2010) to investigate the effects of an online module plus *e*Coaching on teachers' use of the CAR and CROWD during shared reading for students with SID and the impact on students' listening comprehension. Three Teacher Participants and three Student Participants participated in this study. The setting was a separate school in the Southeast. Dependent variables included teacher opportunities to respond (OTR), frequency and variety of teacher questioning with the CROWD strategy, student engagement, and student independent correct responses to listening comprehension questions.

Results indicated the online module plus *e*Coaching was effective in increasing teacher OTR, questioning, and independent correct responses; and confirmed the efficacy

of an online module plus *e*Coaching as effective way to support teachers as they begin to provide comprehension instruction to students with SID. Limitations, implications, and future directions are discussed.

EFFECTS OF ONLINE MODULE + *e*COACHING ON COMPREHENSION INSTRUCTION FOR STUDENTS WITH SIGNIFICANT INTELLECTUAL DISABILITY

by

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"For I know the plans I have for you," says the Lord. "They are plans for good and not for disaster, to give you a future and a hope."

Jeremiah 29:11

APPROVAL PAGE

This dissertation written by AFTYNNE ELIZABETH CHEEK has been approved by the following committee of the Faculty of The Graduate School at The University of North Carolina at Greensboro.

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TABLE OF CONTENTS

Page

LIST OF TABLES

Page

LIST OF FIGURES

Page

CHAPTER I

INTRODUCTION

Prior to 1975, students with disabilities were routinely excluded from public school (Yell, 2012). However, those students with disabilities who were permitted to attend school did not receive an appropriate education designed to meet their unique learning needs (Yell, 2012). Specifically, for students with significant intellectual disability (SID) who have significant limitations in intellectual functioning and adaptive behavior (Shalock et al., 2010), education focused primarily on rehabilitation and custodial care (Gardner, 1993). With the passage of the Education for All Handicapped Children's Act (EAHCA, 1975), students with disabilities, including those with SID, received the right to a free and appropriate public education (FAPE) until the age of 21. However, educational rigor for students with SID was non-existent because it was believed that these students would not benefit from it, and that they were incapable of learning functional tasks, such as dressing oneself (see Courtade, Spooner, Browder, & Jimenez, 2012). This notion was well illustrated in *Christmas in Purgatory* (Blatt & Kaplan, 1974):

> Although we are convinced that to teach severely retarded adults to wear clothes one must invest time and patience, we believe it possible to do so-given adequate staff. There is one more requirement. The staff has to be convinced that residents can be taught to wear clothes, that they can be engaged in purposeful activities, that they can learn to control their bladders. The staff has to believe that their "boys" and "girls" are human beings who can learn (p. 28).

Unfortunately, providing academic instruction for students with SID would not enter the professional discussion for many years to come.

Since 1975, the development, promotion, and enactment of policy and legislation centered on improving the education for all students, including those with SID, has increased in the United States. With the passage of the Elementary and Secondary Education Act of (ESEA, 1965), the federal government began providing funding to states in order to educate students in certain groups. In 1990, EAHCA became the Individuals with Disabilities Education Act (IDEA), and in the 1997 amendment of the law, the aim was to improve the effectiveness of special education and measure the effectiveness of the law, in part, through students' educational achievement (Yell, 2012).

Eleven years later, President Bush passed the No Child Left Behind Act (NCLB) of 2002- a reauthorization of ESEA. With this reauthorization came increased accountability for schools, school districts, and states when providing education to students with disabilities and "required all students achieve high academic standards by attaining proficiency or better in reading and mathematics" (Yell, 2012, p. 150). NCLB (2002) consisted of ten titles, two of which set the stage for this study. First, Title I: Improving the Academic Achievement of the Disadvantaged, and the largest section of NCLB, focused on (a) content standards, accountability and assessment, and (b) student reading skills improvement grants. In the first provision, all states set proficiency standards (i.e., adequate yearly progress; AYP) that increased the percentage of students in a district needed to meet proficiency of better in reading and mathematics (see Yell, 2012). The second provision included a national initiative designed to help students

become proficient readers by third grade entitled the Reading First Initiative. The Reading First Initiative emphasized a focus on reading instruction supported by scientifically-based reading research, provided funding to states for teacher training and professional development activities, and emphasized early identification of children at risk for reading failure. Second, the purpose of Title II: Preparing, Training, and Recruiting High Quality Teachers and Principals, was to assist states, through funding, in their efforts to increase the amount of highly qualified teachers- teachers who hold a minimum of a bachelor's degree from a college or university, are fully certified and hold a license in the area in which they teach, and demonstrate subject matter competency by passing the state-administered test- in classrooms (Yell, 2012). With these funds, states could provide professional development activities for teachers, establish innovative professional development programs, and partner with institutions of higher education (IHE).

In 2004, President Bush signed the Individuals with Disabilities Education Improvement Act (IDEIA), which included measures to increase academic results for students with disabilities. According to IDEIA (2004), teachers were required to use scientifically based instructional practices and schools were required to demonstrate students with disabilities, including those with SID, were making AYP in reading and mathematics from third through eighth grade, and in high school (Browder & Spooner, 2011). Recently, congress passed the Every Student Succeeds Act (ESSA, 2015), the long awaited reauthorization of ESEA and NCLB. Overall, this newly enacted federal

legislation maintains the focus on reading and mathematics achievement for all students, requiring testing three times between grades 3 and 12.

Because of their unique learning needs, states have flexibility to assess students with SID using alternate assessments based on modified or alternate achievement standards (AA-AAS)- assessments designed to measure academic performance of students with SID (Browder & Spooner, 2011). Eligibility determination varies between states; however, students who require intensive instruction and substantial adaptations, modifications, and supports to access the general curriculum typically take the alternate assessment. The students' Individualized Education Program (IEP) team determines how a student will participate in the statewide assessments. As described in Browder and Spooner (2011), the format of the alternate assessment generally includes: (a) performance assessments, (b) portfolios, and (c) checklists, and may assesses math, language arts, science, and social studies. Performance assessments are created by the states, contain preselected tasks related to the general curriculum, and are given to all students. Portfolio assessments require the teacher to select content for the assessment following state guidelines. Checklists are developed by the state and completed by the teacher based on previously observed classroom performance and classroom based assessments (Browder & Spooner, 2011). One key feature of alternate assessments is the use of alternate response modes, which may include manipulatives (e.g., counting blocks) or picture responses (e.g., teacher provides student with three pictures and student chooses the correct one). Overall, alternate assessments are used for accountability-school, student, or both, and states set the specific level of proficiency. Regardless of the

format, alternate assessments are designed to assess the academic achievement of students with the most intensive support needs (Browder & Spooner, 2011).

Taken together, NCLB, IDEIA, ESSA, and alternate assessment conveyed a message about "personal responsibility" (Turnbull, 2005, p. 320) by making accountability a priority for all students, including those with SID. According to the US Department of Education (USDOE), the goal of K-12 education is to graduate students who are college and career ready, regardless of income, race, ethnic or language background, or disability status by holding all students to high academic standards (ESSA, 2015). In order to do this, (1) students need a "well-rounded education" (USDOE, 2010, p. 4) that includes instruction in a variety of subjects, including literacy; and (2) teachers need "ongoing support for improving their educational practices through effective, ongoing, job-embedded, professional development that is targeted to student and school needs" (USDOE, 2010, p. 15).

National Focus on Literacy

Developing proficient readers has been a long-term goal of American education (Browder et al., 2009), and the Reading First Initiative set the stage for providing scientifically based reading instruction. Authors of various reports (e.g., National Reading Panel [NRP], 2000; Partnership for Reading, 2003; RAND Reading Study Group, 2001) have confirmed reading achievement for K-12 students as a top concern in the United States. In 2011, Dr. G. Reid Lyon, Chief of the Child Development and Behavior Branch at the National Institutes of Health (NIH) cited the lack of adequate literacy skills as one of the key contributors to the overall educational and health

concerns because, according to research, students are consistently unable to understand and use language. In fact, according to the U.S. Department of Education (2001), more than 8 million American students in Grades 4 to 12 are not fluent readers. Recently, the National Association of Educational Professionals (NAEP; 2015) reported that 64% of forth graders are reading below proficiency. With more than 3,000 students dropping out of high school every school day (Partnership for Reading, 2003) because of poor reading skills, it's understandable why "literacy is a national priority" (Erickson, Hatch, & Clendon, 2010, p. 1).

America's goal for education is clear: every student should graduate college and career ready and have meaningful opportunities after graduation from high school (USDOE, 2010). To accomplish this goal, the U.S. DOE challenged states to adopt state-developed standards in literacy that include rigorous content and help students become college and career ready. Additionally, states should assess students' academic achievement through assessments. Although federal policies and initiatives (e.g., Reading First) placed an emphasis on literacy for all students, this has not been the case for students with SID (see Kearns, Kleinert, Harrison, Sheppard-Jones, Hall, & Jones, 2011). For these students, literacy instruction has been largely overlooked because it is a "complex and poorly understood issue" (Erickson, Hanser, Hatch, & Sanders, 2009, p. 1). However, by not making literacy a priority for these students, as mandated by federal policies and laws, the academic and educational outcomes for students with SID remain limited and their life outcomes remain thwarted.

Criterion of the Least Dangerous Assumption

In 1984, Ann Donnellan introduced the criterion of the least dangerous assumption. In short, Donnellan posited that, "in the absence of conclusive data educational decisions should be based on assumptions which, if incorrect, will have the least dangerous effect on the student" Donnellan, 1984, p. 142). More recently, Jorgenson (2005) stated, "we should assume that poor performance is due to instructional inadequacy rather than student deficits" (p. 5). For example, teachers could assume students with SID will never learn to read or understand what was read to them (i.e., comprehend), and provide instruction that focuses only on sight words. By making this assumption, teachers violate the least dangerous assumption because they assume students with SID would not benefit from comprehension instruction, thereby denying students more rigorous content. Alternatively, if teachers take the least dangerous assumption, they assume students with SID can benefit from comprehension instruction and teach students comprehension strategies that will help them understand text. However, in order to teach students with SID more rigorous concepts, professionals involved in educating students with SID, must determine the most appropriate curriculum for the student- functional or academic.

Functional Curriculum vs. Academic Curriculum: Debates in the Field of SID

Among SID researchers, curriculum has been a source of longstanding debate and controversy. Some researchers (Ayers, Lowery, Douglas, & Sievers, 2011) have argued for a functional curriculum, while others (Courtade et al., 2012) have argued for an academically focused curriculum. Researchers who have argued for a functional

curriculum (e.g., Ayers et al., 2011) posited that since students have a limited amount of time in school to learn certain skills to mastery, the education of students with SID should focus mainly on functional skills (e.g., consumer, community, and self-help skills). By contrast others (e.g., Courtade et al., 2012) argue that the curriculum for students with SID should be standards-based focused because academic competence increases the available options for students with SID as adults, such as job opportunities, leisure activities, post-secondary education, and overall independence.

Although these researchers argued different approaches to educating students with SID, special education should be designed to benefit individual students (IDEIA, 2004). Moreover, the current emphasis centers on college and career readiness, which requires an academically focused and a functionally oriented curriculum. In some ways, however, the academic potential of students with SID remains unknown (Courtade et al., 2012). What is known is that students with SID can be taught to comprehend text (Browder, Mims, Spooner, Ahlgrim-Delzell, & Lee, 2008), solve algebraic equations (Jimenez, Browder, & Courtade, 2008), and participate in inquiry science lessons (Jimenez, Browder, Spooner, & DiBiase, 2012). Although functional skills are vital to success in both domains (e.g., college and career), they are not always a prerequisite for learning (see Courtade et al., 2012). Therefore, the curriculum for students with SID should be individualized to include instruction in academic and functional skills that are based on their unique learning needs and geared towards achieving college and career readiness.

Statement of the Problem

Providing literacy instruction that extends beyond learning sight words to include more rigorous concepts such as comprehension is relatively new for students with SID. To complicate the problem, research on comprehension instruction for students with SID has been limited (Browder & Spooner, 2011; Browder, Wakeman, Spooner, Ahlgrim-Delzell, & Algozzine, 2006). Research conducted by the National Reading Panel (2000), which included students without disabilities, recommended incorporating the following strategies to help students comprehend text- comprehension monitoring, cooperative learning, graphic and semantic organizers, question answering, question generation, and summarizing. Additionally, research conducted using students with high incidence disabilities confirmed comprehension strategy instruction was effective for this population. For example, Berkeley, Scruggs, and Mastropieri (2010) conducted a meta-analysis on reading comprehension instruction for students with learning disabilities (LD) and found that questioning yielded a large effect size (0.75) for improving comprehension for students with LD. Although researchers posited that there is no clear evidence-based practice for teaching comprehension to students with SID (Browder et al., 2006), there is some reason to suspect that comprehension strategy instruction, such as question answering using a mnemonic (e.g., CAR and CROWD), may be useful for students with SID.

In addition, providing comprehension instructions to students with SID is further complicated by the unique learning needs of these students. Students with SID often require intensive, explicit instruction and substantial modification and adaptations to text

(Browder & Spooner, 2011). Since the chronological age of students with SID may differ greatly from their reading levels (e.g., older students with SID may be non-readers), text used during comprehension may need to be adapted or "written on a lower grade level" (Browder & Spooner, 2011, p. 147). Additionally, and as discussed above, students with SID may require individualized and varied response modes (Browder & Spooner, 2011).

The limited research available for teaching comprehension to students with SID is concerning, especially because comprehension, along with phonics, phonemic awareness, fluency, and vocabulary instruction, was identified as one of the five components of effective reading instruction (NRP, 2000). Although each component of reading instruction is important, comprehension, listening and reading, impacts students' academic progress and readiness for the 21st century workforce (see Butler, Urrutia, Buenger, and Hunt, 2010). Additionally, researchers have identified comprehension as a vital part of learning to read (Copeland, 2007) and a critical component for academic and functional success (Wahlberg & Magliano, 2004) needed for college and career readiness.

Rationale for this Study

Comprehension is the essence of reading (Duffy, 2014), yet teaching students with SID to comprehend text is one of the greatest struggles teachers of students with SID currently face. This is for two reasons -- one, little research is available to guide comprehension instruction for students with SID (Cheek, Rock, Berkeley, under review).

Two, providing comprehension instruction to students with SID is a relatively new concept (see Copeland, Keefe, Calhoon, Tanner, & Park, 2011).

One way to help educators gain the knowledge needed to teach students to comprehend text is through job-embedded professional development. Job-embedded professional development is learning that is grounded in day-to-day teaching practice, occurs regularly, consists of teachers analyzing students' learning and finding solutions to immediate problems, and is aligned with state standards, school curricula, and school improvement goals (see Cogshall, Rasmussen, Colton, Milton, & Jacques, 2012). Unlike traditional professional development, which typically occurs outside of the classroom environment and infrequently aligns with ongoing teacher practice (Loucks-Horseley & Matsumoto, 1999), job-embedded professional development is designed to help teachers make the connection between learning and application in daily practice and is focused on the immediate use of the skill in classroom instruction (Croft, Coggshall, Dolan, Powers, & Killion, 2010). Researchers have confirmed teachers often struggle when translating knowledge learned in traditional professional development into their classroom practice (Rock, Zigmond, Gregg, & Gable, 2011). Specifically, Vaughn et al. (2004) posited that teachers struggled when translating literacy skills learned through traditional professional development into practice. Thus, job embedded approaches are preferred.

In their article, Joyce and Showers (1980) stated that in order for teachers to learn new content and transfer that knowledge into practice, in-service teacher training (e.g., job-embedded professional development) should include the study of theory or best practice, peer observation of best practice, one-on-one coaching, and group coaching.

The intervention used in this dissertation study reflects three out of the four components identified by Joyce and Showers (1982). Because peer coaching was beyond the scope and purpose of this study, and the professional literature available to support its use was limited, the researcher did not include peer coaching. Also, Taylor, Pearson, Peterson, and Rodriquez (2003) stated that coaching might help teachers implement effective comprehension instruction, and researchers indicated that coaching coupled with professional development leads to a greater rate of transfer of knowledge into practice (Joyce & Showers, 2002). Therefore, the independent variable used in this study was an online module plus *e*Coaching- "a relationship in which one or more persons' effective teaching skills are intentionally and potentially enhanced through online or electronic interactions with another person" (Rock et al., 2014, p. 162).

The rationale for this study was to expand researchers understanding and knowledge of how job-embedded professional development, focused on comprehension instruction for students with SID and delivered online to increase accessibility, coupled with *e*Coaching can help teachers of students with SID (1) acquire the knowledge and skills needed to provide effective comprehension instruction to students with SID, and (2) to investigate the overall impact students' listening comprehension.

Research Questions

The purpose of this study was to investigate the effects of job-embedded professional development (i.e., online module + *e*Coaching) on in-service teachers as they provided comprehension instruction to students with SID. To do this, the researcher investigated four research questions (RQ):

RQ 1. How does the online module plus *e*Coaching affect teachers' implementation of the CAR and CROWD, as evidenced by OTR, during shared reading for students with SID?

RQ 2. In what ways does the online module plus *e*Coaching impact the amount and variety of questions asked during comprehension instruction when teachers use the CAR and CROWD during shared reading for students with SID?

RQ 3. How does teachers' use of the CAR and CROWD impact listening comprehension outcomes for students with SID (i.e., frequency and accuracy of responses)?

RQ 4. How does teachers' use of the CAR and CROWD impact students with SID engagement during shared reading?

The researcher hypothesized that when provided an online module plus *e*Coaching, for the CAR and CROWD during shared reading, teachers would increase the amount, type, and variety of comprehension questions asked, students with SID would become more engaged and would correctly answer more comprehension questions.

Limitations of the Study

There were limitations associated with this study that were not controlled for by the researcher. The first limitation was the small, purposeful, and convenient sample used in the research design. Although researchers using single subject research designs always have small sample sizes (Gast, 2010), and because the unit of analysis included similar individuals (i.e., students with SID; Gall, Gall, & Borg, 2007), using a purposeful sample meant the sample may not accurately represent a larger population of students

with SID. Thus, the researcher's ability to generalize the results to the general population was limited (Horner et al., 2005). Second, student and teacher participants were not randomly assigned to a control or intervention group because the researcher used a multiple-baseline, single subject research design in which each participant acted as their own experimental control (Vannest, Davis, & Parker, 2013). Third, the researcher provided *e*Coaching throughout the study. This may have led to researcher bias because the researcher knew the purpose of the study, and may have unintentionally provided more *e*Coaching feedback targeted toward increasing teacher participants' questions. Fourth, in order to *Meet Evidence Standards* (Kratochwill et al., 2010) and *Acceptable Standards* for single subject studies (Horner et al., 2005), (a) the research design included six phases with at least five data points per phase and (b) each teacher and student measures were measured over time by more than one researcher (i.e., 20% of all sessions across all phases; Kratochwill et al., 2010). However, since the trained second observer was aware of the purpose of this study, this may have influenced her data (i.e., observer contamination; Gall et al., 2007). Fifth, because teacher participants were trained on CAR and CROWD through an online module, then *e*Coached on its use, the researcher was no table to identify which in the training package (module or *e*Coaching) was the most salient because the design did not include a component analysis. Sixth, after teacher participants were given access to the online module the researcher did remove their access to the content.

Delimitations of the Study

There were delimitations associated with this study. First the teacher participants were purposefully selected and invited to participate in this study. Second, participation in this study was voluntary. Third, the study occurred in the same setting in which the researcher completed her pilot study. The purpose of these delimitations was to ensure teacher and student participants met inclusion criteria.

Assumptions of the Study

There were also assumptions associated with this study. First, the researcher assumed teacher participants would answer the social validity survey honestly. Second, the researcher assumed the professional development module teacher participants received prior to the intervention, which focuses on the CAR and CROWD, was sufficient and adequate. Third, the researcher assumed teacher participants completed the entire training module based on their completion of the assessment at the end of the module. Fourth, the researcher assumed teacher participants had knowledge of shared reading and experience adapting materials, as needed, for their individual student participants.

Definition of Terms

A variety of terms used throughout this study were operationally defined for clarity and understanding. These terms are listed alphabetically below and provided in a codebook (see Appendix A).

Autism: a complex disorder that affects brain development, social interaction, communication (verbal and nonverbal), and may cause repetitive behaviors (Browder & Spooner, 2011)

Bluetooth Headset: An earpiece and microphone that provide a two-way audio connection to a computer or cellphone via Bluetooth technology (http://www.pcmag.com/encyclopedia/term/59735/bluetooth-headset). A Bluetooth headset enabled the coach (i.e., researcher) to communicate during the lesson via Skype.

Bluetooth Technology: Technology that enables data to be transmitted though radio transmission and serves as an alternative to traditional data cables (http://www.bluetooth.com/what-is-bluetooth-technology/Bluetooth).

CAR: (Comment and Wait, Ask Questions and Wait, Respond by adding a little more; Cole, Maddox, Lim, Yook, & Notari-Syverson, 2002). CAR Prompt was part of *Language is Key*, a program designed to help build early literacy skills in typically developing preschool children from linguistic minority populations by encouraging adult-child interactions during shared reading (Cole et al., 2002).

Comprehension: as the "act of constructing meaning from oral or written text" (Duke & Carlisle, 2011, p. 200)

Comprehension Strategies: "specific procedures that guide students to become aware of how well they are comprehending as they attempt to read and write" (National Reading Panel [NRP], 2000).

CROWD: (Completion, Recall, Open-ended, Wh questions, and Distancing prompts; Whitehurst, Epstein, Angell, Payne, Crone, & Fischel, 1994). A strategy used

to help adult readers (i.e., teachers) remember the various types of questions to ask during shared reading.

*e*Coaching: "A relationship in which one or more persons' effective teaching skills are intentionally and potentially enhanced through online or electronic interactions with another person" (Rock et al., 2014, p. 162).

Encouraging Feedback: "praise contingent on demonstration of a specific teaching behavior is provided" (Scheeler, et al., 2004, p. 399).

Instructive Feedback: "objective information related to predetermined specific teaching behaviors is offered" (Scheeler, et al., 2004, p. 399).

Job-embedded professional development: learning that is grounded in day-to-day teaching practice, occurs regularly, consists of teachers analyzing students' learning and finding solutions to immediate problems, and is aligned with state standards, school curricula, and school improvement goals (see Cogshall, Rasmussen, Colton, Milton, & Jacques, 2012).

Listening comprehension: the ability to understand spoken language (see Block & Pressley, 2002).

Literacy: ability to read and write (Erickson, Hatch, & Clendon, 2010).

Literacy instruction: the act of teaching students to read and write (Tomkins, 2010).

Questioning Feedback: sentences asked by the *e*Coach to clarify information about the instruction (Merriam-Webster, 2015).

Reading: deriving meaning from written or printed text (Carnine, Silbert, & Kame'enui, 1997), and the process in which readers read text for the first time independently (Tomkins, 2010).

Reading comprehension: the ability to understand written language (see Block & Pressley, 2002).

Shared Reading: a method of reading typically used for young children (Coyne, Simmons, Kame'enui, & Stollmiller, 2004) that fosters literacy concepts such as print awareness, phonological awareness, alphabetic knowledge, and metalinguistic awareness (Justice & Kadervak, 2002). Shared reading is an evidence-based practice for promoting literacy for students with SID (Hudson & Test, 2011).

Significant Intellectual Disabilities (SID): characterized as having significant limitations in intellectual functioning and adaptive behavior (Shalock et al., 2010), or as having an IQ < 55, who require substantial modifications, adaptations, or supports to meaningfully access grade level content and acquire and generalize knowledge (Browder & Spooner, 2011). The researcher used term SID to refer to students with moderate to significant intellectual disability and autism who have an IQ < 55.

Skype: "free internet-based telephony, Voice-over-iP (VoiP) system, that allows teachers-in-training to use the mobile device (a Bluetooth headset) to receive real-time feedback and professional coaching while delivering classroom instruction" (Rock et al., 2012).

Student Disengagement: student who is inattentive to the teacher, showing defiance to or ignoring teacher requests, out of seat, interacting with classmates in a way

other than directly related to the assigned task, blurting, and/or staring into the distance (modified from Courtade, Lingo, & Whitney, 2013 and Rock et al., 2009).

Student Engagement: "student attending to (i.e., looking at) the teacher, making appropriate motor responses (e.g., following directions, manipulating materials), asking for assistance in an appropriate manner, and interacting with peers or adults within the structure of the activity" (Courtade, Lingo, & Whitney, 2013, p. 9).

Summary

The ability to understand what is read greatly impacts students' academic progress and readiness for the 21st century workforce (see Butler et al., 2010). For students with SID, comprehension provides academic and functional benefits, which include, but are not limited to, accessing to the general curriculum (Hudson & Test, 2011) and gaining interdependence (Copeland & Keefe, 2007). Given its importance, effective comprehension instruction for students with SID should be a priority.

Unfortunately, comprehension instruction for students with SID is a "complex and poorly understood issue" (Erickson et al., 2009, p. 1). Additionally, there is a dearth of literature available that discusses comprehension instruction for this population (see Browder et al., 2006). Despite the complexity and scarcity of literature, teachers must provide comprehension instruction that incorporates scientifically based strategies, because providing rigorous literacy instruction is a national initiative (ESSA, 2015).

What is known is that teachers must be prepared to teach comprehension strategies (Taylor et al., 2003), and *e*Coaching can encourage and support teachers' use of these comprehension strategies in the classroom (Rock et al., 2009). Therefore, the

purpose of this study was to investigate (1) teacher's use of teacher directed comprehension strategies (i.e., CAR and CROWD) during shared reading for students with SID, and (2) the overall impact on students' listening comprehension and engagement. In Chapter II the researcher reviews the relevant literature on literacy and comprehension for students with SID, professional development and job-embedded professional development, and *e*Coaching. In Chapter III, the researcher discusses the methodology that will be used to carry out this investigation, which includes the research design, participants, setting, independent and dependent variables, procedures, data collection, and proposed data analysis procedures. In Chapter IV, the researcher provides the results of this study, and in Chapter V, the researcher provides a discussion, implications, and future directions.

CHAPTER II

REVIEW OF THE LITERATURE

This chapter includes a review of the relevant literature on literacy and comprehension for students with SID; professional development and job-embedded professional development; as well as coaching and *e*Coaching. First, the researcher discusses literacy instruction for students with SID, including comprehension instruction. Second, using transformative learning theory, the researcher discusses the importance of professional development and job-embedded professional development. Finally, the researcher discusses effective professional development, generally, and *e*Coaching, specifically. Finally, the researcher provides a summary of what is known and unknown in comprehension instruction and professional development for students with SID.

To identify relevant literature, a systematic, narrative literature review was conducted (Gall et al., 2007). To locate articles related to literacy, comprehension, and SID, a comprehensive search was conducted using the following electronic databases: *Academic Search Complete, ERIC, and PsycInfo* using the following terms: literacy, reading, comprehension, reading comprehension, listening comprehension, moderate intellectual disability, significant intellectual disability, severe disability, extensive support needs, significant cognitive disability, and autism. Following the electronic database search, a keyword search of authors (e.g., Diane Browder, Susan Copeland, Ginevra Courtade, Karen Erickson, Pamela Mims, and Fred Spooner) was conducted.

Then, to identify articles related to professional development, special education, and *e*Coaching the following terms were entered in to the aforementioned databases: professional development, in-service training, and special education. The initial search for all search terms resulted in 423 articles, which included duplicate articles, specific to this study. The review that follows consists of peer-reviewed articles relevant only to the purpose of this study.

An Overview of Literacy Instruction for Students with SID

Literacy is defined as the act of reading, writing, and thinking within society (Langer, 1991). For students with SID, literacy is defined as the ability to read and write (Erickson et al., 2010). Therefore, literacy instruction is the act of teaching students to read and write (Tomkins, 2010), and should include reading, phonics, reading and writing strategies, vocabulary, comprehension, content-area study, oral language, writing, and spelling (Juel, Biancarosa, Coker, & Deffes, 2003; Tomkins, 2010). For students with SID, literacy instruction provides them with opportunities to achieve academically and functionally. Academically, for students with SID, literacy instruction enables them to access, progress, and achieve the general curriculum, including comprehension of age appropriate literature (Hudson & Test, 2011). Functionally, literacy instruction also enables students with SID to participate fully in the community, to gain independence, and to participate in educational decision-making (Copeland & Keefe, 2007). Traditionally, for students with SID, literacy instruction has been placed on the backburner because it was a "complex and poorly understood issue" (Erickson et al., 2009, p. 1).

Although literacy encompasses both reading and writing, the focus of this investigation will be on one facet of literacy (i.e., reading), which is defined as deriving meaning from written or printed text (Carnine, Silbert, & Kame'enui, 1997). Throughout the professional literature regarding this topic, researchers use the term literacy to refer to reading. Therefore, in this investigation and in order to remain consistent with the terminology of the field, the researcher uses the term literacy.

Historical Approaches to Literacy Instruction for Students with SID

Historically, literacy curricula for students with SID were grounded in two approaches: a developmental approach (Kliewer & Biklen, 2001) and a functional approach (Browder et al., 2004). In the developmental approach, also referred to as the readiness approach (see Copeland & Keefe, 2007), teachers required students to master a subset of foundational literacy as prerequisite skills prior to engaging in more sophisticated instruction (Kliewer & Biklen, 2001). For example, a teacher using this approach would require students with SID to master letter names and sounds before being taught how to decode their names (see Copeland & Keefe, 2007). When using a developmental approach, general and special educators relied on the instruction of basic literacy skills (Katims, 2000) including "drill and practice" of sight words (Copeland & Keefe, 2007; Erickson & Koppenhaver, 1995, p. 676). These skills were often taught in a "decontextualized and disconnected manner" (Copeland & Keefe, 2007, p. 3) and in isolation of written text (Coyne, Pisha, Dalton, Zeph, & Smith, 2012).

By contrast, the functional approach emphasized life skills (Browder et al., 2004), during literacy instruction. Similar to the developmental approach, teachers taught

students sight words (e.g., stop and exit); however, they did so within the context of the school and community (see Copeland & Keefe, 2007). The functional approach improved on the developmental approach for students with SID because it removed prerequisites and fostered immediate, practical use. Both approaches focused on teaching sight words and basic literacy skills; unfortunately, the two lacked an emphasis on academic (e.g., general curriculum) comprehension (see Copeland & Keefe, 2007).

Prior Reviews of Literacy Instruction for Students with SID

To date, researchers have conducted several literature reviews on literacy instruction for students with SID. Some researchers reviewed literature on specific components of literacy, such as sight words (Browder & Lalli, 1991), sight words and functional reading (Browder & Xin, 1998), time delay (Browder, Ahlgrim-Delzell, Spooner, Mims, & Baker, 2009), shared reading (Hudson & Test, 2011), phonics (Joseph & Seery, 2004), and alternative and augmentative communication (AAC) devices (Machalicek et al., 2010). Other researchers examined the literature on literacy instruction for this population as a whole (i.e., Browder et al., 2006; Connors, 1992; Roberts, Leko, & Wilkerson, 2013). Since the focus of this investigation is on literacy instruction, the latter three reviews are discussed below.

In 1992, Connors conducted a literature review on reading instruction for students with mental retardation (note: this terminology reflects the language used by the author). To identify relevant literature, Connors conducted an online, electronic database search using one search engine (i.e., PsycLit), and through his search, identified three major groups of studies: sight-word instruction, word-analysis instruction, and oral-reading

error correction. Results of this review, directly related to this investigation, indicated literacy instruction for students with mental retardation focused primarily on sight-word instruction. Of the studies on sight-word instruction, those in which researchers integrated pictures with words (i.e., picture integration), constant time delay, and the Edmark Reading Program were the most effective in helping students identify more words and to recognize key words in their environments without sounding them out.

Fifteen years later, Browder et al. (2006) conducted a comprehensive review and meta-analysis of 128 studies on teaching reading to students with significant cognitive disabilities and compared the available research to the five components of effective reading instruction- phonics, phonemic awareness, vocabulary, fluency, and comprehension (NRP, 2000). In their review, Browder et al. (2006) included students with significant disabilities from pre-kindergarten through adulthood and included studies in which researchers used an experimental, quasi-experimental, or single subject research design. Researchers then conducted three rounds of coding specifically for the study characteristics, quality indicators, and effect size. After coding, researchers conducted a meta-analysis to assess the effects of various reading interventions used within the studies. Then they calculated the percentage of non-overlapping data (PND; Scruggs, Mastropieri, & Castro, 1987) for single subject studies, and either Cohen's *d* or the mean difference (ES index) for experimental and quasi-experimental studies. Finally, Browder and colleagues (2006) determined the extent to which studies met the quality indicators for single subject (Horner et al., 2005) and group experimental design (Gersten et al., 2005).

In 69% of the reviewed studies, researchers applied a single subject research design and most of the studies took place in research settings or self-contained special education classrooms. Similar to results of Connors (1992), results indicated most researchers targeted vocabulary instruction, specifically functional sight words; however, Browder et al. (2006) provided results for comprehension. Although a small number when compared to the overall amount of studies reviewed, researchers included a measure of comprehension (i.e., 18 functional comprehensions and 13 academic comprehension) in less than a third (n = 31) of the studies, but the type of comprehension questions asked (e.g., literal or inferential) was not provided. Also, Browder and colleagues (2006) noted in the discussion that researchers used question answering in the majority of the studies and found this strategy to be effective for students with SID.

Additionally, researchers calculated effect size. Of the 88 single subject studies, 65 contained sufficient data that enabled researchers to calculate PND. Sight-word instruction- the most frequent component- had the second highest PND of 85% and the mean PND for comprehension was 84%. Of the group studies, only three out of the 40 provided the date needed to determine the effect size. Overall the mean effect size for the group studies was 0.994 and the range was -0.16 to 8.33. Since six of the 20 effect sizes were negative and came from the same three studies in which investigators provided sufficient information, researchers were unable to determine the effect size for comprehension. In addition, Browder and colleagues (2006) provided no information on the specific components of comprehension instruction or the effectiveness of these components.

Seven years later, Roberts et al. (2013) reviewed 19 empirical studies published between 1975 and 2011 in which researchers investigated literacy instruction for adolescents with significant cognitive disabilities. In their review, Roberts and colleagues (2013) narrowed the focus of their review by examining the literature specific to adolescents, whereas Browder et al. (2006) focused on all ages, prekindergarten through adult. Roberts and her colleagues' review yielded similar results to Browder et al. (2006). In 84% of the reviewed studies, researchers used single-case design and most of the studies (84%) took place in self-contained special education classrooms. Similar to Connors (1992) and Browder et al. (2006), the majority of the researchers targeted sight word instruction. There were only four intervention studies wherein researchers targeted comprehension. In one of the four studies, the sole focus was comprehension (i.e., Browder, Trela, & Jimenez, 2007); and, in the other three investigators examined phonemic awareness in combination with comprehension (i.e., Collins, Hager, & Galloway, 2011; Collins, Branson, & Hall, 1995; Doyle, Gast, Ault, & Farmer, 1990). Specifically, the comprehension intervention used in Browder et al. (2007) included task analytic instruction, shared reading, and systematic prompting; Collins et al. (2011) integrated functional content during core content instruction; Collins et al. (1995) used a keyword approach to generalization; and Doyle et al. (1990) employed observational and incidental learning, and constant time delay.

Together these reviews provided an initial understanding of effective literacy instruction for students with SID. Although effective, apparent in all three reviews was the overreliance of sight-word instruction for teaching literacy to students with SID.

Results of two of the reviews (i.e., Browder et al., 2006; Roberts et al., 2013) indicated that researchers, in a limited amount of studies, were investigating comprehension for students with SID. Additionally, both of these research teams expressed concerns regarding the lack of explicit, intensive comprehension instruction occurring for students with SID, but neither review provided details about the components of comprehension instruction for these students or how to effectively teach comprehension to students with SID. They did, however, indicate that question answering, shared reading, and systematic prompting may be effective in teaching comprehension to students with SID.

In an era of increased accountability for all students, including those with SID (ESSA, 2015), providing students with literacy instruction that focuses primarily on sight words is not enough. Additionally, comprehension was identified as one of the five components of effective reading instruction (NRP, 2000). As stated previously, comprehension, listening and reading, impacts students' academic progress and readiness for the 21st century workforce (see Butler, et al., 2010), but it has been largely unexamined by researchers and overlooked in the instruction of students with SID. Therefore, in order for students, including those with SID to become college and career ready, they must understand what they read (Butler et al., 2010).

Comprehension Instruction

Researchers maintain that struggling readers, including those with SID, benefit from explicit comprehension instruction (Block & Duffy, 2008). Explicit comprehension instruction is defined as an activity that involves "clearly describing the mental processes needed to comprehend text independently" (Block & Pressley, 2002, p. 24). Teachers

play an important role when providing explicit comprehension instruction that enables students to learn and use these mental processes when reading. Specifically, Taylor et al. (2003) found that teacher instructional practices (i.e., teacher practices) were "important in ensuring the effectiveness of comprehension instruction" (p. 5). They also identified several key teacher variables that impact the effectiveness of comprehension instruction, two of which were comprehension strategy instruction and coaching.

Comprehension Strategy Instruction

Comprehension strategies are defined as "specific procedures that guide students to become aware of how well they are comprehending as they attempt to read and write" (NRP, 2000, p. 232). Although an abundance of strategies have been identified to help students comprehend text (e.g., question generation and story structure; NRP, 2000), for the purposes of this review, the discussion will be limited to question answering and mnemonic strategies. As noted in Chapter I, these strategies were chosen because questioning answering has been proven effective for increasing comprehension in students without disabilities (NRP, 2000) as well as with those who have learning disabilities (Berkeley, Scruggs, & Mastropieri, 2010), and researchers indicate mnemonic strategies are appropriate to use when teaching unfamiliar concepts to a variety of readers (Trabasso & Bouchard, 2002), such as those with SID. First, question answering is defined as a process in which "the reader answers questions posed by the teacher and is given feedback on the correctness" (NRP, 2000, p. 233). For example, the teacher may ask, "What color is the house," and the student may answer, "red." If this is correct, the teacher's feedback might be, "Correct Steve, the house is red."

Question answering can help students remember what is read (Trabasso & Bouchard, 2002), which may lead to increased comprehension of the text. Second, mnemonic strategies use an external memory aid, such as a word, to help students associate the meaning of the word or picture with the text (Trabasso & Bouchard, 2002). For example, ROY-G-BIV may help students remember the colors of the rainbow (red, orange, yellow, green, blue, indigo, and violet).

Not only do comprehension strategies refer to what *readers* do in order to understand text, but also they refer to what *teachers* do to help students comprehend text (Guzzetti, Alvermann, & Johns, 2002). In that respect, comprehension strategies can be student-led or teacher-led. Two examples of teacher-led comprehension strategies that incorporate both question answering and mnemonics are the CAR and the CROWD. First, the CAR stands for Comment and Wait, Ask Questions and Wait, and Respond by adding a little more (Cole, Maddox, Lim, Yook, & Notari-Syverson, 2002), and was part of *Language is Key*- a program designed to help build early literacy skills in typically developing preschool children from linguistic minority populations (Cole et al., 2002). Second, the CROWD stands for Completion, Recall, Open-ended, Wh questions, and Distancing prompts (Whitehurst et al., 1994), and was a major component of dialogic reading, which is a style of reading that encouraged adult-child interactions while reading picture storybooks (Whitehurst et al., 1994). Both the CAR and the CROWD encourage adult-child interactions and help students comprehend text. However, the CAR requires adult readers to follow the child's lead while the CROWD helps adult readers remember the various types of questions to ask when reading a story that can encourage higher

levels of thinking. For example, Tomkins (2010) states that comprehension involves different levels of questions. Therefore, teachers can ask (a) literal questions, which have explicitly stated answers, (b) inferential questions, which require readers to use clues in the text, (c) critical comprehension questions, which include distinguishing between fact and opinion, and (d) evaluative comprehension questions in which readers judge text and detect bias. Important to note is that in this dissertation study, the CAR and CROWD were used by the teachers, not by the students. See Appendix B for examples of each type of comprehension question.

The CAR and CROWD have primarily been used by adults during shared reading for preschool children. Whitehurst and colleagues (1994) conducted an experimental study in which they examined the effects of dialogic reading and sound foundations on the literacy development of 167, 4-year old children, who attended Head Start programs. Each of the preschool students were randomly assigned to one of two groups: a control group which participated in the Head Start Curriculum, and an experimental group which participated in interactive book reading at home and in the classroom as well as classroom-based sound and letter awareness activities.

During the intervention parents were trained on how to read dialogically through a 20-minute video, role-playing, and discussion. Additionally, parents were trained on how to use the CROWD and the PEER strategy (i.e., prompt, evaluate, expand, and repeat). Students were administered a pretest and a posttest. Pretest measures included the Peabody Picture Vocabulary Test-Revised, Form M, the Expressive One Word Picture Vocabulary Test, the Illinois Test of Psycholinguistic Abilities, and the

Developing Skills Checklist. Results of the pre and posttest indicated that students in the experimental group made significant gains in all of the assessments (i.e., writing, print concepts, language, and linguistic awareness). However, what was absent from this study was a measure of comprehension, and in the discussion, researchers addressed the need for further investigation of the long-term effects of the intervention on word decoding and reading comprehension in elementary school.

Although the CAR and CROWD have primarily been used during shared reading with preschool children, results of this study indicate that these strategies may be effective for students with SID for three reasons. First, dialogic reading is typically used with emergent readers or students who are learning to read (Browder & Spooner, 2011), and students with SID are typically classified as emergent readers. Second, the CAR and CROWD were both used during shared reading, the latter of which is an evidence-based practice for students with SID (Hudson & Test, 2011). Third, the CAR and CROWD are both teacher-led comprehension strategies, which may benefit students with SID who require intensive and explicit instruction to learn new skills (see Browder & Spooner, 2011).

Role of Text Genre in Comprehension

Comprehension involves reader factors (i.e., what readers know and do during instruction) and text factors (i.e., text genre). There are three broad categories of text, two of which are related to this study- narrative or storybooks and expository or informational (see Tomkins, 2010). Narrative texts tell a story designed to entertain the reader. In narrative texts, authors typically include the elements of characters, setting,

plot, problem, resolution, main idea, theme, and author's point of view (see Browder & Spooner, 2011). Since telling stories is a "natural human experience" (Browder & Spooner, 2011, p. 142), they are appropriate to introduce to learners learning how to read and understand text. The purpose of expository text is to inform the reader about a subject, content area (e.g., science or math). The format of expository texts is similar to that of narrative text, but expository texts may be less entertaining. Although the research on text genre is limited (NRP, 2000), the goal during comprehension instruction, should be to help students learn and use comprehension strategies during narrative texts and the transfer this knowledge to expository text (Browder & Spooner, 2011).

Comprehension Instruction for Students with SID

Comprehension instruction is multifaceted; therefore, it can be a complex process for teachers of students with SID to carry out effectively, because it requires students to actively participate in the lesson (Copeland & Keefe, 2007). Active participation can pose unique challenges for students with SID, such as holding books or seeing standard print (Erickson et al., 2009). Because of the multifaceted nature of comprehension instruction and the unique needs of students with SID, it is understandable why there is scant literature available. Thus far, only one review exists in which researchers examined the published literature on comprehension instruction for students with SID (i.e., Cheek, Rock, & Berkeley, under review).

In their review, Cheek et al. (under review) examined 18 peer-reviewed published studies that included an experimental research design (i.e., quantitative, quasi-experimental, and single subject) and a focused intervention on enhancing academic

comprehension for students with SID. Also, for inclusion, researchers must have measured and provided results for academic comprehension, and included at least one, K-12 student with SID or SID and autism. Although researchers did not conduct a meta-analysis, calculate effect sizes, apply the quality indicators for single-subject (i.e., Horner 2005) or group experimental design (i.e., Odom et al., 2005), and located only 18 studies, results of this review added to the professional knowledge base regarding effective comprehension instruction for students with SID. Findings confirmed that researchers primarily used shared reading- an evidence-based practice for teaching literacy to students with SID in which an adult reads aloud and provides support for the reader to interact with the story (Hudson & Test, 2011)- during comprehension instruction. Additionally, researchers used a combination of approaches (e.g., packaged curriculum, comprehension strategy instruction, task analysis, systematic prompting, and adapted materials) to provide effective comprehension instruction and taught in a variety of settings (one-on-one or small group). However; although text genre is an important feature of comprehension instruction, the use of text genre during comprehension instruction was not a major finding in Cheek et al.'s (under review) review. In the following section, studies in which researchers used combined approaches to comprehension instruction are discussed.

Combining Two Approaches During Comprehension Instruction

Shared reading and packaged curriculum. In 2012, Coyne, Pisha, Dalton, Zeph, and Smith examined the effects of the *Literacy by Design* (LBD) curriculum on the reading achievement of young adults with SID. This curriculum incorporated the

principles of universal design for learning (UDL) and addressed the five components of effective reading instruction noted by the NRP (2000). Researchers used a quasi-experimental design and results indicated moderate to large effects in increasing student's reading and listening comprehension. After controlling for initial reading achievement, the LBD group made significant gains in comprehension when compared to the control group. Specifically, the effect size for passage comprehension was 1.44 and listening comprehension was 1.00.

Shared reading and system of least intrusive prompts. Mims, Browder, Baker, Lee, and Spooner (2009) and Hudson and Browder (2014) combined shared reading with the system of least intrusive prompts. Mims et al. (2009) used a single subject, multiple-probe across materials design to examine the use of shared reading to increase listening comprehension in students with SID and visual impairments. Results of this study indicated students increased their correct, unprompted responses to researcher generated, literal comprehension questions. Similar to Mims et al. (2009), Hudson and Browder (2014) used a single subject, multiple-probe research design; however, they evaluated the effects of peer-delivered least intrusive prompts across participants. In their study, researchers trained peers to deliver least intrusive prompts during comprehension instruction, which occurred in a group format that included elementary students with SID and their typically developing peers. Results indicated all participants improved their prompted correct responses to literal comprehension questions from baseline to intervention, and two of the three students improved their independent correct responses to listening comprehension questions.

Shared reading and task analysis. Spooner, Rivera, Browder, Baker, and Salas (2009) taught emergent literacy skills to an elementary student with SID who was also and English Language Learner (ELL). Using a single subject, multiple-probe across skillsets design, Spooner et al. (2009) combined shared reading with a task analysis. During comprehension instruction, the paraprofessional conducted the story-based lessons using the task analysis and read each story in Spanish and English, as designated by the task analysis. Although only one student participated in this study, which limited the generalizability of the findings, the participant increased her correct responses to the researcher generated listening comprehension questions.

Combining Three Approaches During Comprehension Instruction

Shared reading, systematic prompting, and packaged curriculum. In two studies, researchers combined shared reading with systematic prompting and a packaged curriculum. Allor, Mathes, Roberts, Jones, and Champlin (2010) conducted their study using an experimental design (i.e., randomized control trial) to teach students with moderate intellectual disabilities to read. In their study, Allor et al. (2010) used the *Early Interventions in Reading* program and evaluated the effectiveness of the program by measuring changes in student achievement using the *Woodcock Language Proficiency Battery Revised* (WLPB-R). Results of the pre/post test indicated students in the treatment group increased comprehension by a mean of 2.63 on listening comprehension and 2.69 on passage comprehension. The control group had much lower gains with a mean increase of 0.92 on listening comprehension and 1.08 on passage comprehension. Beecher and Childre (2012) examined the effects of comprehensive reading instruction

combined with sign language. Researchers used an A-B time series design with a pretest and posttest. The curriculum used (i.e., PCI reading program) was a district-mandated program that focused on sight word instruction in combination with the other components of reading instruction. Results, which were measure by the *Woodcock Reading Mastery Test Revised* (WRMT-R), confirmed each student demonstrated an increase in listening comprehension. Specifically, Student 1 improved from less than one percent on the pretest to the 35th percentile on the posttest; Student 2 improved from less than one percent on the pretest to the 10th percentile on the posttest; and Student 3 improved from the 13th percentile on the pretest to the 27th percentile on the posttest.

Shared reading, task analysis, and packaged curriculum. In 2012, Browder, Ahlgrim-Delzell, Flowers, and Baker evaluated the effectiveness of the *Early Literacy Skills Builder* (ELSB), a multicomponent curriculum that incorporates phonics and phonemic awareness, on literacy outcomes for students with SID. A total of 93 students participated the study and were randomly assigned to one of two instructional groups- ELSB or sight words. Results of this study indicated students taught using the ELSB curriculum made significant gains on their mean literacy scores. Specifically, the mean effect size on the measure of literacy comprehension was moderate at 0.49.

Shared reading, graphic organizers, and system of least intrusive prompts. Mims, Hudson, and Browder (2012) investigated the effects of a modified system of least intrusive prompts on listening comprehension during read alouds for middle school students with autism and SID. Researchers used graphic organizers to help students organize their responses to sequencing questions (i.e., first, second, last) and to help them

answer “WH” questions (i.e., who, what, where, when, and why). Results of their study indicated each student increased their correct, unprompted responses to the listening comprehension questions across five biographies.

Shared reading, task analysis, system of least intrusive prompts. In 2007, Browder, Trela, and Jimenez trained teachers to follow a task analysis while reading grade appropriate literature to six students with moderate and severe developmental disabilities. Using a single subject multiple-probe across participants’ design, researchers measured the effects of the literacy training, teachers’ ability to deliver literacy instruction, and effects on students’ listening comprehension outcomes. Results of this study confirmed all students increased their independent responses on the listening comprehension questions from baseline to intervention.

Browder, Mims, Spooner, Ahlgrim-Delzell, and Lee (2008) taught elementary students with multiple disabilities to participate in shared stories. In their study, researchers taught teachers to plan and implement shared stories that incorporated task analytic instruction and team planning using the principles of UDL. Results of this single subject, multiple-probe across participants’ design indicated all students increased their independent responses to listening comprehension questions.

Using a single subject research design, Browder, Lee, and Mims (2011) investigated the effects of a scripted task analytic lessons and systematic prompting on engagement and listening comprehension for students with multiple, severe disabilities. Three elementary students participated in the study and all were diagnosed with SID and severe physical or sensory impairments. Different from previous studies, Browder et al.

(2011) incorporated three individualized response modes to meet the unique needs for the students, which included an eye gaze, point response, and object response. Results of this study indicated each student increased his or her correct responses to the listening comprehension questions.

Shurr and Taber-Doughty (2012) combined visual supports and discussions during shared reading in order to investigate changes in comprehension for middle school students with a moderate intellectual disability. In their study, researchers used age appropriate text from the SRA Specific Skills Series: Getting the Main Idea and after reading the text, students answered five, three-option multiple-choice questions. Results of this single subject, multiple-probe study confirmed each student increased his or her ability to correctly answer literal, listening comprehension questions from baseline to intervention.

Mucchetti (2013) investigated the effects of shared reading on engagement and comprehension for students with autism, SID, and limited verbal skills. The materials used during shared reading included visual supports (i.e., picture symbols), three-dimensional objects (e.g., a miniature book was attached to the adapted text to represent the library), and simplified text (i.e., researcher reduced the reading level). Results indicated each student improved his or her ability to answer listening comprehension questions and the intervention had a large effect as measured by PND (i.e., 100%).

Spooner, Ahlgrim-Delzell, Kemp-Inman, and Wood (2014) used an iPad2® and systematic instruction during shared stores to teach literacy to elementary aged students with Autism. Results of this study indicated that the three students who met inclusion

criteria (i.e., autism and SID) increased their independent, correct responses to listening comprehension questions from baseline to intervention and across four books.

Combining Four Approaches During Comprehension Instruction

Shared reading, graphic organizer, task analysis, and system of least intrusive prompts. Finally, in 2015, Wood, Browder, and Flynn used a modified system of least intrusive prompts, a graphic organizer, and a task analysis during shared reading for three middle school students with moderate intellectual disability. In their study, Wood et al. (2015) taught students to generate questions using the graphic organizer and asked them to answer researcher-generated literal comprehension questions. Results indicated all three participants increased their ability to generate questions and answer listening comprehension questions from baseline to intervention and from intervention to maintenance.

Results for Cheek et al. (under review) review confirmed researchers are investigating comprehension instruction for students with SID, and in their investigations, researchers were using single subject research designs, combining approaches, adapting the instructional materials (e.g., text) and response modes, and teaching comprehension using a variety of text genres. From this review, results indicated that studies in which researchers combined shared reading, task analysis, and system of least intrusive prompts yielded better results for students' comprehension outcomes. Specifically, when researchers used this combination, students' demonstrated an immediate response to the intervention and maintained a positive, increasing trend in their independent, correct responses to comprehension questions. These results were not surprising because shared

reading, task analysis, and the system of least intrusive prompts are evidence-based practices for teaching students with SID. Also, by adapting the instructional materials and response modes for students with SID, researchers designed interventions that met the unique learning needs of these students. Results of Cheek et al.'s (under review) literature review add to the dearth of literature in comprehension strategy instruction, which is recognized as important in teaching students with and without disabilities to understand text (e.g., Berkeley et al., 2010; NRP, 2000).

Use of Evidence Based Practices during Classroom Instruction

Applying effective strategies promotes student progress, but implementation of these strategies may vary because of teachers' education, experience, and background (see Browder & Spooner, 2011). Additionally, teachers may acquire knowledge of new strategies through published resources, professional development, and trial and error. On a positive note, results of Cheek et al. (under review) confirmed researchers primarily used questioning answering as a way to teach and assess students' listening comprehension, which has been proven effective for students without disabilities (NRP, 2000) and those with high-incidence disabilities (Berkeley et al., 2010). However, in many of the studies, the interventionist was a researcher, which meant the general or special education teacher was denied the opportunity to learn and use the evidence-based practices during classroom instruction. Since teachers, general and special, typically provide comprehension instruction for students with SID, it is vital that they have the

opportunity to learn this content. Effective professional development may be a means for improving teachers' use of evidence-based comprehension strategies during comprehension instruction for students with SID.

Theoretical Framework for Improving Professional Development in Comprehension Instruction for Students with SID

As teachers shift from providing literacy instruction that focuses primarily on sight words to focusing on teaching students to comprehend text, they must be mindful of effective instructional practices needed to provide effective comprehension instruction. Through transformative learning, Mezirow (2003) concentrated on the internal transformation of one's ability to examine, question, validate, and revise his or her meaning perspectives (i.e., sets expectations based on past experiences; Cranton, 1994). Of Mezirow's (1990) three types of meaning perspectives (i.e., epistemic, sociolinguistic, and psychological), the epistemic meaning perspective is most relevant to professional development.

The epistemic meaning perspective relates to knowledge or the use of knowledge (Cranton, 1994). For example, in-service teachers may use knowledge of comprehension instruction grained through professional development in their classrooms. The major premise is that when individuals acquire and use new knowledge one or more transformative outcomes cognitive (complex thinking), personal (tolerance and confidence), or behavioral (resilient) result.

Based on the professional literature, it appears professional development for teachers of students with SID may not be adequately providing teachers with the

knowledge (i.e., epistemic meaning perspective) needed to effectively teach comprehension. This may be the case because previous instruction primarily focused on sight words and the literature provides little guidance on how to teach comprehension to this population. Pedagogical reasons may include the individuality of students with SID, their unique learning needs, and teachers' ability to meet those needs during comprehension instruction. Therefore, teacher educators should focus on providing teachers with opportunities for transforming faulty comprehension instruction into evidence-based comprehension instruction through effective professional development.

Effective Professional Development

Critical Features of Effective Professional Development

As mentioned in Chapter I, in their seminal work, Joyce and Showers (1982) identified four important components of professional development. First is the study of theory or the skill. Second, is the modeling or demonstration of the skill that was studied. Third, is the opportunity for teachers to practice the skill in simulated and classroom settings with feedback (i.e., coaching). Fourth, is peer or group coaching of the skill to encourage continued use and to foster collaborative problem-solving.

More recently, Desimone (2009) posited that there was a consensus among researchers regarding the main features of professional development that were associated with changes in teacher knowledge, teacher practice, and student achievement. Desimone (2009) identified critical features of effective professional development, which include (a) content focus, (b) active learning, (c) coherence, (d) duration, and (e) collective participation. Desimone (2009) stated that the first critical feature, content

focus, was the most influential. Content focus related to the link between subject matter focused activities that increased teachers' knowledge, skills, and abilities; how students learned content; and the impact on student achievement. The second component of active learning was characterized as observing expert teachers, reviewing student work, or leading discussions. Third, coherence referred to the extent to which teachers' learning was consistent with teachers' knowledge and beliefs. Fourth, Desimone (2009) stated that the duration of professional development should include 20 hours or more of contact over time. Finally, collective participation of teachers who participated in the professional development should include opportunities for interaction and discourse.

From these critical features, Desimone (2009) developed a framework for studying the effects of professional development. In essence, the five critical features of professional development (i.e., content focus, active learning, coherence, duration, and collective participation) would lead to increased teacher knowledge and skills. Based on teachers' increased knowledge and skills, they would change their instruction, and this would lead to improved student learning.

When shifting the focus to special education, little is known about how teacher educators and staff developers are addressing the needs of special educators through professional development (Leko & Brownell, 2009). In their article, which focused on professional development for special educators, Leko and Brownell (2009) found similar features of professional development noted in the literature. Specifically, they noted professional development for special educators should be coherent, content-focused, active, situated in the classroom environment, collaborative, and include student data.

Other features of professional development for special educators were also noted. Among these features included highlighting the most effective strategies to use during instruction for students with disabilities, involving experts in the field, following up with teachers, and providing feedback on their instruction (Leko & Brownell, 2009).

Taken together, the critical features described in Desimone (2009) and in Leko and Brownell (2009) align with the four critical features described in Joyce and Showers (1982). The first critical feature discussed in Joyce and Showers (1982) was the study of theory or the skill, which should be content-focused (Desimone, 2009; Leko & Brownell, 2009) and highlight effective strategies (Leko & Brownell, 2009). For example, teachers may learn how to use the CAR and CROWD during shared reading for students with SID. The second feature, observation of the skill that was studied, should be an active process in which teachers observe other teachers using best practices in the classrooms, on-site or online (Desimone, 2009; Leko & Brownell, 2009). For example, observation of the skill may occur online, through an online module that includes videos of teachers using the CAR and CROWD. The third feature involved teachers practicing the skills in their classroom and receiving feedback (i.e., coaching). The feedback should be coherent and individualized based on teacher's knowledge (Desimone, 2009; Leko & Brownell, 2009). The feedback may also be situated in the classroom setting (Leko & Brownell, 2009). For example, teachers may use the CAR and CROWD during shared reading for students with SID, while a coach provides feedback. Additionally, by completing the first three components outlined in Joyce and Showers (1982) the duration of the professional development may last more than 20 hours (Desimone, 2009), which

provides ample time for follow up and student data collection (Leko & Brownell, 2009). The fourth and final component of Joyce and Showers (1982) was group coaching and this format provides opportunities for interaction and discourse (Desimone, 2009). When these critical features are aligned, teachers learn new knowledge and as a result, are able to transform their classroom instruction.

Problems with Contemporary Approaches to Professional Development

Unfortunately, problems exist with contemporary approaches to professional development. As stated previously, professional development typically occurs outside of the classroom environment and infrequently aligns with ongoing teacher practice (Loucks-Horseley & Matsumoto, 1999). According to Hargreaves (2007) professional development is usually provided in order to achieve short-term goals, is delivered by experts, and is not developed in a way that promotes transfer and fosters teachers' interdependence and critical thinking skills. In other words, traditional professional development can be described as piecemeal, ineffective, and costly, often failing to reflect the critical features of effective professional development (i.e., Desimone, 2009; Joyce & Showers, 1982; Leko & Brownell, 2009).

Online Professional Development

Despite the aforementioned shortcomings associated with professional development, traditional workshops offer one example of how a teacher can gain new knowledge, such as how to use the CAR and CROWD during comprehension instruction for students with SID. An alternative way to help teachers learn how to use these strategies during instruction is by providing professional development through an online

module. Specifically, the content presented in the online module can be designed to help build teachers' knowledge of the CAR and CROWD prior to using them during literacy instruction.

When developing and providing professional development online, professionals should adhere to the guiding principles for multimedia instruction (Mayer, 2014). In general, these principles (i.e., coherence, signaling, redundancy, special contiguity, temporal contiguity, segmenting, pre-training, choice of modality, personalization, voice, embodiment, and image) enable learners to learn the information that is relevant to them in digestible chunks, thereby increasing the likelihood that learners will use the information in their instruction.

Additionally, since knowledge precedes transfer, the content delivered through the online module should reflect the first two components of Joyce and Showers (1982)- the study of theory or the skill (i.e., CAR and CROWD) and observation of the skill (i.e., online videos of teachers using the CAR and CROWD). In the following section, coaching, which has been proven to help with knowledge transfer (Joyce & Showers, 2002) and is the third component of effective professional development (Joyce & Showers, 1982), will be discussed.

Coaching as Professional Development

Coaching occurs when an individual, such as a university supervisor or peer, provides individualized support to teachers (see Kretlow & Bartholomew, 2010). Coaching is used to support teachers as they begin to implement new behaviors and skills in the classroom, and to encourage their continued use (Joyce & Showers, 1995). When

providing coaching, the coach creates a "psychologically safe environment where it is all right to experiment, fail, revise, and try again" (Raney & Robbins, 1989, p. 37), which encourages transfer and continued use because coaching occurs in the environment in which instruction typically occurs (i.e., during comprehension instruction).

Supervisory coaching (Joyce & Showers, 1995) and side-by-side coaching (Blakely, 2001) are the two primary coaching models discussed in the professional development literature. The first model, supervisory coaching, occurs when the coach observes the teacher implementing a technique learned during training and follows up with the teacher after the lesson (Kretlow & Bartholomew, 2010). During the lesson the coach will take notes about the teachers' use of the new skills, but the teacher will not receive descriptive and constructive feedback until after the lesson. The second model, side-by-side coaching, occurs when the coach is in the classroom, intervenes during the lesson, and provides a model and rationale for changes. Although during side-by-side coaching the teacher can receive immediate, in vivo feedback, this method requires the coach to be onsite an in the classroom.

Researchers indicate that supervisory coaching coupled with traditional professional development improves teaching accuracy (Fuchs, Fuchs, Hamlett, & Ferguson, 1992). Additionally, side-by-side coaching increases the skill acquisition rate of teachers using (i.e., transferring) newly learned knowledge and skills (Kretlow, Wood, & Cook, 2011). However, typically, supervisory and side-by-side coaching required the coach to be onsite and in the classroom, which may have disrupted the classroom structure.

Professional Development and Coaching during Literacy Instruction

Neuman and Cunningham (2009) investigated the impact of professional development and coaching on early language and literacy instructional practices. Participants were from 297 sites (i.e., centers and home-based) and were randomly assigned to one of 3 groups. Group 1 took a 3-credit hour course in early language and literacy, Group 2 took the course and received ongoing coaching, and Group 3 was the control group. The language and literacy course took place at a community college, and was designed to provide knowledge considered to be essential for quality language and literacy. Content included oral language comprehension, phonological awareness, letter knowledge and the alphabetic principle, print convention, strategies for working with ELLs, literacy assessments, parental role in early language and literacy development, and linkages between literacy and other aspects of the curriculum. Participants spent two weeks on each topic. The coaching intervention occurred onsite and focused on helping participants apply research-based strategies to improve child language and literacy outcomes. Results indicated there were statistically significant improvements in language and literacy practices for teachers in Group 2 who received the professional development and coaching. Specifically, researchers calculated Cohen's d and found an effect size of 0.20 for the home-based setting and an effect size of 0.03 for the center based setting. In this study, coaching was delivered online and not through advanced online technology; however, results indicated traditional professional development plus coaching matters, especially in the area of literacy.

Virtual Coaching through Advanced Bug-in-Ear (BIE) Technology

Recently, advances in technology have enabled teachers to receive coaching in situ. Coaching can now occur online through *e*Coaching with advanced Bug-In-Ear (BIE) technology. As defined in Chapter I, *e*Coaching or a "relationship in which one or more persons' effective teaching skills are intentionally and potentially enhanced through online or electronic interactions with another person" (Rock et al., 2014, p. 162), does not require the expert to be onsite in order to deliver feedback. Not only does *e*Coaching through advanced BIE enable the coach to communicate discreetly with teachers while they are actively engaged in teaching students, but also it eliminates the distraction of having another adult in the classroom, and enables the coach to deliver real time, immediate feedback which may be more effective (Scheeler, Ruhl, & McAfee, 2004) than feedback that is delayed more than 24 hours (Solomon, Klein, & Politylo, 2012). Although the work in this area is emerging, results are promising, and researchers have demonstrated that *e*Coaching can be used to help teachers transfer their new knowledge and skills into classroom practice.

To date, research on *e*Coaching through BIE for teachers (in-service and preservice) has been limited. In 2009, Rock and colleagues conducted the first of three studies investigating the effects of coaching delivered through advanced, online technology and the effects on teachers' use of evidence based practices. Participants included 15, special education and general education teachers who were earning their masters degree through a federally funded personnel preparation program. Years of experienced ranged one year to 20 years, with a mean of 5.4 years. The first author, who

was also their university professor, provided *e*Coaching through BIE, which included a Bluetooth headset, Skype, and a web camera. Using a mixed methods sequential explanatory design, researchers examined the changes in teacher behavior (i.e., high access and low access instructional practices), classroom climate (i.e., teacher redirects, reprimands, and praise; student engagement), level of disruption, and benefits of BIE. Quantitative and qualitative results indicated the advanced online BIE was a practical and efficient way to provide immediate feedback to teachers. As a result, teachers increased their use of evidence based instructional and behavioral practices and student's increased their time on-task (i.e. engagement). Specifically, results of the matched-paired t-tests revealed statistically reliable reductions in the number of hand raisings ($t(14) = 4.58$, $p = .0005$, $\alpha_{\text{one-tailed}} < .016$, $\Delta = 0.99$); statistically reliable reductions in the number of verbal and nonverbal choral responses ($t(14) = -2.509$, $p = .0005$, $\alpha_{\text{one-tailed}} < .0125$, $\Delta = 1.09$); statistically reliable differences between the mean number of partner strategies ($t(14) = -2.856$, $p = .0065$, $\alpha_{\text{one-tailed}} < .016$, $\Delta = 0.75$); statistically reliable differences between the mean number of close reading practices ($t(14) = -3.829$, $p = .001$, $\alpha_{\text{one-tailed}} < .016$, $\Delta = 1.00$); and a statistically reliable increase in students' engagement ($t(14) = -3.996$, $p = .001$, $\alpha_{\text{one-tailed}} < .016$, $\Delta = 1.40$).

In 2012, Rock and colleagues conducted a follow-up study to validate the findings from Rock et al. (2009) with the purpose of extending the previous study with a new group of in-service teachers. Participants in this study included 13 certified, practicing teachers who were enrolled in a federally funded master's level personnel preparation

program in special education. All participants were elementary teachers (i.e., kindergarten through 6th grade) and years of experience ranged from one to 13 years, with a mean of 5 years.

The *e*Coaching intervention used in Rock et al. (2012) was the same intervention used in Rock et al. (2009). Again, the first author, who was also the university supervisor, provided the *e*Coaching through BIE technology. Similar to Rock et al. (2009), researchers were interested in improving participants' research-based practices (i.e., high and low access instructional strategies, praise, reprimands, and redirects), but the coach also provided instructing, correcting, encouraging, or questioning feedback. Results of this mixed method explanatory design indicated positive changes in teacher's behavior, which included a decrease in teachers' use of low access strategies (1.27 effect size) and increases in teachers' use of high access strategies (0.83 effect size) and praise (1.20 effect size). Overall, findings from Rock et al. (2012) supported findings from Rock et al. (2009).

That same year, Scheeler, McKinnon, and Stout (2012) examined the effects of immediate feedback delivered through a web camera and BIE technology on preservice teachers' performance. Researchers conducted a multiple baseline across participants designed to examine the percentage of three-term contingency trials (TTC)- learning units that consisted of an antecedent, student response, and teacher feedback (Scheeler et al., 2012). During the intervention, the *e*Coaching sessions lasted approximately 15 minutes, and the researcher provided immediate verbal feedback to help teachers complete the TTC through BIE. Results indicated that when feedback was delivered

through a web camera and BIE, all five participants increased their completion of TTC trials. Additionally, results of this study further supported the use of BIE and *e*Coaching to improve teacher behavior.

In the third, and most recent study, Rock and colleagues (2014) examined the longer-term effects of *e*Coaching through advanced BIE technology- after *e*Coaching was no longer provided. The 14 participants in this study were the same as those in Rock et al. (2009); however, one dropped out due to personal reasons. Through a mixed methods exploratory research design, researchers extracted data from electronically archived video files. By viewing the instructional practices used by the participants at three specific points in time, Spring 1 (baseline), Spring 2 (after 1 year of *e*Coaching), and Spring 3 (2 years later after graduating from the program), researchers examined changes in teachers' behavior, classroom climate, participants' perceptions, and student engagement and responsiveness. Results indicated that teachers increased their use of high access instructional practice and praise, and as a result, students became more engaged during the lessons. Specifically, the differences in the means at the three points in time for high access instructional practices were statistically significant, $F(2, 12) = 33.82$, $p = .0001$, with an effect size of .85 and power of 1.00, and the test of linear trend was also statistically significant, $F(1, 13) = 73.01$, with an effect size of .85 and power of 1.00. Statistically significant mean differences for praise were also found, $F(2, 12) = 18.95$, $p = .0001$, with an effect size of .76 and power of .99, and the quadratic trend was statistically significant, $F(1, 13) = 12.61$, $p = .004$, with an effect size of .49 and power of .90. Finally, mean differences were statistically significant for student engagement, $F(2, 12) =$

13.88, p = .001, with an effect size of .70 and power of .99, and the test of linear trend was also statistically significant, $F(1, 13) = 17.95$, p = .001, with an effect size of .58 and power of .97. Not only did findings of Rock et al. (2014) support findings from Rock et al. (2009, 2012), but they also validated the use of *e*Coaching through BIE over time.

In the same year, Ploessl and Rock (2014) used a single subject withdrawal (ABAB) within participants' research design to investigate the effects of *e*Coaching on co-teacher's planning and instruction. Specifically, researchers were interested in how co-teaching partners planned and implemented co-teaching models; the number, type, and amount of student-specific accommodations that were planned and implemented; and the type of positive behavioral supports and interventions teachers included in their lessons. All teacher participants taught in public elementary schools and in inclusive classrooms, which included pre-kindergarten through 5th grade.

In their study, Ploessl and Rock (2014) used the *e*Coaching system developed by Rock and colleagues (2009). During the *e*Coaching intervention, the first author provided encouraging, correcting, questioning, or instructive feedback via the advanced online BIE and during the cooperative co-planning session. *e*Coaching continued for four sessions and lasted about 30 minutes each. Results confirmed each co-teaching dyad increased the number and type of co-teaching models they planned to use and implemented those models during the lesson. Results of this study also indicated that *e*Coaching through advanced online BIE was effective during co-teaching with general and special educators alternating days in which they used the Bluetooth to receive discreet, immediate feedback, during classroom instruction.

Finally, Coogle, Rahn, and Ottley (2015) investigated the impact of immediate feedback delivered through BIE on early childhood special education preservice teachers' use of communication strategies during leisure activities. Three, early childhood preservice teachers who were enrolled in a 15-week teaching internship participated in this study, and researchers used a single subject, multiple-probe across participants' design. *e*Coaching occurred during small group activities (e.g., sand table) and preservice teachers were instructed to use communication strategies (i.e., choice making, in sight out of reach, sabotage, and wait time) with students with and without disabilities. Results indicated that preservice teachers increased their communication strategy use and demonstrated a strong effect that ranged from 86%-100% for percentage of all non-overlapping data (PAND), robust improvement rate difference (IRD), and the omnibus test.

In the studies above, the duration of the *e*Coaching sessions varied, but generally lasted approximately 15-30 minutes. In Rock et al., (2009), *e*Coaching occurred during whole group reading instruction, but in Rock et al., (2012, 2014), the content, format, and classroom locations for *e*Coaching varied. Ploessl and Rock (2014) stated *e*Coaching occurred in inclusion classrooms, but content area was not provided, and Coogle et al. (2015) conducted their study during small group activities. The focus of *e*Coaching in all three studies centered around teachers' use of evidence-based instructional practices that could be used across all content areas, but researches did not focus on providing *e*Coaching that would encourage teachers to used targeted instructional practices in one content area (i.e., comprehension), nor did they include student participants with SID.

Transforming Professional Development for Teachers

In order to transform professional development for teachers who provide comprehension instruction to students with SID, professional development must be designed in accordance with the critical features of effective professional development (Joyce & Showers, 1982; Desimone, 2009; Leko & Brownell, 2009). Additionally, *e*Coaching should be included because it has been proven to encourage teachers' prolonged use of new skills over time (e.g., Rock et al., 2014). Therefore, in this study, the research combined professional development with *e*Coaching to help teachers learn how to use the CAR and CROWD during comprehension instruction for students with SID.

To do this, in this dissertation study the researcher designed the professional development according to the four components of professional development discussed in Joyce and Showers (1982). Specifically, the online module addressed the first two components and the *e*Coaching addressed the third. Teacher participants learned about the CAR and CROWD by completing an online module (i.e., study of theory or the skill). The online module reflected the 12 principles for multimedia learning (Mayer, 2014) and also included videos of teachers using the CAR and CROWD with students with SID (i.e., observation of the skill). Finally, Teacher Participants used the skill during their literacy instruction and received feedback (i.e., *e*Coaching).

Summary

In this systematic review and examination of peer-reviewed publications relevant to the purposes of this study, evidence has been provided to support the need for increased research on comprehension instruction for students with SID and to investigate ways for teachers to acquire and use this knowledge. Research on comprehension for students confirmed that investigators primarily used question answering to teach and assess students' comprehension. Additionally, investigators combined approaches during comprehension instruction to meet the unique learning needs of students with SID. What is missing from the current professional literature base is research examining the use of evidence-based comprehension strategies during comprehension instruction for this population. This is not surprising given the limited amount of studies available investigating comprehension instruction (Cheek et al., under review). What is known is that comprehension strategy instruction helps students with and without disabilities learn to comprehend text (e.g., Berkeley et al., 2010; NRP, 2000), but opportunities for teachers to learn these strategies through professional development are limited and may not meet the needs of special education teachers (Leko & Brownell, 2009).

Comprehension strategy instruction is important and teachers need opportunities to learn how to incorporate these strategies into comprehension instruction. One way to facilitate teachers' knowledge acquisition is through professional development. Although several researchers (i.e., Desimone, 2009; Joyce & Showers, 1982; Leko & Brownell, 2009) have discussed the critical features of effective professional development, current approaches have proven effective (see Hargreaves, 2007). One solution to the problems

associated with the contemporary, ineffective approaches to professional development may be job-embedded professional development, presented through an online module, plus *e*Coaching. As previously mentioned, job-embedded professional development is learning that is grounded in day-to-day teaching practice and occurs regularly (see Cogshall et al., 2012), and by enabling teachers access this knowledge online, it becomes more easily accessible. Additionally, *e*Coaching provides teachers immediate feedback and limits distractibility in the classroom, which may potentially increase the likelihood that practicing teachers will transfer the knowledge of comprehension instruction (i.e., CAR and CROWD) learned in the online module to the classroom with fidelity and over time.

Addressing the gaps and in the professional literature base on comprehension instruction for students with SID could produce a foundation upon which in-service teachers transform their comprehension instruction for students with SID. As a result, the online module coupled with *e*Coaching may not only lead to improved knowledge and transfer, but also improve listening comprehension outcomes for students with SID.

CHAPTER III

METHODOLOGY

The purpose of this study was to investigate the effects of job-embedded professional development (i.e., online module + *e*Coaching) on in-service teachers as they provided comprehension instruction to students with SID. This chapter includes a description of the research design, participant recruitment, independent and dependent variables, data collection procedures, and data analysis.

Single Subject Research Design (SSRD) in Special Education

Research in special education often involves smaller populations of students with disabilities that have a low prevalence (Odom et al., 2005), such as students with SID. Other methodologies (e.g., group experimental) that require a large number of participants for power and analysis may not be feasible when conducting research in special education– as is often the case when including participants with low incidence disabilities. Single subject research design (SSRD) enables investigators to conduct experiments including a small number of participants because each participant acts as his or her own experimental control (Vannest, Davis, & Parker, 2013). Additionally, SSRD analysis enables investigators to immediately determine the effects of the intervention through visual analysis (Gast, 2010; Tankersley, Harjusola-Webb, & Landrum, 2008).

In this dissertation study, the researcher adhered to the quality standards for SSRD developed by Horner et al. (2005) and Kratochwill et al. (2010). Specifically, the

researcher designed the study using the quality indicators described in Horner et al. (2005) for an "Acceptable" rating. Also, the researcher adhered to the *What Works Clearing House* (WWC) quality standards for strong evidence of a causal relation in order to "Meet Evidence Standards."

Research Design

In this dissertation study, the researcher used a single subject, multiple-baseline across participants' design (Gast, 2010; Kazdin, 2010; Kratochwill et al., 2010) to investigate the effects of an online module plus *e*Coaching on teachers' use of the CAR and CROWD during shared reading for students with SID and the impact on students' listening comprehension. This multiple-baseline across participants' design required four conditions or phases- baseline, intervention, maintenance, and generalization (Kratochwill et al., 2010). See Table 1 for visual representation of the phases.

To implement this research design, the researcher collected data across each condition or phase continuously. Participants entered the intervention phase at different times (i.e., stair-step or staggered entry). According to Gast (2010), the criterion for intervention can be a set number of days. Therefore, Teacher Participant 1 entered the intervention phase after five consecutive days, Teacher Participant 2 entered after 10 days, and Teacher Participant 3 entered after 15 days, and until all participants entered the intervention. More details are provided in the procedures.

1. During Phase 1 (baseline), sessions were conducted for all Teacher Participants as controls before the intervention (i.e., online module + *e*Coaching) began (Gast, 2010).

2. During Phase 2 (intervention), the intervention (i.e., online module + *e*Coaching) was introduced to each Teacher Participant and was compared to the baseline condition. Additionally, each Teacher Participant taught their literacy lessons and received *e*Coaching.

3. In Phase 3 (maintenance), the Teacher Participants taught their literacy lessons, but no additional module training or *e*Coaching was provided.

4. In the final phase of the study, Phase 4 (generalization), Teacher Participants taught their literacy lessons using a different type of text (i.e., narrative and expository). Again, no additional module training or *e*Coaching was provided.

Additional details for each phase are described in the procedures section of this chapter.

As noted previously, when using multiple-baseline SSRDs, each participant acts as his or her own experimental control (Vannest, Davis, & Parker, 2013). Therefore, in order to assess baseline stability, the stability envelope will be calculated; meaning 80% of the data points in baseline fall within a 20% range of the median level (mean) of all data-point values of this condition (Gast, 2010).

Table 1. Single Subject, Multiple-baseline across Participants Design Phase Chart

Phase	Procedures	Data Collection	Decision Rule
Baseline	• Observe Teacher Participants and student participants during literacy lesson with narrative storybook • Provide no online module + *e*Coaching • Record lessons • Secure data	• Dependent variables (Teacher Participants and Student Participants) • *e*Coaching fidelity • Teacher fidelity	Obtain 5 data points Stable data rate (i.e., absence of trend, little variability)
Intervention	• Teacher Participants complete online training module via Wikispaces • Observe Teacher Participants and Student Participants during literacy lesson with narrative storybook • Provide online module + *e*Coaching • Record lessons • Secure data	• Dependent variables (Teacher Participants and student participants) • *e*Coaching fidelity • Teacher fidelity	Obtain 5 data points Stable data rate (i.e., absence of trend, little variability)
Maintenance	• Observe Teacher Participants and Student Participants during literacy lesson with narrative storybook • Provide no online module + *e*Coaching • Record lessons • Secure data	• Dependent variables (Teacher Participants and Student Participants) • *e*Coaching fidelity • Teacher fidelity	Obtain 5 data points Stable data rate (i.e., absence of trend, little variability)

Generalization	• Observe Teacher Participants and Student Participants during literacy lesson using expository text • Provide no online module + *e*Coaching • Record lessons • Secure data	• Dependent variables (Teacher Participants and Student Participants) • *e*Coaching fidelity • Teacher fidelity	Obtain 5 data points Stable data rate (i.e., absence of trend, little variability)

Note. Research design phase chart.

Research Design Considerations: Multiple-Baseline Across Participants

When determining SSRD, the researcher considered the characteristics of adult learners and determined a multiple-baseline across participants' design would be the appropriate research design for this study. First, in this multiple-baseline across participants' design, although Teacher Participants entered the intervention phase at different times, they all began the study at the same time. This may have potentially eliminated anxiety in teacher participants. Second, with a multiple-baseline across participants' design, the effectiveness of the independent variable (i.e., online module + *e*Coaching) was evaluated based on the impact of the same dependent measures, which are discussed below.

Additionally, a multiple-baseline SSRD was appropriate to use in this study because examining comprehension instruction for students with SID has become the focus of instruction. Additionally, and as mentioned previously, the CAR and CROWD have not been coupled in an intervention, have not been used during comprehension instruction, and have not been used with students with SID.

Research Questions and Hypothesis

As stated in Chapter 1, the researcher investigated following research questions:

1. How does the online module plus *e*Coaching affect teachers' implementation of the CAR and CROWD, as evidenced by OTR, during shared reading for students with SID?

2. In what ways does the online module plus *e*Coaching impact the amount and variety of questions asked during comprehension instruction when teachers use the CAR and CROWD during shared reading for students with SID?

3. How does teachers' use of the CAR and CROWD impact listening comprehension outcomes for students with SID (i.e., frequency and accuracy of responses)?

4. How does teachers' use of the CAR and CROWD impact students with SID engagement during shared reading?

The researcher hypothesized that when provided an online module plus *e*Coaching, for the CAR and CROWD during shared reading, teachers would increase the amount and variety of comprehension questions asked, students with SID would become more engaged and would correctly answer more listening comprehension questions.

Participants

Teacher Participants

Three special education teachers were recruited and participated in this study. All of the teachers were special education teachers who provided literacy instruction elementary-aged students with SID and autism. Teacher Participant 1 was a 25-year old,

Caucasian female, who taught in an elementary K-2 classroom. She had a Bachelor of Arts Degree in Psychology and was credentialed as a Registered Behavioral Technician (RBT). Teacher Participant 2 was a 26-year old, Caucasian female, who taught in an elementary K-2 classroom. She was RBT certified, a Board Certified Behavior Analysist, and had a degree in Business Administration. Teacher Participant 3 was a 33-year old Caucasian female, who taught in an elementary readiness classroom for students ages six to 12. She was certified in Georgia, but that license has recently expired. Years of experience for the Teacher Participants ranged from three to eight years and each teacher provided literacy instruction daily.

Student Participants

Three students with SID and autism participant in this study. Student Participant 1 was a 9-year old Caucasian male diagnosed with SID, autism, cerebral palsy (CP) and hearing loss. He communicated primarily through the use of short (2-3 word) phrases when and used a picture exchange communication system (PECS). Student Participant 2 was a 7-year old Caucasian female, with SID, autism, developmental delays, and speech delays. She communicated primarily through scripting and short phrases. Student Participant 3 was a 9-year old Caucasian male diagnosed with SID, autism, and attention deficit hyperactivity disorder (ADHD). He had difficulty verbalizing his wants and needs, communicated primarily through scripting, but used short phrases when given teacher prompting. See Table 2 for additional student characteristics.

Table 2. Student Demographics

Student	Ethnicity	Age/Gender	Disability	Current Literacy Level	Literacy Goal (s)
Student Participant 1	Caucasian	9, male	SID, autism, cerebral palsy (CP), and hearing loss	• Attends to story/pictures with prompts • Does not read or recognize words other than own name.	• Receptively or expressively identify 26 letters • Match 5 words to pictures
Student Participant 2	Caucasian	7, female	SID, autism, developmental and speech delays	• Recognizes letters • Currently learning the phonetic sounds of each letter • Recognizes name • Sometimes attends to text in short spans with prompting	• Expressively identify the phonetic sounds of each letter
Student Participant 3	Caucasian	9, male	SID, autism, and attention deficit hyperactivity disorder (ADHD)	• Recognizes sight words • Reads on 1st grade level on an instructional level. • Below grade level for comprehension	• Sit and attend to a story for fifteen minutes

Note. Student Participant Demographics

Selection Process

The researcher used purposeful sampling for this study (Gall et al., 2007). Since the unit of analysis was teachers' use of the CAR and CROWD, the researcher selected a

purposeful sample of teachers who will be more likely to be "information-rich with respect to the purposes of this study" (Gall et al., 2007, p. 178). For example, Teacher Participants provided comprehension instruction and which enabled the researcher to obtain rich information about the use of the CAR and CROWD during their instruction and the impact on student participants' listening comprehension and engagement. Additionally, the researcher selected a sample of convenience. Student participants must have been diagnosed with SID or SID and autism; therefore, the researcher and the school's senior program advisor identified teachers who have students with SID or SID and autism in the classrooms who met the criteria described above. Also, convenience sampling was used because the researcher was familiar with the research site, which was in close proximity to the researcher's home should problems arise.

The researcher collaborated with the lead teacher at the study site, and the lead teacher identified potential teachers the met the aforementioned criteria. Once potential Teacher Participants were identified, the lead teacher identified potential students that met inclusion criteria. The researcher recruited Student Participants from the identified potential Teacher Participants and consent forms and student assent forms were given to the teachers. Of the three Teacher Participants that provided consent, one Student Participant from each classroom provided assent and parental consent for participant in the study.

Setting

This dissertation study took place in a private, separate school in the Southeast that provides individualized diagnostic, therapeutic, and educational services to 335

children diagnosed with autism, intellectual disabilities, and other developmental disabilities. Each classroom in the school was labeled a self-contained classroom and each student applied and was accepted prior to admission to the school. The school includes 32 teachers, and a myriad of teacher's assistants, volunteers, and student interns.

Literacy lessons occurred in the Teacher Participants classrooms. Due to technology issues in the school, in the beginning of the study Teacher Participants 1 and 2 conducted their sessions in the same classrooms at different times of the day, and Teacher Participant 3 conducted her sessions in her classroom. However, by the middle of the study all Teacher Participants conducted their lessons in the same classroom (i.e., Teacher Participant 3) because of a loss of the computer in Teacher Participant 2's classroom. Teacher Participants conducted their lessons one-on-one with the target student or in groups of two to five students. The researcher provided *e*Coaching from a private office on campus or in the researcher's home.

Materials

Shared reading is a teaching strategy that encourages student participation, and books are typically read over an extended period of time (Peterson & Swartz, 2008). Therefore, in this study two types of books were used. During baseline, intervention, and maintenance, teachers read storybooks. In storybooks, authors typically combine brief text with illustrations to tell a story (Tompkins, 2010). Additionally, storybooks are available for a wide range of students from preschool to upper-grade levels. During the generalization phase, teachers read an informational or expository text. As stated previously, information texts typically follow a pattern in which the authors provide a

description of a topic; discusses the topic in a chronological order; compares two or more things in the story; lists cause and results, and states a problem and possible solutions (Tompkins, 2010). Similar to storybooks, informational text was available for a wide range of age and reading levels. Another important note is that the school in which the study took place was a private school and therefore does not follow state literacy guidelines. Books chosen for the study were appropriate for the student participant's educational goals.

The researcher selected the books that used in this dissertation study by using a list of books recommended for use in elementary Scholastic books website and paid close attention to reading levels and age recommendations. Teacher Participants each had a copy of the books used during the study. No adapted books were used.

Independent Variable: Online Training Module + *e*Coaching

As mentioned previously, effective professional development should include the following four components: the study of theory of best practice or skill, opportunities to observe the learned skill, opportunities to practice the skill and receive feedback on its use, one-on-one coaching, and group coaching (Joyce & Showers, 1982). However, Joyce & Showers (1982) stated that teachers often struggled when transferring knowledge learned during professional development into their classroom practice (i.e., 0.0 effect size; Joyce & Showers, 1982), but professional development coupled with coaching led to a greater rate of transfer of this knowledge into classroom instruction (i.e., 1.42 effect size). Therefore, the independent variable for this study was professional development, which was delivered through an online module training, plus eCoaching for

the CAR and CROWD. The researcher addressed three out of the four components of effective professional development recommended by Joyce and Showers (1982).

Online Training Module

The 1-hour, self-paced, online module occured online and will be made available to Teacher Participants through a private Wikispace (see Appendix C). The content included in the online module reflected two out of the four components of effective professional development recommended by Joyce and Showers (1982) and the design adhered to Mayer's (2014) 12 principles. First, Teacher Participants studied the skill, which included the importance of literacy for students with SID, shared reading, and the CAR and CROWD. Second, teachers were given opportunities to observe shared reading, the CAR, and CROWD via online videos. Finally, teachers completed an eight question assessment via Survey Monkey on the CAR and CROWD.

***e*Coaching**

During the *e*Coaching sessions, the coach (i.e., researcher) used a modified version of the web-based interactive video conferencing system and advanced online BIE system described in Rock et al. (2009). This system required the use of the Internet technology, mobile communication devices, web camera, and a computer. Specifically, *e*Coaching occurred through Skype and a Plantronics Wireless VoIP USB Headset and sessions lasted for approximately 15 minutes. Since teachers accepted incoming calls through Skype, all *e*Coaching sessions were scheduled in advance; therefore, no observations or *e*Coaching sessions were unannounced.

During *e*Coaching, teachers received a variety of immediate feedback. In their study, Scheeler et al., (2004) stated that immediate feedback may be more effective than delayed feedback (i.e., more than 24 hours; Solomon et al., 2012), and three types of feedback (i.e., instructing/correcting, encouraging, or questioning; Rock et al., 2009; Scheeler et al., 2004) were provided to Teacher Participants as they taught their literacy lessons. Instructing or correcting feedback was defined as "objective information related to predetermined specific teaching behaviors is offered" (Scheeler, et al., 2004, p. 399), encouraging feedback included "praise contingent on demonstration of a specific teaching behavior is provided" (Scheeler, et al., 2004, p. 399), and questioning feedback referred to sentences asked to clarify information about the instruction (Merriam-Webster, 2015). In this study, the *e*Coach focused on three areas in which to provide feedback during the *e*Coaching sessions: (a) teachers' use of the CAR, (b) teacher's use of the CROWD, and (c) students' responses to listening comprehension questions, and (d) student engagement.

Dependent Variables

The researcher collected data on each Teacher Participant's use of the CAR and CROWD. The measure for the Student Participants included engagement and correct, independent responses to listening comprehension questions.

Teacher Dependent Variables

The first dependent variable was the teacher's ability to use the CAR and CROWD during shared reading for students with SID. The researcher provided Teacher Participants with a flow chart (see Appendix D) that provided a visual of the process of

using the CAR and CROWD simultaneously. The second variable was the frequency and type of questions the teacher asks when using the CROWD. The frequency of questions the teacher asks referred to the total amount questions asked during the 20-minute session. The type of questions referred to CROWD (i.e., completion, recall, open-ended, WH, and distancing) and non-CROWD questions. Additionally, questions were categorized and coded as literal, inferential, critical, and evaluative comprehension questions, and higher order or lower order questions.

Student Dependent Variables

The first student dependent variable was student engagement. Student engagement was defined as the "student attending to (i.e., looking at) the teacher, making appropriate motor responses (e.g., following directions, manipulating materials), asking for assistance in an appropriate manner, and interacting with peers or adults within the structure of the activity" (Courtade, Lingo, & Whitney, 2013, p. 9). The second student dependent variable included the number of correct, independent, student responses to Teacher Participant's CROWD, which will be considered his or her independent responses to listening comprehension questions.

Data Collection and Measures

*e*Coaching sessions were recorded using Call Recorder for Mac v.2.5.16 which is offered through Skype. Each video file was saved on a separate hard drive and stored in a locked storage facility approved by the University of North Carolina's (UNCG) Institutional Review Board (IRB). The researcher collected and code frequency data on teacher and student participant dependent variables after the literacy lesson (see Table 2).

Data were collected for all Teacher Participants, but for Student Participants, data were only collected for students who have signed consent forms and have met inclusion criteria (i.e., target student). The dependent variables are described below. See Appendix E for data collection sheets for teacher and student participants.

Teacher Measures

First, to measure Teacher Participant's use of the CAR and CROWD, the researcher collected data on the frequency, type, and variety of questions (i.e., Completion, Recall, Open-ended, WH-, and Distancing) asked during the lesson. To assess the frequency of questions asked using the CROWD, the researcher counted each Teacher Participant question. The researcher also collected data on teacher directed opportunities to respond (OTR), because increased OTR enhances student engagement and correct responses (MacSuga-Gage and Simonsen, 2014). In this dissertation study, OTRs were questions asked with the CROWD. Teacher Participant requests or commands (i.e., touch the Gruffalo), were not coded as OTRs. Additionally, the researcher grouped "cluster questions" (i.e., multiple related questions consecutively) as one OTR. For example, "Where's the Gruffalo" was counted as on OTR, but "Where's the Gruffalo? Where's the mouse going" was counted as two OTRs, because they were two unrelated questions. According to a review of the literature conducted by MacSuga-Gage and Simonsen (2014), researchers recommend providing students three to five opportunities to respond per minute. Since many researchers conducted studies without students with SID, the number of teacher directed opportunities to respond may be slightly lower. Second, to collect data on the type of questions asked (i.e., literal,

inferential, higher order, and lower order), the researcher will collect frequency counts on the question type.

Student Measures

First, to measure student's engagement, the researcher collected data via interval recording during 2-minute intervals (Cooper, Heron, & Heward, 2007). As stated previously, students' engagement was defined as the "student attending to (i.e., looking at) the teacher, making appropriate motor responses (e.g., following directions, manipulating materials), asking for assistance in an appropriate manner, and interacting with peers or adults within the structure of the activity" (Courtade et al., 2013, p. 9). The researcher recorded Student Participant's engagement as occurring (+) if the student is engaged at any time during 2-minute interval (see Cooper et al., 2007).

Second, to measure the impact of Teacher Participant's use of the CAR and CROWD on students' comprehension, the researcher collected data on the type of questions answered by Student Participants and whether they answered the question correctly (Y) or incorrectly (N). Additionally, the teacher collected anecdotal notes on the type of question asked (e.g., literal or inferential) and the type of response mode the teacher used (e.g., picture response cue or object response).

Social Validity

At the end of the study, Teacher Participants completed a social validity questionnaire. See Appendix F for the social validity questionnaire. The purpose of the social validity questionnaire was to assess the overall importance and feasibility of the study (Horner et al., 2005). The researcher created the questionnaire on Qualtrics- an

online platform used to design, develop, and analyze online surveys, and developed the questions based on the quality indicators for single subject research (Horner et al., 2005). The survey included 10, 5-point Likert-type scale questions in which Teacher Participants will indicated their level of satisfaction with the intervention (i.e., training package). Scores on the Likert-type scale range from 1 to 5 with the numbers representing the following: 1 = strongly agree, 2 = agree, 3 = neither disagree or agree, 4= disagree, 5=strongly disagree.

*e*Coaching Fidelity Measures

Sheeler and colleagues (2004) stated that feedback should be more positive versus corrective or questioning. Additionally, Rock et al. (2012) recommended *e*Coaches provide four times (4x) as many encouraging forms of feedback in relation to instructing, questioning, or correcting. To assess coaching fidelity, the researcher collectrf frequency data on the type of coaching statements provided during *e*Coaching via video recorded lessons. See Appendix E for the *e*Coaching fidelity data collection sheet.

Teacher Fidelity

To assess Teacher Participants' ability to implement shared reading and to give students opportunities to interact with the text the researcher developed a teacher fidelity checklist for Teacher Participant questioning with the CROWD. This checklist was modified from teacher task analyses used in previous research (i.e., Browder et al., 2007; Mucchetti, 2013; Roberts & Leko, 2013), but included a measure for comprehension questions asked using the CAR and CROWD.

Inter-Observer Agreement (IOA)

In order to *Meet Evidence Standards* (Kratochwill et al., 2010) and Horner et al.' (2005) *Acceptable* standards, each teacher and student participant measure should be measured over time by more than one researcher. Specifically, IOA was conducted on least 20% of all sessions across all phases (Kratochwill et al., 2010) by a second coder. The second coder was a doctoral student who is enrolled in a doctoral degree-granting program and is receiving federal funding through a leadership development grant sponsored through the Office of Special Education Programs (OSEP). She had previous training and coursework in single subject research methodology, including coding as a form of data collection. To calculate reliability, the researcher divided the total number of agreements by the total number of agreements plus disagreements, and multiplied that number by 100 (Cooper et al., 2007) using the following formula:

$$\% \text{ Reliability} = \frac{\text{Number of Agreements}}{\text{Number of Agreements} + \text{Disagreements}} \text{ X } 100$$

Table 3. Research Model Matrix

Research Question	Dependent Variable	Measurement (Quantitative)	Analysis	Interobserver Agreement (IOA)
RQ 1. How does the online module plus *e*Coaching affect teachers' implementation of the CAR and CROWD, as evidenced by OTR, during shared reading for students with SID?	Teacher participants' use of CAR and CROWD during shared reading.	Teacher participants OTR	Visual Analysis (mean, level, trend, latency) Mean Rate of OTR	(A/A+D) x 100
RQ 2. In what ways does the online module plus *e*Coaching impact the amount and variety of questions asked during comprehension instruction when teachers use the CAR and CROWD during shared reading for students with SID?	Teacher participants' use of CAR and CROWD during shared reading	Type of questions asked by Teacher Participants (e.g., literal or inferential) Variety of questions asked by Teacher Participants (e.g., completion, open-ended, higher order, lower order) Frequency	Visual Analysis (mean, level, trend, latency) Percentage	(A/A+D) x 100

RQ 3. How does teachers' use of the CAR and CROWD impact listening comprehension outcomes for students with SID (i.e., frequency and accuracy of responses)?	Student participants' independent, correct responses to comprehension questions	Number of correct independent correct responses	Visual Analysis (mean, level, trend, latency) Percentage	(A/A+D) x 100
RQ 4. How does teachers' use of the CAR and CROWD impact students with SID engagement during shared reading?	Student participants' overall percentage of engaged time during the lesson	Interval Recording via time sampling for student participant engagement	Visual Analysis (mean, level, trend, latency) Percentage	(A/A+D) x 100

Note: Research matrix includes research questions, dependent variables, measures, measurement, analysis and IOA.

Procedures

Before Data Collection

Prior to beginning the study, the researcher contacted the study site, where she has an established relationship with teachers, administrators, and the lead teacher. The researcher updated the Teacher and Student Participant data collection sheets, contact the IRB at UNCG, and update all forms, as needed, which were approved the previous year for a pilot study (see Appendix G). The researcher then contacted the school and began identifying potential Teacher and Student participants. Once potential participants were

identified, the research met face-to-face with potential Teacher Participants and obtained consent. After obtaining consent, the researcher provided Teacher Participants with the parent/student participant consent forms (i.e., student assent and parent consent), which were be sent home the following day. The researcher delivered the technology equipment the following week. The study did not begin until all Teacher Participants and Student Participant turned in their consent forms.

During Data Collection

Phase One: Baseline. The baseline phase began with all Teacher and Student Participants. During the baseline observations, the researcher instructed Teacher Participants to read to her students as usual during scheduled literacy lesson. No instructions were given to Student Participants. During this time, the researcher observed the Teacher and Student participants for no more than 20 minutes during shared reading, but no online module plus *e*Coaching was provided. Data were collected on Teacher and Student Participant measures, and lessons were recorded using a secure recording device (i.e., Call Recorder for Mac). Finally, as stated previously the researcher uploaded the videos to a secure and private database (i.e., password protected, encrypted, hard drive) for later analysis.

In order to *Meet Evidence Standards,* Kratochwill and colleagues (2010) posited that a multiple-baseline design must have a "minimum of 6 phases with at least 5 data points per phase" (p. 16). In this study, the researcher demonstrated the treatment effect across four phases (i.e., baseline, intervention, maintenance, and generalization), across at

least three Teacher Participants and three Student Participants, and collect five data points for each phase. Baseline stability were defined as five data points, level trend, and little variability.

Phase Two: Intervention (module + *e*Coaching). The intervention began once Teacher Participant 1 met the set criteria (i.e., 5 continuous sessions of data collection), and Teacher Participants were staggered into the intervention (Gast, 2010). Note: the researcher chose Teacher Participant one because her students' data (Student Participant 1) indicated a decelerating trend while her questioning indicated a relatively stable increasing trend. Once Teacher Participant 1 met the set criteria, she was then sent the link to the online module and instructed to complete it within 24 hours. Similar to baseline, the researcher instructed Teacher Participant 1 to conduct her shared reading lesson during her scheduled literacy time, but she was asked to incorporate the CAR and CROWD strategies learned through the online module. During this phase, the researcher provided *e*Coaching feedback (i.e., instructing/correcting, encouraging, or questioning) in situ, while the Teacher Participant conducted her lesson, and collected data on Teacher and Student Participant measures as discussed previously (see Appendix E). Following the lesson, the researcher coded the videos using the data collection sheets. In order to *Meet Evidence Standards* (Kratochwill et al., 2010) will collect a minimum of 5 data points during the intervention phase.

Data were collected continuously for all participants. Once Teacher Participant 1 met the set criteria (i.e., 5 continuous sessions of data collection) during the intervention

phase, Teacher Participant 2 entered the intervention. This cycle continued until all participants have entered the intervention phase (Gast, 2010).

Phase 3: Maintenance. Once all Teacher Participants met the set criteria in the intervention phase (i.e., at least 5 continuous sessions of data collection) they entered the maintenance phase. During the maintenance phase, the researcher instructed Teacher Participants read to their students just like they did during the intervention phase. The researcher observed Teacher and Student Participants for no more than 20 minutes during shared reading, but no additional online module or *e*Coaching were provided. Data were collected on Teacher and Student Participant measures, and lessons were recorded using a secure recording device (i.e., Call Recorder for Mac). Finally, the researcher uploaded the videos to a secure and private database (i.e., password protected, encrypted, hard drive) for later analysis. In order to *Meet Evidence Standards* (Kratochwill et al., 2010) will collected a minimum of 5 data points during the maintenance phase.

Phase 4: Generalization. Once all Teacher Participants met the set criteria (i.e., 5 days of continuous data collection), they entered the generalization phase. During the generalization phase, the researcher instructed Teacher Participants to read to their students as usual during scheduled literacy lesson, but they read an expository text. The researcher observed the Teacher and Student Participants for no more than 20 minutes during shared reading and no additional online module or *e*Coaching was provided. The researcher continued collecting data on Teacher and Student Participant measures, and lessons were recorded using a secure recording device (i.e., Call Recorder for Mac) as described during intervention. Again, the researcher uploaded the videos to a secure and

private database (i.e., password protected, encrypted, hard drive) for later analysis. In order to *Meet Evidence Standards* (Kratochwill et al., 2010) the researcher collected a minimum of 5 continuous data points during the generalization phase (Kratochwill et al., 2010).

After Data Collection

In order to assess the overall importance and feasibility of the study, Teacher Participants completed a 10, 5-point Likert-type researcher created the questionnaire. The link to the questionnaire (https://uncg.qualtrics.com/SE/?SID=SV_5tj8Z7NLt4v5HYp) was delivered via email and completed on Qualtrics. The survey included questions that were adapted from Horner et al. (2005). Again, the survey questions and links are provided in Appendix F.

Single Subject Quantitative Data Analysis

Visual Analysis

The traditional way to measure the effect of an intervention for SSRD is through visual analysis. By charting data graphically, researchers are able to see changes in participant's behaviors from baseline to intervention (see Gast, 2010). Specifically, visual analysis enables researchers to view a functional relationship between the independent variable (i.e., online module + *e*Coaching) and dependent variables (i.e., Teacher Participants' use of the CAR and CROWD; type and variety of questions asked; Student Participants' independent correct responses to listening comprehension questions; Student Participant's engagement). In this study, the researcher examined within-participants behavior through a visual analysis examining *mean* (average

performance during intervention), *level* (immediacy and magnitude of change), *trend* (ascending or descending), and *latency* (quickness) of change (Tankersley et al., 2008) to determine the functional relationship between the online module plus *e*Coaching and Teacher Participants' use of the CAR and CROWD, amount and variety of questions asked, Student Participants' engagement, and changes in listening comprehension.

Effect Size

In order to compare data between baseline and intervention and to demonstrate the overall effect of the intervention, the researcher calculated the Percentage of Non-Overlapping Data (PND; Scruggs, Mastropieri, & Castro, 1987). While acknowledging the multiple ways to calculate effect size in single subject research (Parker, Vannest, & Davis, 2011), such as Percentage of All Non-overlapping Data (PAND), Extended Celeration Line (ECL), and Percentage of Phase B exceeding Phase A median (PEM), the researcher calculated PND because it is a widely published method for calculating effect size in SSRD (Parker et al., 2011; Scruggs et al., 1987). The researcher used the following formula to calculate PND:

$$\frac{\text{Number of Data Points in the Intervention Phase Above the Highest Data Point in Baseline}}{\text{Total Number of Data Points in the Intervention Phase Above the Highest Data Point in Baseline}}$$

Although PND may range from 0% to 100%, higher PND values indicate a greater impact of the intervention. For example, in this study if the researcher calculated a PND of 100%, this would indicate that the online module plus *e*Coaching was highly effective in increasing teacher's ability to implement the CAR and CROWD during shared reading for students with SID.

Summary

The purpose of this study was to investigate the effects of an online module plus *e*Coaching on in-service teachers use of comprehension strategies (i.e., CAR and CROWD) as they provided comprehension instruction to students with SID. Specifically, the researcher investigated the effects of an online module plus *e*Coaching on teachers' use of the CAR and CROWD during shared reading for students with SID. A single subject, multiple-baseline design was used to conduct this investigation. The researcher adhered to the quality indicators for single subject research (i.e., Horner et al., 2005; Kratochwill et al., 2010). Following the intervention, the researcher analyzed the data visually (Tankersley et al., 2008) and calculated effect size (PND; Scruggs et al., 1987).

The researcher hypothesized that the results of this research added to the professional literature by providing evidence to support the use of question answering and mnemonics during comprehension instruction for students with SID. Additionally, the researcher hypothesized the online module plus *e*Coaching further adds to the professional literature on effective professional development (e.g., Joyce & Showers, 1982) and *e*Coaching (e.g., Rock et al., 2009). Finally, the researcher speculated that results of this study have the potential to improve comprehension instruction for students with SID by adding to the literature that confirmed these students can learn more complex tasks.

CHAPTER IV

RESULTS

The purpose of this study was to investigate the effects of job-embedded professional development (i.e., Module + *e*Coaching) on in-service teachers as they provided comprehension instruction to students with SID. This chapter includes the results of this study organized by research questions, social validity, interobserver agreement, and treatment fidelity.

Participants and Setting

As described in Chapter III, three special education teachers and three elementary students with SID participated in this study. All Teacher Participants taught special education in separate classrooms, which were located in a private school. Additionally, each Teacher Participant provided daily literacy instruction to elementary students with SID. Table 2 in Chapter III provided descriptive information about Teacher and Student Participants. A total of 86 sessions were conducted and video archived, which included 26 sessions for Teacher Participant 1 and 30 sessions for both Teacher Participants 2 and 3.

Within Participants Visual Analysis

As stated in Chapter III, the researcher examined within-participants behavior through a visual analysis examining *mean* (average performance during intervention), *level* (immediacy and magnitude of change), *trend* (ascending or descending), and

latency (quickness) of change (Tankersley et al., 2008) to determine the functional relationship between the online module plus *e*Coaching and Teacher Participants' use of the CAR and CROWD, amount and variety of questions asked, Student Participants' engagement, and changes in listening comprehension. The researcher created graphic displays to display accelerating, decelerating trends, or variable trends in the mean rate of opportunities to respond (OTR), teacher questioning, student independent correct responses to comprehension questions, and student engagement (see Figures 1 and 2). Additionally, the level and latency of the data are also displayed in Figures 1 and 2. Finally, the researcher calculated the mean and effect during and across each phase which are depicted in Table 4.

Table 4. Means, Standard Deviation, and Percentages of Non-Overlapping Data Across Phases

	OTR		Questioning		Student Comprehension		Student Engagement	
Participant/Phase	M	SD	M	SD	M	SD	M	SD
Teacher 1								
Baseline	1.97	0.28	26.6	2.38	1.4	0.24	100	0
Intervention	2.99	0.20	44.47	3.93	10.07	1.07	90.45	7.07
PND	60%		87%		100%		73%	
Maintenance	3.15	0.19	27.2	0.49	12.8	1.16	100	0
PND	0%		0%		0%		100%	
Generalization	2.9	0	50	0	14	0	100	0
PND	0%		100%		0%		100%	
Teacher 2								
Baseline	0.38	0.18	3.60	1.84	0.7	0.33	100	0
Intervention	2.85	0.11	24.30	1.64	14	1.23	100	0
PND	100%		70%		100%		100%	
Maintenance	3.04	0.12	22.20	1.66	17	1.18	100	0
PND	0%		0%		20%		100%	
Generalization	2.40	0.11	16.40	1.47	9.4	1.50	100	0
PND	0%		0%		0%		100%	
Teacher 3								
Baseline	0.18	0.06	1.47	0.54	0.53	0.27	100	0
Intervention	2.54	0.28	27.80	3.54	19.8	2.52	100	0
PND	100%		100%		100%		100%	
Maintenance	5.00	0.54	38.20	2.94	29.20	2.96	100	0
PND	0%		60%		40%		100%	
Generalization	29.3	0.32	36.20	4.63	11.6	1.29	100	0
PND	0%		20%		0%		100%	

Note. PND = Percentage of Non-Overlapping Data (Scruggs & Mastropieri, 1998)

Percentage of Non-Overlapping Data

To compare the effect of the online module plus *e*Coaching across all phases, the researcher calculated the overall effect of the intervention (i.e., PND; Scruggs et al., 1987). To determine the effect, the researcher use the following guidelines outlined in Scruggs and Mastropieri (1998): PND percentages greater than or equal to 90% were

regarded as highly effective; PND percentages between 70% and 90% were considered effective; PND percentages between 50% and 70% were considered questionable; and PND percentages equal to or below 50% were considered ineffective. See Table 4 for PND of each dependent variable across phases.

Research Question 1

How does the online module plus *e*Coaching affect teachers' implementation of the CAR and CROWD, as evidenced by OTR, during shared reading for students with SID?

In order to investigate the impact of the CAR and CROWD during shared reading for students with SID, the researcher calculated the mean rate of OTR. Each question was "cluster question" (i.e., multiple related questions consecutively) was considered one OTR. For example, "Where's the Gruffalo" was counted as on OTR, but "Where's the Gruffalo? Where's the mouse going" was counted as two OTRs, because those were two unrelated questions. See Appendix A for additional examples of "cluster questions". Table 4 reflects each Teacher Participant's individual data (i.e., the average mean rate of OTR) and Figure 1 provides a graphic display of each participants' data.

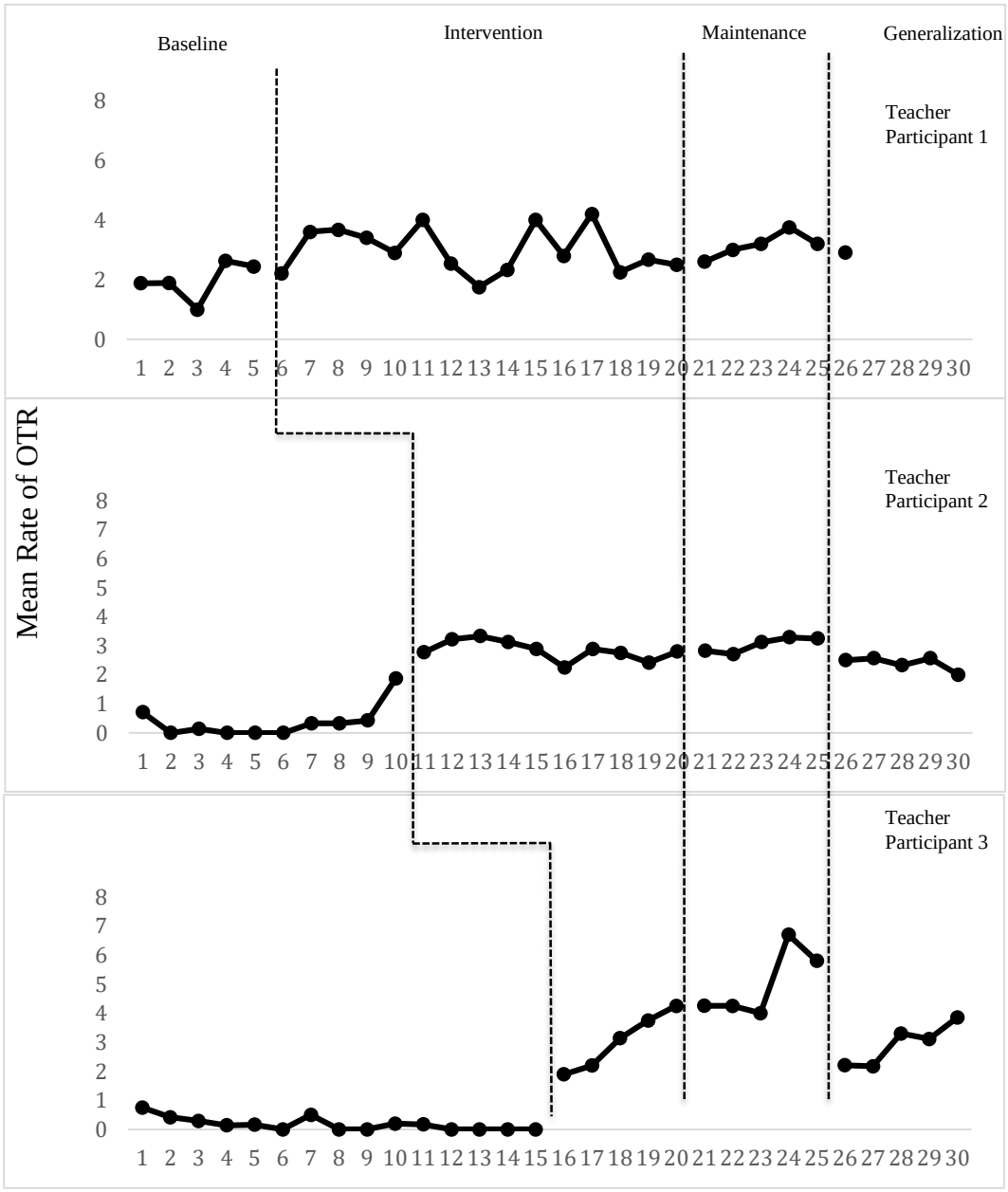
All Teacher Participants increased their mean rate of OTR from baseline to intervention (see Table 4); however, Teacher Participant 2 and Teacher Participant 3 experienced and immediate increase from baseline to intervention. Teacher Participant 1 increased her mean rate of OTR from 1.97 average in baseline to 2.99 average during intervention; Teacher Participant 2 increased her mean rate of OTR from 0.39 average in baseline to 2.85 average during intervention; and Teacher Participant 3 increased her

mean rate of OTR from 0.18 average in baseline to 2.54 average during intervention (increasing trend). PND for Teacher Participant 1 was 60%, which indicated a questionable effect, while PND for Teacher Participants 2 and 3 was 100%, which indicated the intervention was highly effective.

All Teacher Participants also increased their average mean rate of OTR from intervention to maintenance. Teacher Participant 1 increased her average mean rate of OTR from 2.99 during intervention to 3.15 in the maintenance phase. Teacher Participant 2 increased her average mean rate of OTR from 2.85 during intervention to 3.04 in the maintenance phase. Finally, Teacher Participant 2 increased her average mean rate of OTR from 2.54 during intervention to 5.00 in the maintenance phase. PND for all Teacher Participants was 0% during maintenance, indicating the intervention was ineffective.

Finally, all Teacher Participants decreased their average mean rate of OTR from maintenance to generalization. Teacher Participant 1 decreased her average mean rate of OTR from 3.15 during maintenance to 2.90 during generalization. Teacher Participant 2 decreased her average mean rate of OTR from 3.04 during maintenance to 2.40 during generalization. Teacher Participant 3 decreased her average mean rate of OTR from 5.00 during maintenance to 2.93 during generalization. PND for all Teachers was 0% during generalization, indicating the intervention was ineffective.

Figure 1. Teacher Participants' Use of Opportunities to Respond (OTR)



Research Question 2

In what ways does the online module plus *e*Coaching impact the amount and variety of questions asked during comprehension instruction when teachers use the CAR and CROWD during shared reading for students with SID?

To investigate the ways in which the online module plus *e*Coaching impacted the amount and variety of questions asked during comprehension instruction when teachers use the CAR and CROWD during shared reading for students with SID, the researcher calculated the (a) frequency of questions (CROWD and Non-CROWD), (b) frequency of types of questions (literal, inferential, critical, evaluative), and (c) frequency of level of questions (higher order vs. lower order) asked during shared reading when teachers used the CAR prompt and CROWD questioning prompt. Note: The researcher counted questions individually, regardless of whether or not they were "cluster questions" (i.e., multiple related questions consecutively) as one OTR. For example, "Where's the Gruffalo?" was counted as on question, but "Where's the Gruffalo? Where's is he?" were counted as two questions.

Frequency of Comprehension Questions

As stated in Chapter II, the CROWD includes questions of the following type: completion, recall, WH (who, what, where, when, why, and how), and distancing prompts. The researcher calculated the frequency of CROWD questions asked across all phases as well as the frequency of non-CROWD question. See Table 4 for PND. During the sessions, the most frequently used questioning type was WH questions. Teacher Participant 1 asked 64 WH questions during baseline, 331 during intervention, 84 during

maintenance, and 30 during generalization. During sessions 11-13, the Teacher Participant was instructed to change the book because Student Participant 1 developed what Teacher Participant 1 termed "a fear of the book." Once the new book was introduced, data stabilized. Teacher Participant's 2 and 3 followed similar patterns with 17, 85, 51, and 66 WH questions asked by Teacher Participant 2 across all phases, and 9, 45, 53, and 73 asked by Teacher Participant 3. The second most frequently asked questions included completion prompts. Teacher Participant 1 asked 44 completion prompts during baseline, 249 during intervention, 43 during maintenance, and 8 during generalization. Again, Teacher Participant's 2 and 3 followed similar patterns with 19, 157, 61, and 2 completion prompts asked by Teacher Participant 2 across all phases, and 5, 84, 139, and 86 completion prompts asked by Teacher Participant 3. See Figure 2 for a graphic display of Teacher Participant Questioning Data.

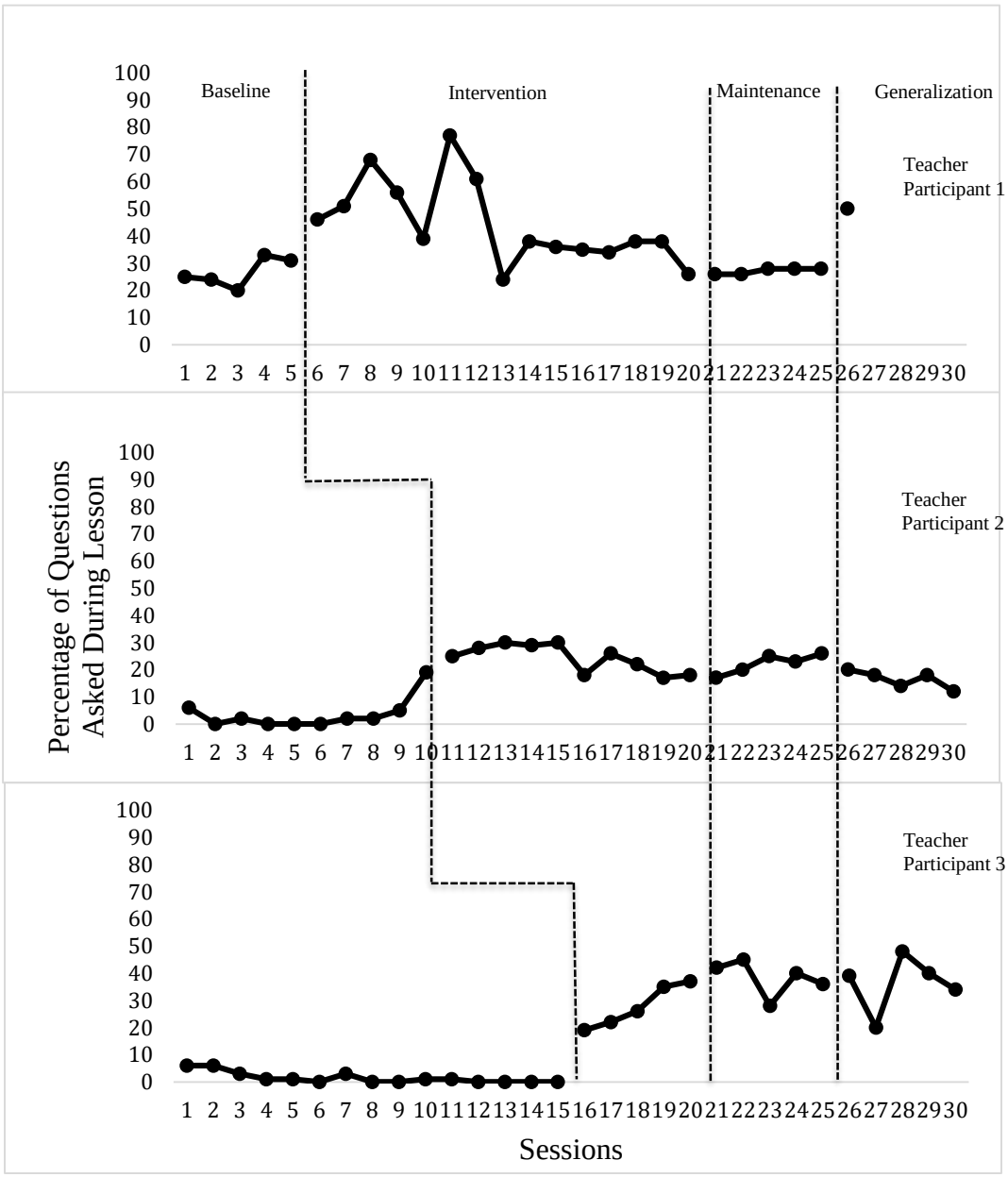
Frequency of Type and Level of Comprehension Questions

Across all sessions, all three participants asked literal/lower order or inferential/higher order questions, and none asked critical or evaluative questions. The literal questions were coded as lower order questions, and the inferential questions were coded as higher order, which the researcher then converted to percentages. For Teacher Participant 1, the percentage of literal/lower order questions was 90% or above for 25 out of 26 sessions. Teacher Participant 2 asked literal/lower order questions at a percentage of 90% or above in 17 out of 30 sessions, 80%-90% for 9 out of 30 sessions, and 0% (i.e., asked no questions) during 4 sessions. Teacher Participant 3 asked literal/lower order questions at a percentage of 90% or above in 15 out of 30 sessions, 80%-90% for 4 out of

30 sessions, 60%-70% for 3 out of 30 sessions, 30%-40% for 1 session, and and 0% (i.e., asked no questions) during 7 sessions.

The second type of questions Teacher Participants asked were higher order/inferential questions and the frequency (percentage) of these types of questions was much lower. For Teacher Participant 1, the percentage of inferential/higher order questions was 50% or above for 1 out of 26 session and the range for the remaining sessions was 0%-8%. Teacher Participant 2 asked inferential/higher order questions at a mean percentage of 6% (range = 0%-19%) for all 30 sessions. Finally, Teacher Participant 3 asked inferential/higher order questions at a percentage of 60% or above in 1 out of 30 sessions, 20%-40% for 3 out of 30 sessions, and 19% of below for 26 of 30 sessions.

Figure 2. Teacher Participant Questioning Frequency



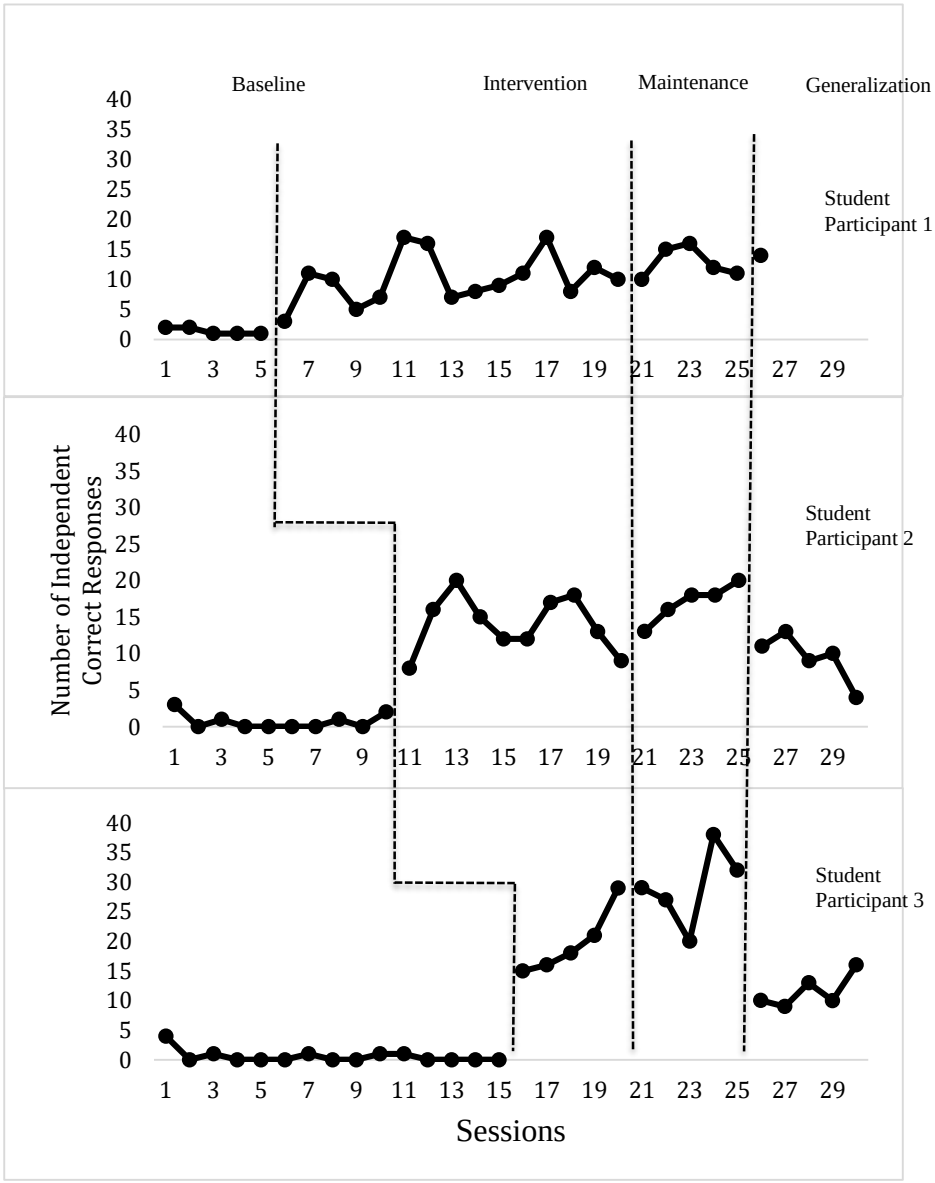
Research Question 3

How does teachers' use of the CAR and CROWD impact listening comprehension outcomes for students with SID (i.e., frequency and accuracy of responses)?

To investigate how teacher's use of the CAR and CROWD impacted listening comprehension outcomes for students with SID, the researcher calculated the frequency and accuracy of student responses (see Figure 2). All Teacher Participants varied the amount or frequency of questions asked during each lesson which impacted the amount of OTRs across all phases. Teacher Participant 1 asked an average of 27 questions during baseline (range = 20-33), 44 during intervention (range = 24-77), 27 during maintenance (range = 26-28), and 50 during generalization (range = 0). Of those questions, Student Participant 1 answered an average of one question correctly during baseline (range = 1-2), 10 during intervention (range = 3-17), 13 during maintenance (range = 10-16), and 14 during generalization (range = 0). PND across all phases was 100%, 0%, and 0% respectively. Teacher Participant 2 asked an average of 4 questions during baseline (range = 0-19), 24 during intervention (range = 13-17), 22 during maintenance (range = 9-17), and 16 during generalization (range = 8-12). Of those questions, Student Participant 2 answered an average of less than 1 question correctly during baseline (range = 0-3), 14 during intervention (range = 8-20), 17 during maintenance (range = 7-13), and 9 during generalization (range = 4-13). PND across all phases was 100%, 20%, and 0% respectively. Teacher Participant 3 asked an average of 1 question during baseline (range = 0-6), 28 during intervention (range = 19-37), 38 during maintenance (range = 28-45),

and 36 during generalization (range = 20-48). Of those questions, Student Participant 3 answered an average of less than 1 question correctly during baseline (range = 0-4), 20 during intervention (range = 15-29), 29 during maintenance (range = 18-20), and 11 during generalization (range = 9-16). PND across all phases was 100%, 40%, and 0% respectively.

Figure 3. Student Participant Independent Correct Responses to Comprehension Questions



Research Question 4

How does teachers' use of the CAR and CROWD impact students with SID engagement during shared reading?

To investigate how teachers' use of the CAR and CROWD impacted the engagement of students with SID during shared reading, the researcher measured student engagement using time sampling via interval recording during 2-minute intervals (Cooper et al., 2007). Teacher Participants' lessons ranged from 5 minutes to 14 minutes. The average student engagement for Student Participant 1 was 94.50% (range = 0-100%). Student Participant 1 was 100% engaged during 24 of the 26 lessons. PND for Student Participant 1 was 73% during the intervention phase. The researcher calculated student engagement for Student Participants 2 and 3 to equal 100% across all phases. PND for Student Participants 2 and 3 was 100%.

Social Validity

At the completion of the study (i.e., after completing the generalization phase, all three participants completed a social validity survey via Qualtrics. As discussed in Chapter III, the survey included 10, 5-point Likert-type scale questions in which Teacher Participants will indicated their level of satisfaction with the intervention (i.e., training package). Scores on the Likert-type scale range from 1 to 5 with the numbers representing the following: 1 = strongly agree, 2 = agree, 3 = neither disagree or agree, 4= disagree, 5=strongly disagree.

Overall, all Teacher Participants agreed or strongly agreed the online module was accessible, practical, and useful. Additionally, all Teacher Participants agreed or strongly

agreed the online module strengthened their skills as a teacher, they found the knowledge beneficial, and the CAR and CROWD were easy to incorporate into their shared reading lessons. In regards to the real-time, in-ear coaching (i.e., *e*Coaching), all three Teacher Participants reported the eCoaching was not distracting during instruction and it increased their ability to use the CAR and CROWD during their lesson. Finally, 67% of Teacher Participants reported that they noticed and increase in their Student Participant's listening comprehension, and 33% of Teacher Participants reported no noticeable changes (i.e., neither agree or disagree).

Interobserver Agreement

The researcher conducted 86 sessions, which were video recorded and archived. To check reliability, the researcher and a trained observer watched and coded 20% of the archived video files across all phases (i.e., baseline, intervention, maintenance, and generalization). Overall, reliability throughout the sessions was 99% (range = 82%-100%). As discussed previously in Chapter III, reliability was calculated by dividing the total number of agreements by the total number of agreements plus disagreements, and multiply that number by 100 (Cooper et al., 2007). The following formula was used:

$$\% \text{ Reliability} = \frac{\text{Number of Agreements}}{\text{Number of Agreements} + \text{Disagreements}} \text{ X } 100$$

To assess reliability of data, the researcher and the trained observer watched and coded the recorded videos independently. Frequency counts for OTR, number of questions, CROWD questions, level of question, type of question, student correct

independent response, and response mode were recorded and totaled on a paper coding sheet. Once all data were collected, the researcher calculated the percent reliability via point by point agreement. The dependent variable assessed for RQ 1 was OTR. Overall, OTR across all phases was 95%. The dependent variables assessed for RQ 2 were number, type, and variety of questions asked by the Teacher Participants. Overall reliability for questioning was 93%. The dependent variables assessed for RQ 3 and RQ 4 were student independent correct responses and student engagement engagement. Overall agreement was 100% across all phases for both dependent variables. Finally, overall agreement was calculated for teacher and coach fidelity, both of which were 100%. See Table 5 for a more detailed list of IOA across phases.

Table 5. Percent Agreement and Range for Reliability Across Phases

	OTR		**Questioning**		**Independent Correct Student Responses**		**Student Engagement**		**Teacher Fidelity**	
	IOA	**Range**	**IOA**	**Range**	**IOA**	**Range**	**IOA**	**Range**	**IOA**	**Range**
Baseline	100		100		100		100		100	
Intervention	91	82-97	91	83-96	100		100		100	
Maintenance	99	97-100	88	86-89	100		100		100	
Generalization	91	82-100	93	92-94	100		100		100	

Note. Percentage of agreement calculated for 20% of all sessions across phases (Kratochwill et al., 2010).

Treatment Fidelity

The researcher assessed treatment fidelity via frequency counts of *e*Coaching fidelity and teacher fidelity. The researcher and a trained observer examined and coded the *e*Coach's comments as encouraging, instructing/correcting, or questioning, then entered the frequency counts on her coding sheet. Percentage of agreement for the frequency of statements was calculated at 100% across all phases and participants. The researcher then calculated the ratio of encouraging statements to instructing/correcting statements to determine whether the coach's feedback mirrored the suggested ratio of 4:1 (Rock et al., 2009). For Teacher Participant 1, the coaching fidelity was 3.87:2.86; for Teacher Participant 2, the coaching fidelity was 4.8:2.2; and for Teacher Participant 3, the coaching fidelity 4.8:4.6. Overall, these ratios indicate the coach did not meet the suggested ratio of 4:1.

In addition, the researcher assessed teacher fidelity, by calculating the presence or absence of Teacher Participants reading in a shared reading format and if they asked CROWD questions. Teacher Participant 1 had 100% fidelity for 100% of her sessions. However, Teacher Participant 2 had 86% fidelity across her sessions (40% in baseline; 100% in intervention, maintenance), and generalization, and Teacher Participant 3 had 77% (47% in baseline; 100% in intervention, maintenance). Percentage of agreement for teacher fidelity was calculated at 100% across all phases and participants.

Summary

In summary, after completing the online module and receiving *e*Coaching, all three Teacher Participants increased their mean rate of OTRs, frequency and variety of

questions during the intervention, and they were beginning to ask higher order/inferential questions (i.e., when they were supported by the coach). However, they experienced difficulty sustaining these practices during the maintenance phase and were not able to generalized to a different type of text. Additionally, all Student Participants were provided more OTR and began to answer more questions correctly and independently. Finally, overall Student Participants remained engaged throughout all phases of the study and there was no evidence that the eCoaching disrupted teaching or learning.

The purpose of this study was to investigate the effects of job-embedded professional development (i.e., Module + *e*Coaching) on in-service teachers as they provided comprehension instruction to students with SID. Therefore, the researcher implemented multiple measures to assess changes in Teacher Participant and Student Participant behavior. Although these changes varied among all participants, Teacher Participants showed growth in the amount and variety of questions asked, and Student Participants demonstrated they could answer comprehension questions correctly and independently.

The researcher collected social validity from all Teacher Participants at the completion of the final phase (i.e., generalization) of the study. Overall, Teacher Participants rated the online module as beneficial, helpful, and easily accessible for gaining the information. They also stated the *e*Coaching enhanced their ability to implement the CAR and CROWD during instruction and was not a distraction during teaching. Additionally, two out of three teachers cited noticeable gains in student comprehension, while one teacher cited no visible gains or losses in comprehension.

Finally, interobserver agreement and treatment fidelity were assessed for consistency with measurement of OTR, teacher questioning, student comprehension, and student engagement. The researcher and trained second coder met or exceed the minimal levels of agreement (i.e., 80%; Cooper et al., 2007) across all phases of the study. Treatment fidelity was assessed for coaching statements and teacher use of the CAR and CROWD. Overall, the *e*Coach provided less encouraging praise than recommended by Rock and her colleagues (2009), but Teacher Participants were able to ask questions using the CROWD during intervention, maintenance, and generalization.

In the following chapter, Chapter V, the researcher will discuss the results of the study, discuss limitations, and provide future directions.

CHAPTER V

DISCUSSION

The purpose of this study was to investigate the effects of job-embedded professional development (i.e., Module + *e*Coaching) on in-service teachers as they provided comprehension instruction to students with SID. This chapter includes a brief summary of the study, a discussion of the main findings, and limitations of the study. The researcher concludes by providing implications of the findings and future research directions.

Summary

When applying the criterion of the least dangerous assumption (Donnellan, 1984; Jorgenson, 2005), students with SID have the right to receive rigorous literacy instruction taught by teachers that assume students with SID can benefit from it. To do this, teachers of students with SID must transform their current literacy practices (e.g., sight word instruction) to include more difficult concepts such as how to comprehend text.

Drawing on Mezirow's (1990; 2003) theory of transformative learning, the researcher sought to facilitate teachers' epistemic meaning perspective through an online module + *e*Coaching. Of the three meaning perspectives, the epistemic meaning perspective was the most relevant to this study because it related to knowledge or the use of knowledge (Cranton, 1994). Through and online module, the researcher helped

teachers of students with SID gain knowledge of the CAR and CROWD and then provided *e*Coaching to encourage use of these strategies during shared reading. By structuring the intervention (i.e., online module + *e*Coaching) in this way, the researcher avoided the pitfalls of traditional professional development, which have been described as costly, ineffective, and piecemeal (Hargreaves, 2007). Alternatively, the researcher provided an intervention that met the critical components of effective professional development (i.e., Desimone, 2009; Joyce & Showers, 1982; Leko & Brownell, 2009). In doing this, data confirm that the Teacher Participants began to transform their literacy instruction for students with SID.

Given the limited amount of time Teacher Participants received *e*Coaching, the results of this study were promising. Results of the social validity questionnaire confirmed that the CAR and CROWD were feasible to use during classroom instruction, the online module was an accessible way to access the knowledge, and the *e*Coaching was not a distraction, but encouraged Teacher Participants' use of the CAR and CROWD. In the following sections, the researcher discusses the main findings of the study and provides implications for future research.

Convergent Findings

A review of the literature confirmed that literacy instruction has been placed on the backburner for students with SID, because it is "complex and poorly understood issue" (Erickson et al., 2009, p. 1). Additionally, literacy instruction for this population often lacks a focus on comprehension. Despite findings from previous research by Browder and colleagues (2008), which indicated students with SID could learn and be

taught to comprehend text, teachers of students with SID continue to take a more traditional approach to literacy instruction that focuses on functional sight words through drill and practice (e.g., Katims, 2000). Therefore, in this dissertation study, the researcher set out to investigate the effects of an online module to help teachers gain knowledge of comprehension instruction (i.e., using CAR and CROWD mnemonic strategy) plus *e*Coaching to facilitate teachers' use of their knowledge in the classroom.

Comprehension Strategy Instruction

In 2000, the NRP recommended the use of mnemonic strategies and questioning to encourage student comprehension. Although the NRP report focused on students without disabilities, results remained promising for students with disabilities. As mentioned previously, Berkeley and colleagues (2010) found questioning was effective in teaching students with high incidence disabilities to comprehend text. Additionally, Mastropieri, Scruggs, Hamilton, Wolfe, Whedon, and Canavaro (1996) taught students with learning disabilities to self-question and used teacher questioning to promote understanding of the text. Although results of their study were mixed, researchers stated active reasoning (i.e., questioning) encouraged higher levels of comprehension.

In this dissertation, the researcher used the CAR and CROWD to encourage questioning by Teacher Participants and to help Teacher Participants remember what types of questions to ask during shared reading. Results of this study align with and extend those of Mastropieri et al. (1977) by including students with SID. Additionally, the CAR and CROWD prompt were teacher directed comprehension strategies. For students with SID to learn new content, they must be explicitly taught how to do so (see

Browder & Spooner, 2011). The results of this study remain promising for future use of teacher directed comprehension prompts to encourage comprehension of text.

CAR and CROWD

As discussed in Chapter II, Whitehurst et al. (1994) conducted a study using the CROWD along with the PEER strategy to examine the effect of dialogic reading and sound foundations on the literacy development of preschool children. To date, the study conducted by Whitehurst and colleagues (1994) has been the only study in which researchers used the CROWD strategy. In their study, researchers used a group experimental design, student participants were typically developing preschool children, and the adult participants were parents and teachers. Additionally, parents and teachers were trained via a 20-minute video. During this training, parents and teachers were taught how to read dialogically. Additionally, they participated in brief role-playing activities and a discussion. Findings of their study indicated preschool children improved their writing, print concepts, language, and linguistic awareness.

In this dissertation study, several findings align with those of Whitehurst and colleagues. For example, the researcher conducted an experimental study, provided training for teachers, and assessed student outcomes. However, because the researcher conducted the study on students with SID, a SSRD was used to investigate impact on student outcomes. Additionally, the researcher conducted the training via an online module vs. a 20-minute video and provided *e*Coaching instead of role playing and discussions.

The results of this study extend those of the previous research because Whitehurst et al. (1994) investigated literacy outcomes via a standardized pre- and post-assessment (e.g., Peabody Picture Vocabulary Test- Revised); however, measurement of student comprehension was not included. In this dissertation study, the researcher measured student comprehension through independent correct responses and also measured student engagement. Results confirmed that teachers can acquire new knowledge through an online module plus *e*Coaching and teacher use of the CROWD may be an effective way to help students with SID comprehend text.

Professional Development and *e*Coaching

As previously mentioned in Chapters I and II, traditional professional development typically occurs outside of the classroom environment and fails to align with ongoing teacher practice (Loucks-Horseley & Matsumoto, 1999). However, job-embedded professional development is designed to help teachers acquire new content knowledge and skills and to help them make the connection between learning and application. Since researchers indicate teachers often struggle when translating knowledge learned during traditional professional development (see Rock et al., 2011), designing easily accessible professional development and supporting teachers throughout the learning and application must be a priority.

Joyce and Showers (1980), Desimone (2009), and Leko and Brownell (2009) recommend several components needed to provide effective professional development. Joyce and Showers (1980) state effective professional development must include the study of the skill, modeling or demonstration, practice with feedback, and coaching.

Desimone (2009) identified several components such as content focused, duration of 20 hours or more of contact time, and active learning through observation. Leko and Brownell (2009) provided similar recommendations but added highlighting effective strategies for instruction and involving experts in the field.

Findings of this dissertation support those of Joyce and Showers (1980), Desimone (2009), and Leko and Brownell (2009). First, through the online module, Teacher Participants studied the CAR and CROWD, they observed teachers using the CAR and CROWD via videos and book examples, and they received feedback on their use of the CAR and CROWD during instruction via *e*Coaching. Second, the researcher, who is an expert, university affiliated doctoral scholar with extensive knowledge, expertise, and training in literacy for students with SID and *e*Coaching, provided *e*Coaching.

One component of effective professional development was coaching (Joyce & Showers, 1980), and *e*Coaching via BIE technology enables the coach to provide immediate, discreet feedback to the teacher, in situ (see Rock et al., 2014). Additionally, researchers have demonstrated that *e*Coaching can help teachers transfer new knowledge into classroom practice. In her studies, Rock and colleagues (2009; 2012; 2014) demonstrated that *e*Coaching was effective in increasing teachers' use of evidence-based practices (e.g., high and low access instructional strategies) and positively impacted classroom climate (e.g., teacher redirects and student engagement). Sheeler et al. (2012) demonstrated that *e*Coaching was effective in increasing teachers' use of TTC trials, while Ploessl and Rock (2014) found that *e*Coaching increased teachers' co-teaching

planning and instruction. Finally, Coogle et al. (2015) demonstrated that *e*Coaching was effective in increasing teachers' use of communication strategies during early child hood leisure activities.

In this dissertation study, although the data were variable, the researcher concludes that *e*Coaching facilitated Teacher Participants' use of the CAR and CROWD because of the increase in level and trend from baseline to intervention for all Teacher Participants on questioning frequency (see Figure 2). Teacher Participant 1 had the most variable data. She demonstrated a relatively increasing trend during the intervention phase, with a dip during session 13. Data then stabilize during session 14 but then begin to decrease until the end of the intervention phase. During the maintenance phase data were stable and since only once data point was collected during the generalization phase, the researcher was unable to establish a trend. Teacher Participant 2's data increase and were stable during the intervention phase until session 16 where there was a slight dip. During session 17 data increase slightly but then they decrease steadily until the end of the intervention phase. During maintenance, her data increased, but there was a clear descending trend during the generalization phase. Finally, Teacher Participant 3 demonstrated a clear increasing trend during the intervention phase, a relatively decreasing trend during the maintenance phase, and a relatively increasing trend during the maintenance phase.

The variability in the trends across all Teacher Participants and phases could be attributed to several factors. For instance, Teacher Participant 1 was the only Teacher Participant with a degree related to education (i.e., psychology) whereas Teacher

Participant 2 had a degree in business administration and Teacher Participant 3 never clarified her education. Also, the researcher speculates that Teacher Participant 2's past expertise in Autism and Applied Behavior Analysis (see Cooper et al., 2007), may have interfered her with her learning of how to ask questions. Additionally, Teacher Participant 3 was very concerned with Student Participant 3's behavior and was hesitant about asking him questions because of his behavior. However, as the Teacher Participant 3 began asking more questions, Student Participant 3 because more interested in the books, and demonstrated he could answer the questions independently and correctly. Finally, the *e*Coaches feedback may have played a role in Teacher Participant variability. Although *e*Coaching was individualized for each Teacher Participant, the *e*Coach's feedback focused specifically on three areas (i.e., frequency, variety, and level of questioning) but the *e*Coach could have included more examples of higher order questions.

Despite the variability in Teacher Participant data, findings of this dissertation study support those of previous *e*Coaching research. Similar to the work of Rock et al. (2009; 2012; 2014), and Ploessl and Rock (2014), the researcher conducted *e*Coaching through Skype and BIE technology. Although, the researcher was unable to determine which feature of the intervention package was most effective- online module or the *e*Coaching-the results of this study remain promising because Teacher and Student Participants experience positive results on their dependent variables from baseline to intervention. Additionally, because this dissertation study included elementary aged Student Participants with SID, it extended the work of Rock and colleagues (2009; 2012;

2014), Ploessl and Rock (2014), Coogle et al. (2015), and Scheeler et al. (2012). Thus, this study extends the work of previous research because it combines an online module plus *e*Coaching as the intervention package and Student Participants were diagnosed with SID.

In addition, results of this study suggest that an online module was an effective way to deliver knowledge of the CAR and CROWD to teachers. Based on the results of the social validity questionnaire, Teacher Participants noted the accessibility, practicality, and usefulness of the online module and its content, which supported the findings of Rock et al. (2009). Additionally, results indicate that *e*Coaching facilitated the transfer of knowledge into classroom practice. These findings aligned with those of Rock and her colleagues (2009; 2012; 2014).

Comprehension Instruction for Students with SID

In 2008, Browder and colleagues taught elementary students with multiple disabilities to participate in shared stories, making their research a seminal piece in the field of SID because several measures written on the teacher task analysis, targeted student comprehension. In this dissertation study, the researcher had a similar goal in mind (i.e., to investigate the comprehension outcomes for students with SID); however, the researcher also focused on the teachers. Results of this dissertation study support the findings of Browder et al. (2008) because they confirmed that students with SID could participate in more rigorous literacy instruction and that they could participate in shared reading.

Student Participant Independent Correct Responses to CAR and CROWD

As depicted in Figure 3 of Chapter 4, Student Participants responses to the CAR and CROWD (i.e., independent correct responses to listening comprehension questions) varied. All Student Participants demonstrated a stable baseline. During intervention, Student Participant 1 had a relatively increasing trend and Student Participant 2 demonstrated a relatively increasing trend with a slight decrease on the last two data points. Student Participant 3 maintained an increasing trend with no variability. During the maintenance phase, Student Participants 1 and 3 demonstrated a relatively increasing trend, while Student Participant 2 had an increasing trend with no variability. During the generalization phase, Student Participant 2 demonstrated a relatively decreasing trend and Student Participant 3 demonstrated an increasing trend. Note: the researcher only collected one data point during the generalization phase for Student Participant 1 and no trend could be established.

The variability in the data during the intervention phase aligns with the literature (e.g., Browder et al., 2011; Hudson and Browder 2014; Wood et al., 2015). For example, in 2007, Browder et al. trained teachers to help students with severe developmental disabilities to interact with grade appropriate literature. Browder and colleagues (2007) measured the number of independent correct student responses and data were displayed visually. Each student increased their independent correct responses; however, data were relatively variable throughout the dissertation phase. Shurr and Taber-Doughty (2012) investigated increasing comprehension for middle school students with moderate intellectual disability. They, too, measured comprehension accuracy across participants.

Visual display of students' data indicated each student increased their correct responses, but data were variable.

In this dissertation study, the researcher suspects the variability of Student Participant's independent correct responses was directly related to the number of Teacher Participant questions and OTRs, as well as Teacher Participant prompting. Additionally, the researcher only graphed independent correct Student Participant responses; therefore, if the Teacher Participant provided any type of prompt (e.g., verbal or gestural) the response was coded as incorrect. Although research exists that would have supported collecting data on other types of responses- independent incorrect, prompted correct, and prompted incorrect (see Browder et al., 2007)- the researcher was interested in Student Participants' ability to answer the questions correctly and independently.

Role of Text Genre

The structure and organizational features of text affects students' comprehension (see Risko, Walker-Dalhouse, Bridges, & Wilson, 2011), and genres of text serve various purposes. For example, narrative texts are designed to entertain the reader whereas expository text serve to inform the reader (Browder & Spooner, 2011). Additionally, narrative texts follow a simple structure that facilitates comprehension, while expository text tend to be more structurally complex and require more knowledge to comprehend (see Best, Floyd, and McNamara, 2008). Regardless of complexity level, "Teaching with a wide variety of text structures and images holds possibilities for deepening students' interest, engagement, and comprehension and enhancing the complexity of their compositions" (Risko et al., 2011, p. 378).

For these reasons, the researcher chose to use two different types of books in this dissertation study. A narrative text was read during baseline, intervention, and maintenance phases, and an expository book was used during the generalization phase. During the first three phases, results indicated Student Participants were highly engaged in the text, and they were able to answer Teacher Participant's questions; however, Also, for students with SID, chosen text should be age and grade level appropriate. Books were chosen from age and grade level reading lists and adapted as needed. In this dissertation study, the researcher chose books appropriate for shared reading (i.e., interactive), but these books may not have been age appropriate because they were not selected from a grade level reading list, which was not available. Despite the possibly flaws in the sected text, Student Participants struggled to answer questions and Teacher Participants decreased their amount of questions during the generalization phase. The researcher speculates change from a narrative to an expository text during the generalization phase caused the decrease in student correct responses and decrease in teacher questioning-thereby supporting the literature which indicates expository text may be more difficult to comprehend. Therefore, results of this study support the research that indicates text genre matters.

Opportunities to Respond and Questioning

During shared reading, there are many ways to interact with the text (e.g., touch, discussing pictures), but in this study, Teacher and Student Participants interacted with the text through questioning. When a teacher asked a question, it gave Student Participants an OTR. Also, teachers can ask a variety of question to help students

interact with the text and to assess student comprehension. In this study, Teacher Participants increased their OTRs, frequency, variety, and types of questions (individual and cluster) asked when they CROWD. Finally, because Teacher Participants provided more OTRs and asked a variety of questions, Student Participants increased their overall listening comprehension. These findings aligned with the literature on OTR, in which researchers recommended that teachers elicit four to six responses per minute from students when teaching new materials (Sutherland et al., 2003), and that increasing OTR positively effects the number of correct student responses (Sutherland et al., 2003).

Generalization of CAR and CROWD

Students with disabilities, specifically those with SID, have trouble generalizing skills- "the ability to apply skills in different environments or situations or under different circumstances from those were the skills were first learned" (Westling, Fox, & Carter, 2015, p. 157). These students especially have trouble generalizing newly acquired skills (Westling et al., 2015). Similarly, teachers often struggle generalizing content knowledge to classroom practice, such as information learned during a professional development (see Rock et al., 2011).

In this study, results for Teacher and Student Participants generalization aligned with the literature. In regards to OTRs, all three Teacher Participants decreased their mean rate of OTR from maintenance phase to the generalization phase. Additionally, Teacher Participants 2 and 3 decreased the amount of questions asked during the generalization phase. Since Student Participant responses were directly linked to the

number of OTRs and the number of questions asked, Student Participant independent correct responses also decreased during the generalization phase.

The researcher speculates that three major factors may have contributed to the overall decrease in Student Participant and Teacher Participant data during the generalization phase. First, during the generalization phase, Teacher Participants read an expository text; however, during the online module, they received no training or exemplars on how to implement the CAR and CROWD with an expository text. Second, Teacher Participants received no *e*Coaching during the maintenance or generalization phases. Third, Student Participants were only able to answer questions delivered by teachers.

In order to effectively generalize the CAR and CROWD to a different situation Stokes and Bauer (1977) identified several methods (e.g., train and hope). Of the nine methods researchers recommended, training using multiple exemplars has been used to education students with SID. In 2011, Hicks, Bethune, Wood, Cooke, and Mims used multiple exemplars and direct instruction to train students with intellectual disabilities to use and respond to preposition during a maintenance and generalization phase. Results of this study indicated that when given multiple exemplars, students were able to generalize this skill. Similarly, Spooner, Kemp-Inman, Ahlgrim-Delzell, Wood, and Davis (2013) taught students with severe disabilities to generalize literacy skills through portable technology and using multiple exemplars. Results indicated each student was able to generalize their literacy skills.

Although the studies conducted by Hicks et al. (2011) and Spooner et al. (2013) were geared toward students with SID, the results may be applied to Teacher Participants as well. Perhaps, providing Teacher Participants an additional module or an *e*Coaching booster session before entering the generalization phase would have helped them transfer their use of the CAR and CROWD to a different text. Alternatively, the researcher could have provided booster *e*Coaching during the generalization phase to increase Teacher Participants' use of the CAR and CROWD.

High Expectations for Students with SID

As mentioned in Chapter I, ESSA (2015) requires schools hold all students to high academic standards so that students graduate high school college and career ready. Specific to the area of literacy, Browder and colleagues (2009) state that every student should have the opportunity to learn to read and books should increase in complexity and expose students to real word knowledge (Chard & Osborn, 1999).

In this dissertation study, the Teacher Participants provided daily literacy instruction; however, as evidenced from their literacy goals (see Table 2), literacy instruction for these students with SID may have lacked rigor. For example, Student Participants' literacy goals included sitting and attending to a story for a designated length of time and identifying the letter of the alphabet. During the intervention and as Teacher Participants began asking more comprehension questions, Teacher Participants became shocked by each Student Participants' ability to attend to the story and answer questions. For example, during one *e*Coaching session, Teacher Participant 3 turned to the camera and whispered, "I am like so amazed right now!" She was amazed because

her student, Student Participant 3, was attending to the story and answering the comprehension questions correctly, and his problem behaviors were not present at that time. Teacher Participant 3's response further confirmed the need for higher expectations for literacy instruction for students and confirm that students with SID can participate, successfully, in rigorous literacy instruction (e.g., Browder et al. 2008).

Student Engagement

In this study, the researcher chose highly motivating texts for Teacher Participants to read during each phase of the study. Additionally, Teacher Participants engaged Student Participants in the story thorough questioning with the CROWD. As a result, Student Participants remained engaged during the study. In addition, Teacher Participants received *e*Coaching to facilitate their use of the CAR and CROWD through BIE technology and Skype. Results confirm the results of Rock et al. (2009) that *e*Coaching was not a distraction to teacher instruction or student learning.

Social Validity

Social validity assesses the overall importance and feasibility of a research study (Horner et al., 2005). The social validity results of this research support those of Rock et al. (2009; 2012; 2014). Teacher Participants in those studies reported positive experiences with the *e*Coaching. Social vality results of this dissertation study also support those of Coogle et al. (2015), Scheeler et al. (2012), and Ploessl and Rock (2014) because Teacher Participants reported the *e*Coaching was effective positively changing both Teacher and Student Participant dependent measures. In this dissertation study, Teacher Participants reported the *e*Coaching was not a distraction during classroom

instruction during the intervention phase. Also, 33% of Teacher Participants noted no noticeable changes in student's comprehension; however, her students' data confirmed a variable, increasing trend in comprehension. This may be due to the lack of progress monitoring and a need to show Student Participants' data to Teacher Participants.

Teacher Fidelity

De Fazio, Fain, and Duchaine (2011) note that treatment integrity is the extent to which an intervention is used correctly and as intended. Although valued as important, there is no established criteria for percentage of fidelity needed to determine if an intervention was used correctly (see Noell, Gresham, & Gansle, 2002). Additionally, Mowbray, Holter, Teague, and Bybee (2003) noted that treatment fidelity may need to vary based on intended goals and objectives.

In this dissertation study, Teacher Participant 3 had the lowest fidelity in her use of the CAR and CROWD, but her student (Student Participant 3) appeared to make the most gains in his comprehension. Not only do these data point to a need for progress monitoring to teachers can monitor changes in students' comprehension, but also led the researcher to question the percentage of fidelity and ask- How much fidelity is really enough? Under what circumstances should fidelity vary? Results of this study indicate that lower treatment fidelity may not be indicative of overall use. That said, of course, more research is needed.

Divergent Findings

Duration of Professional Development

According to Desimone (2009), effective professional development should include 20 hours or more of contact over time. In this dissertation study, Teacher Participants completed and online module and received follow-up *e*Coaching. Although the researcher did not collect data on the amount of time Teacher Participants took to complete the module or if the accessed the module multiple times throughout the study, she estimates the online module took 1-hour to complete. In addition to the online module, Teacher Participant 1 received approximately 1.5 hours of *e*Coaching, Teacher Participant 2 received approximately 1 hour of *e*Coaching, and Teacher Participant 3 received approximately 0.5 hours of *e*Coaching (Note: these figures are estimations).

Overall, the researcher provided about 3 hours of *e*Coaching across all three Teacher Participants, which falls below the recommended hours of contact time (Desimone, 2009), which means the Teacher Participants received a range of 1.5 hours to 2.5 hours of contact time during the professional development. Even though the contact time was less than the recommendations set by Desimone (2009), Teacher Participants were able to implement the CAR and CROWD during intervention, and they increased the amount and variety of questions asked during shared reading. These findings refute those of Desimone (2009) and suggest that teachers may not need 20 hours or more of contact time to effectively learn and implement a skill, especially when follow up *e*Coaching is provided. However, the researcher cautions against underestimating the

amount of time needed for participants to learn, master, and use new skills with fidelity during classroom instruction. Thus more work is needed.

Amount of OTRs During Instruction

As mentioned previously, researchers suggest providing four to six responses per minute during the instruction or new materials with 80% accuracy, and eight to twelve responses per minute with 90% accuracy during independent practice (see Sutherland et al., 2003). However, these guidelines were the first and only recommendations published and only refer to teachers of students with high incidence disabilities "teaching functional communication or basic fact concepts (e.g., letter and number identification) in a drill format (MacSuga-Gage & Simonsen, 2015). Also MacSuga-Gage and Simonsen also mention, these suggested guidelines may be too high during other various types of class-wide direct instruction.

Although, an increased rate of OTR has positive effects of student engagement and correct student responses (see Sutherland et al., 2008), for students with SID, more is not necessarily better. In this study, as Teacher Participants began providing more OTRs, Student Participants began to answer more questions correctly, but their percentage of independent correct responses did not consistently reach the recommended 80% or 90%. For example, during baseline, Teacher Participant 1 provided more OTRs in general than Teacher Participants 2 and 3, and her reading style differed (e.g., more interactive and asked more questions). Additionally, during baseline she asked mainly one type question when reading to her students (e.g., "What is this."). As she began to provide more OTRs during intervention, although variable, Student Participant 1's correct independent

responses increased; however, his mean percentage of correct responses was 24.01% (range = 7-50). This example suggests that as with everything in special education, providing OTRs must be individualized for each student. Additionally, increased OTR may also suggest that Teacher Participants were not providing ample wait time for students to process the information and answer the questions.

Limitations

In addition to the limitations identified in Chapter I, other limitations are associated with this single subject research study. First, in order to "Meet Evidence Standards" established by the WWC (Kratochwill et al., 2010), the research design must have included six phases with at least five data points per phase; however, since Teacher Participant 1 left the school prior to completing the generalization phase, the researcher failed to meet evidence standards during the generalization phase. Specifically, the generalization phase for Teacher Participant 1 *met standards with reservation.* Second, baseline stability was another limitation. Due to time constraints, Teacher Participant 1 entered intervention with a variable baseline and Teacher Participant 2 entered on an an ascending trend. Third, the setting of the research study was a limitation. All three Teacher Participants were located in the same school, their classrooms were located in the same section of the school, they shared the same technology throughout the study, and they were often in and out of each other's classroom during their scheduled literacy times. The researcher speculates that the setting may have affected baseline data for all Teacher Participants. Fourth, the researcher coded student engagement using interval recording during 2-minute intervals. Therefore, based on the definition provided in

Chapter I, data on student disengagement were not captured. Fifth, although the researcher collected data on Teacher and Student Participant dependent measures, Teacher Participants did not collect data on Student Participants' comprehension outcomes. Thus, the lack of progress monitoring was a limitation.

Implications for Future Research

There are several implications for future research on comprehension instruction for students with SID that stem from this study. First, researchers should investigate the rate of OTR needed to encourage student engagement, to assess comprehension, and to monitor students' progress. Second, researchers should continue to investigate the use and variety of questions asked during shared reading. Third, researchers should investigate comprehension strategy instruction for students with SID. Forth, researchers should continue to investigate technology enabled approaches to teacher development.

First, the available literature on OTR includes students without disabilities or those with high incidence disabilities (see MacSuga-Gage & Simonsen, 2015) and no research exists involving students with SID. As mentioned in Chapter I, students with SID often require accommodations and modifications to access the lesson content, and results of this study indicate that the current rate of OTR provided in the literature may not be the optimal rate for students with SID. Additionally, researchers should embed progress monitoring in future investigations to help teachers make decisions regarding student performance. Therefore, researchers should continue to investigate the optimal rate of OTR that continues to encourage student engagement, but also provides enough opportunities for teachers to assess learning.

Second, researchers should investigate the use of questions during shared reading and the variety of questions asked. Questioning plays a critical role during shared reading because it provides one opportunity for teachers or adult readers to encourage student interaction with the text. In this dissertation study, Teacher Participants learned how to ask a variety of questions using the CROWD. Additionally, Teacher Participants received *e*Coaching on the type of questions (i.e., higher order vs. lower order) to ask teachers. Despite receiving *e*Coaching, Teacher Participants continued to ask mainly "what" questions that required a literal response from Student Participants. Therefore, researchers need to continue to investigate the best way to encourage teachers during the online module plus *e*Coaching to ask higher order questions during shared reading that encourage higher order thinking skills for students with SID.

Third, in this study, Teacher Participants used teacher-directed mnemonic strategies to help students comprehend text through questioning. In the literature, the majority of the research involving mnemonic strategies and questioning are student directed (e.g., Wood et al., 2015), involve students with high incidence disabilities (see Berkeley et al., 2010), or involved students without disabilities (see NRP, 2000). Future researchers should focus on effective strategies to use during comprehension instruction for students with SID.

Fourth, researchers should continue to investigate technology enabled approaches to teacher development. In this dissertation study, none of the Teacher Participants received a degree (e.g., through a traditional undergraduate program, master's program, or alternative licensure) in education or special education. Additionally, there is a limited

amount of research and resources available to help teachers provide literacy instruction. In this dissertation study the setting was a private school which has requirements that differ from those of county schools. Because of these differing requirements and limited amount of research, researchers should further investigate the quality and type education teachers of students with SID receive and how their teacher development can be enhanced by technology.

Implications for Practice

Also, the researcher recommends several implications for practice. First, teachers may want to consider the types and levels of questions they ask during shared reading. The CROWD strategy helps adult readers remember the types of questions to ask during shared reading (Whitehurst et al., 1994). By asking a variety of questions teachers can assess which types or levels of questions are weaknesses and strengths for students. Second, teachers may want to consider using the CAR and CROWD during planning. Not only can the CROWD be used during shared reading, but also practitioners should use the CROWD during planning and adapting materials. Since students with SID may need adapted text for literacy instruction (Browder & Spooner, 2011), practitioners should also use the CROWD while planning the types of questions to include in adapted text. By doing this, they can ensure that students are asked a variety of questions that encourage higher order and lower order thinking. Additionally, by using the CROWD during planning of instruction, practitioners can vary study response modes, if needed (e.g., pictures for responding; Browder & Spooner, 2011). Finally, when selecting books to use during shared reading, teachers should select books carefully. Not only should

they use their student current reading level, age, and interests, they should also consider the text genre. As indicated by the result of this study, text genre makes a difference in the frequency and variety of questions asked, which may impact OTRs for students.

Future Directions

The CAR and CROWD are two examples of mnemonic strategies that encourage question answering and have been proven effective for increasing comprehension in students without disabilities (NRP, 2000). Although proven effective for students without disabilities and with those who have high incidence disabilities (Berkeley et al., 2010), results of this study suggest that the use of mnemonic strategies, specifically the CAR and CROWD may be effective for students with SID.

The limitations of this study confirm further replication and investigation should be conducted. For instance, future investigations should strive for a larger sample size of teacher participants. Additionally, researchers should extend the intervention (i.e., online module plus *e*Coaching) to investigate and encourage longer lasting acquisition of the newly acquired skills.

Finally, future investigations should be conducted (e.g., component analysis), to tease out which element of the intervention- online module or *e*Coaching was more effective. Although Teacher Participants rate the online module and the *e*Coaching were both beneficial, the researcher collected no data on which of the components was more effective in altering Teacher Participants' use of the CAR and CROWD.

Conclusion

Fifty-one years after the passage of ESEA and 32 years after Ann Donnellan introduced the criterion of the least dangerous assumption researchers are still searching for effective ways to provide literacy instruction to students with SID. As the field of special education shifts from providing a functional/developmental curriculum to providing more academic instruction, providing comprehension instruction continues to be an even greater challenge. However, since the US has a national focus on improving literacy outcomes for *all* students, those who teach students with SID must have access to quality professional development and ongoing support as they transform their literacy instruction to include more complex concepts, such as comprehension. The results of this study, although preliminary, confirmed the efficacy of on online module plus *e*Coaching as effective way to support in-service teachers as they begin to provide comprehension instruction to students with SID.

Literacy for all students is a priority of US education, including those with SID. Therefore, researchers and practitioners are called to discover and use effective evidence-based strategies during literacy instruction. Specific to this dissertation study, as researchers continue to investigate the most effective strategies to use during comprehension instruction for students with SID and as teachers begin to implement these strategies, educational and life outcomes are sure to improve for this population.

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APPENDIX A

DISSERTATION CODEBOOK

Coach Feedback		
Instructing/ Correcting	**Full Definition**	"Objective information related to predetermined specific teaching behaviors" (Rock et al., 2012, 2009; Scheeler et al., 2004, p.399)
	Brief Definition	Coach makes teacher aware of error when using CAR or CROWD and provides a specific way to correct the error
	Example	"Try asking the recall question again and provide a physical prompt."
	Non-example	"You forgot something."
Encouraging	**Full Definition**	"Praise contingent on demonstration of a specific teaching behavior" (Rock et al., 2012, 2009; Scheeler et al., 2004, p.399)
	Brief Definition	Coach praises teacher for using the CROWD or CAR strategy
	Example	"Excellent use of the CROWD strategy to as students to recall information."
	Non-example	"Great job."
Questioning	**Full Definition**	"A sentence posed in interrogative form to get information or to clarify specific teaching behaviors" (see Rock et al., 2009)
	Brief Definition	Coach asks a clarifying question
	Example	"What was your student's answer to the question?"
	Non-example	"You forgot something."
Questioning		
Higher Order	**Definition**	A question that requires that a student understand the relationship between a fact or piece of knowledge within the greater context of the situation. (http://cet.usc.edu/resources/teaching_learning/docs/Asking_Better_Questions.pdf)

Lower Order	**Definition**	Requires the student to simply recall a single fact. (http://cet.usc.edu/resources/teaching_learning/docs/Asking_Better_Questions.pdf)
Student Dependent Variables		
Student Engagement	**Definition**	"Target student (a) attending to (i.e., looking at) the teacher, (b) making appropriate motor responses (e.g., following directions, manipulating materials), (c) asking for assistance in an appropriate manner, and (d) interacting with peers or adults within the structure of the activity." (Courtade, Lingo, & Whitney, 2013, p,9)
	Example	Listening to the teacher, pointing appropriately to objects, showing a peer his/her project, and responding to teacher questions (Courtade, Lingo, & Whitney, 2013, p,9)
	Non-example	Non-examples of AET were running around the room, showing defiance to teacher requests, engaging in inappropriate use of materials, and not looking at or attending to the teacher. (Courtade, Lingo, & Whitney, 2013, p,9)
Student Disengagement	**Definition**	Target student looking away from teacher, manipulating materials appropriately, interacting with peers or adults outside of the activity structure for 30 seconds or more.
	Example	Student looking away from teacher and book, screaming, and/or participating in stimulatory behavior for 30 seconds or more.
	Non-example	Student participating in stimulatory behavior while answering questions about the book.
Independent, correct responses to comprehension questions	**Definition**	Student answers questions correctly without any verbal, physical, or gestural assistance from the teacher.
	Example (verbal)	Teacher Question: Who's coming down the path? Student Answer: The fox. (without physical, gestural, or verbal prompting)
	Example (gestural)	Teacher Question: Who's coming down the path? Student Answer: The fox. (teacher point to fox on the page)
	Example (physical)	Teacher Question: Who's coming down the path? Student Answer: The fox. (teacher grabs student's hand and helps student point to the fox)

	Non-example (verbal)	Teacher Question: Who's coming down the path? The f…. (says beginning sound of fox) Student Answer: The fox. (teacher provides praise afterwards)
	Non-example (gestural)	Teacher Question: Who's coming down the path? (teacher holds the book so student can see) Student Answer: The fox.
	Non-example (physical)	Teacher Question: Who's coming down the path? (teacher helps student hold the book) Student Answer: The fox.
CAR Prompt		
Comment and Wait	**Definition**	Teacher makes a comment and waits for student's response.
Ask Questions and Wait	**Definition**	Teacher asks a question using the CROWD questioning prompt and waits for student's response.
Respond by Adding a Little More	**Definition**	Teacher responds to student's responses by adding more, providing specific praise, or asking another question using the CROWD questioning prompt.
CROWD Teacher Questioning Prompt		
Completion	**Definition**	Student completes the statement asked by the teacher.
Recall	**Definition**	Teacher explicitly asks student to remember something about the story or from the story. For example, teacher may ask, "Do you remember who this story is about?"
Open-ended	**Definition**	Teacher asks student a question without an explicit or implicit answer.
WH	**Definition**	Teacher ask a who, what, where, when, why, or how question.
Distancing	**Definition**	Teacher asks the student to relate a portion of the story to a real life situation. For example, have you ever eaten a donut?
Questioning Level and Type		
Literal (lower order)	**Definition**	Readers pick out main ideas, sequence details, notice similarities and differences, and identify explicitly stated reasons.
Inferential (higher order)	**Definition**	Readers use clues in the text, implied information, and their background knowledge to draw inferences.

Critical (higher order	**Definition**	Readers analyze symbolic meanings, distinguish fact from opinion, and draw conclusions.
Evaluative (higher order)	**Definition**	Readers judge the value of text using generally accepted criteria and personal standards. They detect bias, identify faulty reasoning determine the effectiveness of persuasive techniques, and assess the quality of a text.
Other Definitions		
Shared Reading	**Definition**	A method of reading typically used for young children (Coyne, Simmons, Kame'enui, & Stollmiller, 2004) that fosters literacy concepts such as print awareness, phonological awareness, alphabetic knowledge, and metalinguistic awareness (Justice & Kadervak, 2002). Shared reading is an evidence-based practice for promoting literacy for students with SID that involves reading a story aloud to a student and providing support for the student to interact with the reader about the story (Hudson & Test, 2011), such as through questioning.
Opportunities to Respond (OTR)	**Definition**	An *opportunity to respond* (OTR) is a teacher behavior that prompts or solicits a student response (e.g., asking a question, presenting a demand). Simonsen et al. (2008). For this study, now wait time is needed. For this purposes of this study, question are categorized as clarification/extension questions (questions on the same topic) or separate questions (questions on different topics). See examples below.
	1 QTR Example	Teacher Question: Who's coming down the path? Who is this?
	2 QTR Example	Teacher Question: Who's coming down the path? Why is the owl flying away?

APPENDIX B

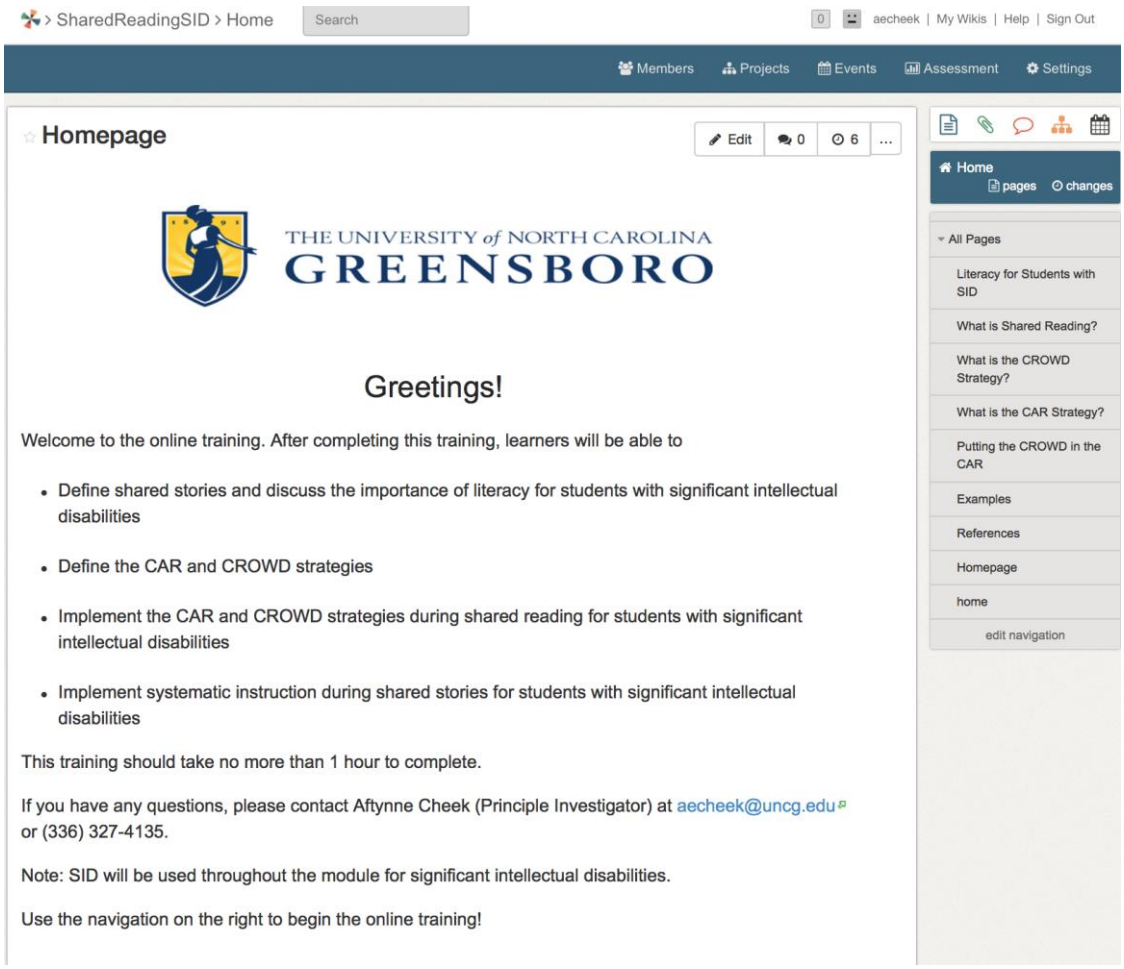
LEVELS OF THINKING IN COMPREHENSION AND EXAMPLES WITH THE CROWD QUESTIONING PROMPT

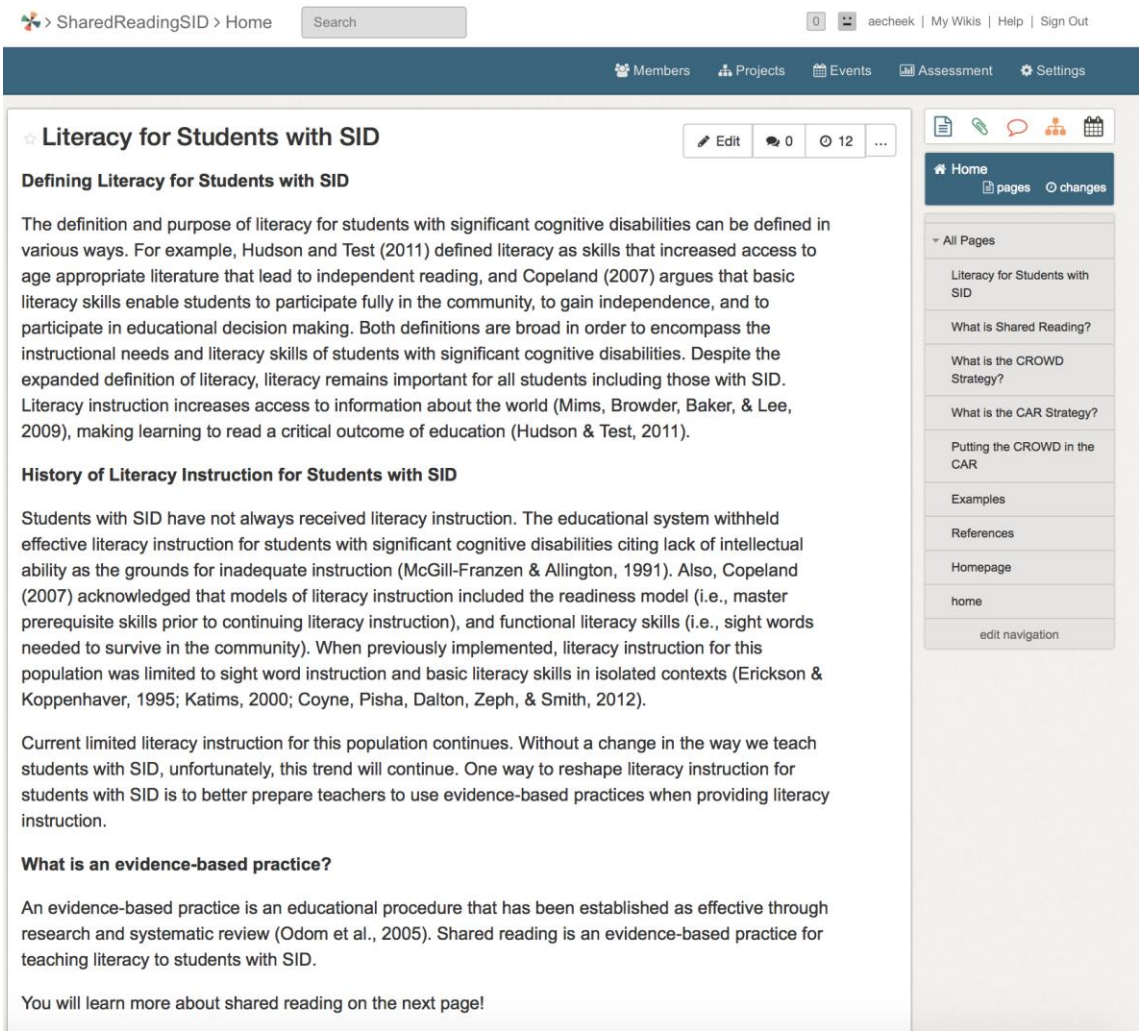
	Lower Order	Higher Order		
	Literal	**Inferential**	**Critical**	**Evaluative**
Definitions	Readers pick out main ideas, sequence details, notice similarities and differences, and identify explicitly stated reasons	Readers use clues in the text, implied information, and their background knowledge to draw inferences	Readers analyze symbolic meanings, distinguish fact from opinion, and draw conclusions	Readers judge the value of text using generally accepted criteria and personal standards. They detect bias, identify faulty reasoning, determine the effectiveness of persuasive techniques, and assess the quality of a text
Completion	"Terrible, horrible, no good, very bad, _____."	Something went bump, that made us_____?	Let's put the story in order. First, John _____. Second, John _____. Third, John _____.	What were the three things the author wanted us to learn from this article?
Recall	Can you remember what happened to John at school?		Can you remember why John got in trouble?	Think back to John's story. Can you remember the facts he told his mom about getting in trouble?

Open-ended	What animals you see on this page?	What do you think is happening on this page?	What animals on this page to you think would live in this environment?	What will happen to the animals if it does not rain?
WH & How	Who loved his home?	Who could help John?	Who do you think will come to help John?	Who else do you think John could have contacted?
	What is this called?	What do you think John will do after breakfast?	What is the same and different about these two animals?	What's the author's opinion?
	Where is John's book?	Where could John have left his book?	In your opinion, where do you think John left his book?	Was the story in this book real or not real?
	Why is John cold?	Why is John sad?	Why do you think John is sad?	Why did the author write this?
	How did John get to school?	How did John feel?	How is your opinion about John different than his best friend in the story?	How do you think the author came up with the idea for this story?
Distancing			Have you ever played in the snow like John? What did it feel like?	How would you feel if you were John?

APPENDIX C

ONLINE MODULE SCREENSHOTS

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What is Shared Reading?
What is the CROWD Strategy?
What is the CAR Strategy?
Putting the CROWD in the CAR
Examples
References
Homepage
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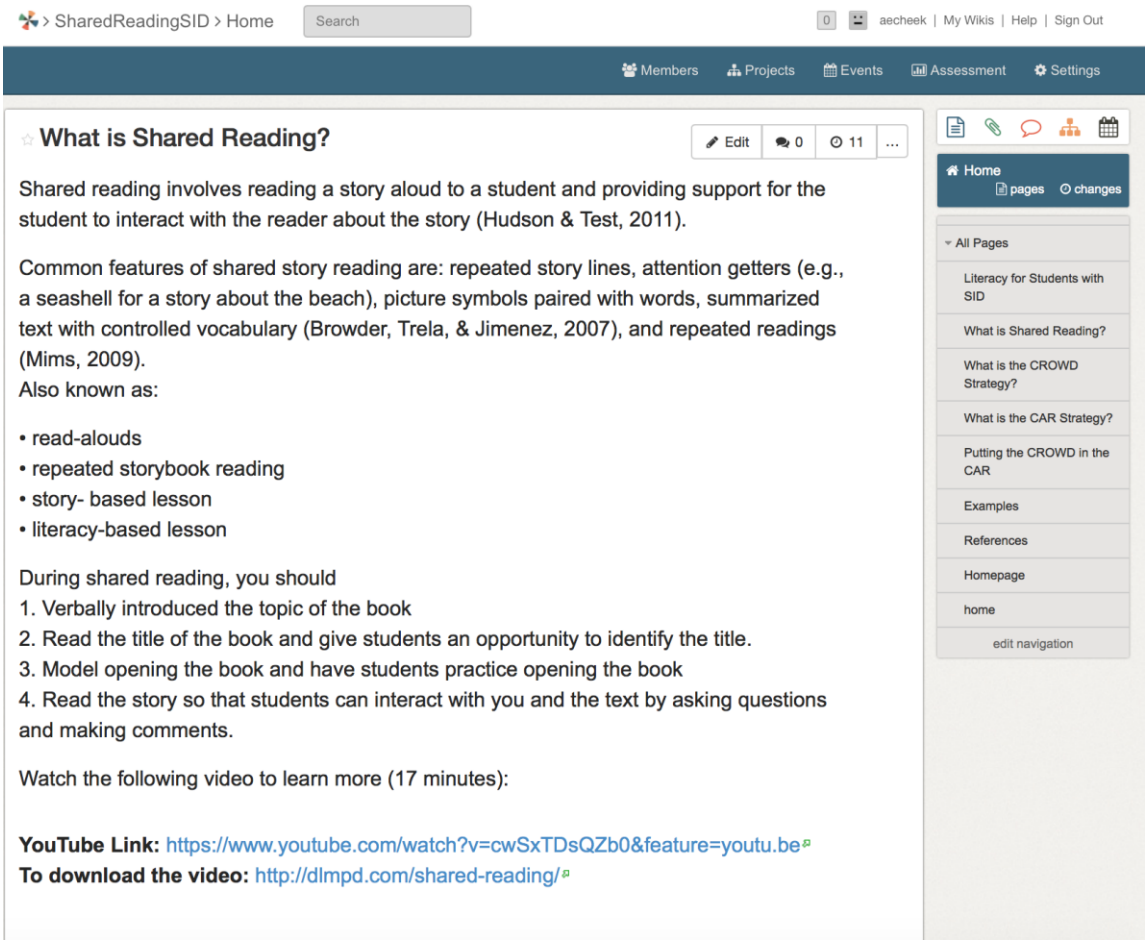
Defining Literacy for Students with SID
The definition and purpose of literacy for students with significant cognitive disabilities can be defined in various ways. For example, Hudson and Test (2011) defined literacy as skills that increased access to age appropriate literature that lead to independent reading, and Copeland (2007) argues that basic literacy skills enable students to participate fully in the community, to gain independence, and to participate in educational decision making. Both definitions are broad in order to encompass the instructional needs and literacy skills of students with significant cognitive disabilities. Despite the expanded definition of literacy, literacy remains important for all students including those with SID. Literacy instruction increases access to information about the world (Mims, Browder, Baker, & Lee, 2009), making learning to read a critical outcome of education (Hudson & Test, 2011).
History of Literacy Instruction for Students with SID
Students with SID have not always received literacy instruction. The educational system withheld effective literacy instruction for students with significant cognitive disabilities citing lack of intellectual ability as the grounds for inadequate instruction (McGill-Franzen & Allington, 1991). Also, Copeland (2007) acknowledged that models of literacy instruction included the readiness model (i.e., master prerequisite skills prior to continuing literacy instruction), and functional literacy skills (i.e., sight words needed to survive in the community). When previously implemented, literacy instruction for this population was limited to sight word instruction and basic literacy skills in isolated contexts (Erickson & Koppenhaver, 1995; Katims, 2000; Coyne, Pisha, Dalton, Zeph, & Smith, 2012).
Current limited literacy instruction for this population continues. Without a change in the way we teach students with SID, unfortunately, this trend will continue. One way to reshape literacy instruction for students with SID is to better prepare teachers to use evidence-based practices when providing literacy instruction.
What is an evidence-based practice?
An evidence-based practice is an educational procedure that has been established as effective through research and systematic review (Odom et al., 2005). Shared reading is an evidence-based practice for teaching literacy to students with SID.
You will learn more about shared reading on the next page!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Shared reading involves reading a story aloud to a student and providing support for the student to interact with the reader about the story (Hudson & Test, 2011).
Common features of shared story reading are: repeated story lines, attention getters (e.g., a seashell for a story about the beach), picture symbols paired with words, summarized text with controlled vocabulary (Browder, Trela, & Jimenez, 2007), and repeated readings (Mims, 2009).
Also known as:
• read-alouds
• repeated storybook reading
• story- based lesson
• literacy-based lesson
During shared reading, you should
1. Verbally introduced the topic of the book
2. Read the title of the book and give students an opportunity to identify the title.
3. Model opening the book and have students practice opening the book
4. Read the story so that students can interact with you and the text by asking questions and making comments.
Watch the following video to learn more (17 minutes):
YouTube Link: https://www.youtube.com/watch?v=cwSxTDsQZb0&feature=youtu.be
To download the video: http://dlmpd.com/shared-reading/
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What is the CAR Strategy?
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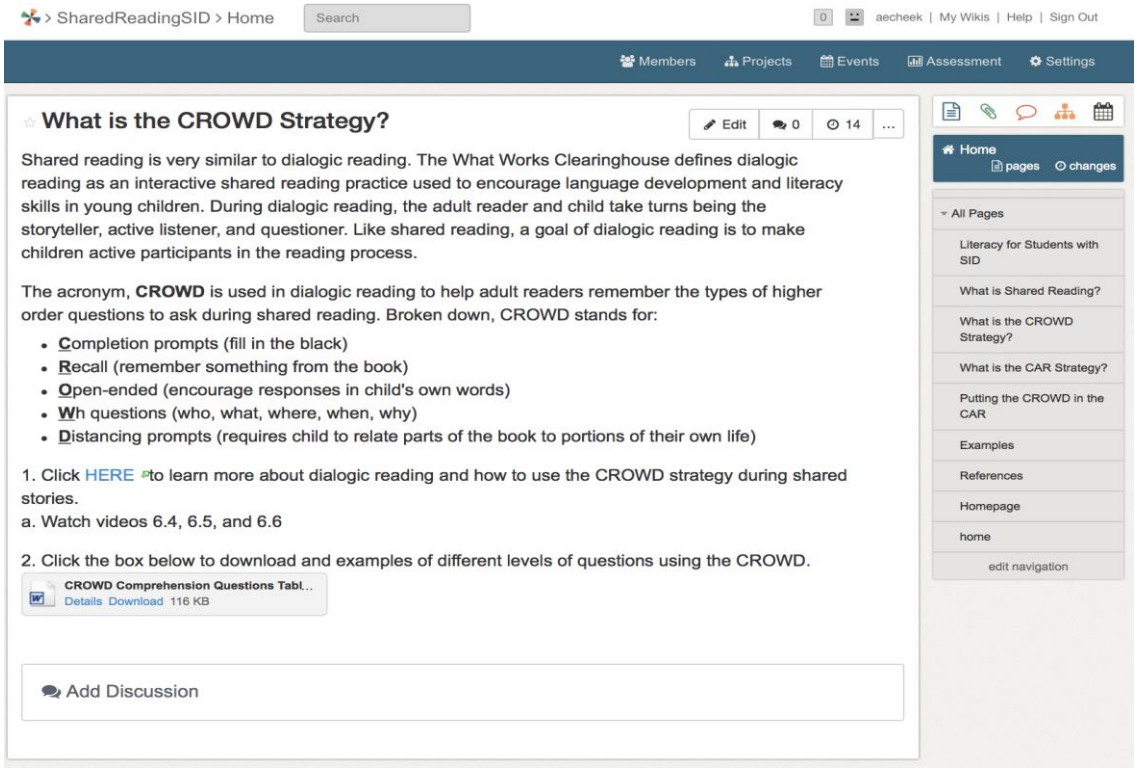
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Shared reading is very similar to dialogic reading. The What Works Clearinghouse defines dialogic reading as an interactive shared reading practice used to encourage language development and literacy skills in young children. During dialogic reading, the adult reader and child take turns being the storyteller, active listener, and questioner. Like shared reading, a goal of dialogic reading is to make children active participants in the reading process.
The acronym, CROWD is used in dialogic reading to help adult readers remember the types of higher order questions to ask during shared reading. Broken down, CROWD stands for:
Completion prompts (fill in the black)
Recall (remember something from the book)
Open-ended (encourage responses in child's own words)
Wh questions (who, what, where, when, why)
Distancing prompts (requires child to relate parts of the book to portions of their own life)
1. Click HERE to learn more about dialogic reading and how to use the CROWD strategy during shared stories.
a. Watch videos 6.4, 6.5, and 6.6
2. Click the box below to download and examples of different levels of questions using the CROWD.
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Details Download 116 KB
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What is the CAR Strategy?
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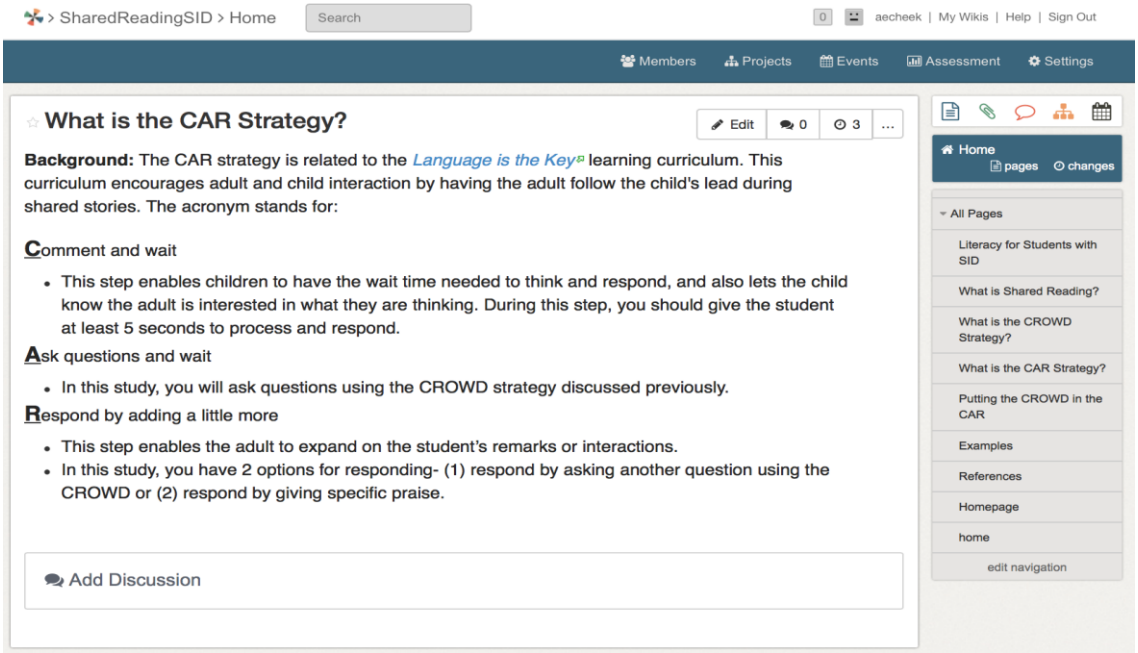
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Background: The CAR strategy is related to the Language is the Key learning curriculum. This curriculum encourages adult and child interaction by having the adult follow the child's lead during shared stories. The acronym stands for:
Comment and wait
This step enables children to have the wait time needed to think and respond, and also lets the child know the adult is interested in what they are thinking. During this step, you should give the student at least 5 seconds to process and respond.
Ask questions and wait
In this study, you will ask questions using the CROWD strategy discussed previously.
Respond by adding a little more
This step enables the adult to expand on the student's remarks or interactions.
In this study, you have 2 options for responding- (1) respond by asking another question using the CROWD or (2) respond by giving specific praise.
Add Discussion
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Literacy for Students with SID
What is Shared Reading?
What is the CROWD Strategy?
What is the CAR Strategy?
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Putting the CROWD in the CAR

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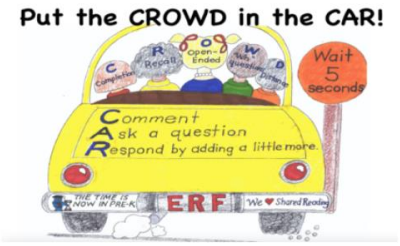

The file below will help you use the CROWD and CAR strategies during shared stories for students with SID.

CAR and CROWD Visual cue 6.19....
Details Download 108 KB

Note: You may download and use this visual during the remainder of the study.

Use this Handout to help you create your questions.

While using the CROWD and CAR strategies during shared stories

1. Create the questions you will ask your student throughout the story.
2. Determine the appropriate response mode for your student. The response mode is the mode your student does independently the majority of the time. Examples of response modes include eye gaze, point to, pull off, picture choices, AAC device, etc.).
3. Read the story and interact with your student.

This handout will provide you with more information! **Shared Reading_Handout.pdf**
Details Download 451 KB

Home
pages changes
All Pages
Literacy for Students with SID
What is Shared Reading?
What is the CROWD Strategy?
What is the CAR Strategy?
Putting the CROWD in the CAR
Examples
References
Homepage
home
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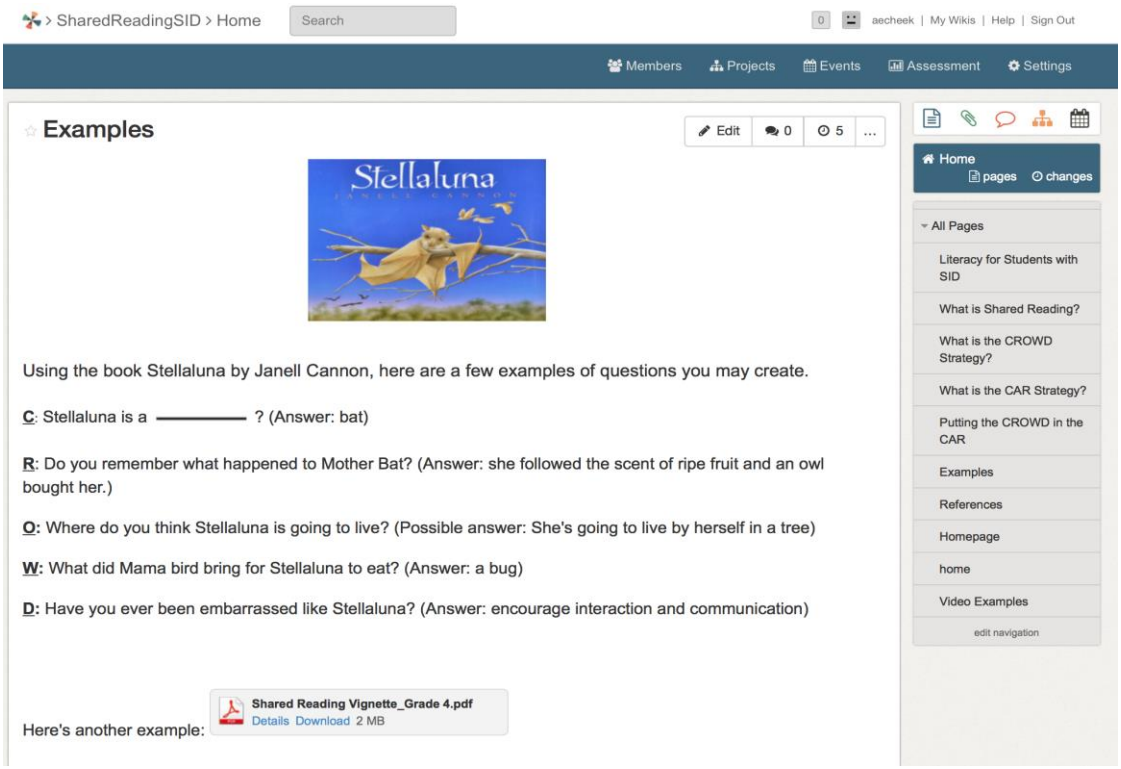
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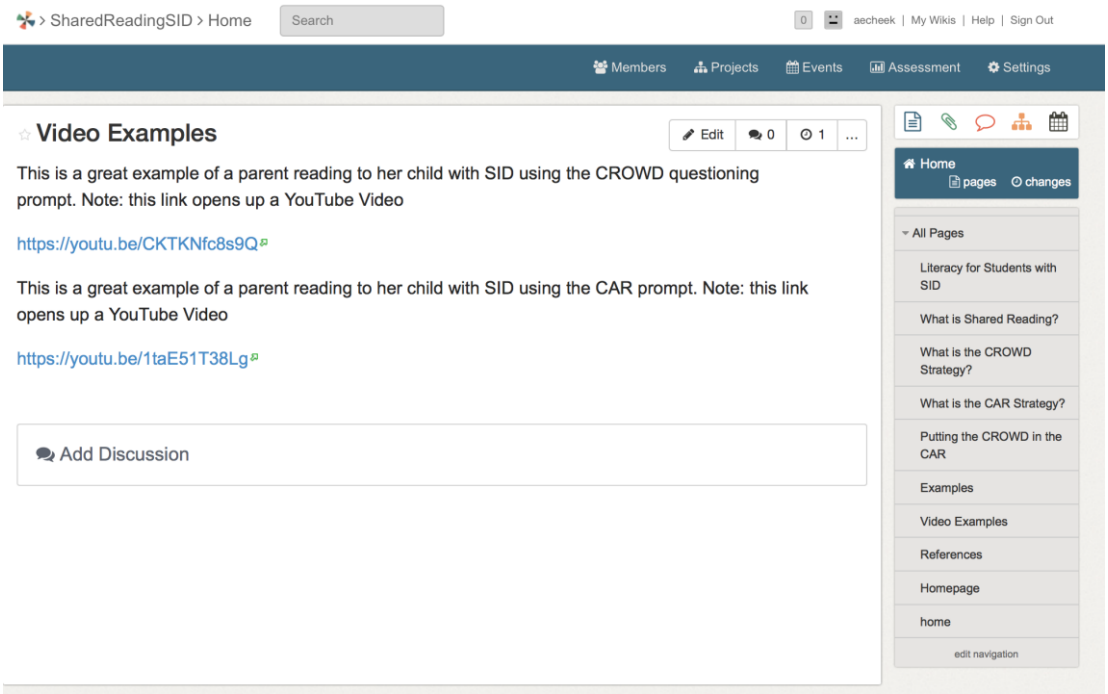
5
Stellaluna
Using the book Stellaluna by Janell Cannon, here are a few examples of questions you may create.
C: Stellaluna is a _____ ? (Answer: bat)
R: Do you remember what happened to Mother Bat? (Answer: she followed the scent of ripe fruit and an owl bought her.)
O: Where do you think Stellaluna is going to live? (Possible answer: She's going to live by herself in a tree)
W: What did Mama bird bring for Stellaluna to eat? (Answer: a bug)
D: Have you ever been embarrassed like Stellaluna? (Answer: encourage interaction and communication)
Here's another example:
Shared Reading Vignette_Grade 4.pdf
Details Download 2 MB
Home
pages
changes
All Pages
Literacy for Students with SID
What is Shared Reading?
What is the CROWD Strategy?
What is the CAR Strategy?
Putting the CROWD in the CAR
Examples
References
Homepage
home
Video Examples
edit navigation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1
This is a great example of a parent reading to her child with SID using the CROWD questioning prompt. Note: this link opens up a YouTube Video
https://youtu.be/CKTKNfc8s9Q
This is a great example of a parent reading to her child with SID using the CAR prompt. Note: this link opens up a YouTube Video
https://youtu.be/1taE51T38Lg
Add Discussion
Home
pages
changes
All Pages
Literacy for Students with SID
What is Shared Reading?
What is the CROWD Strategy?
What is the CAR Strategy?
Putting the CROWD in the CAR
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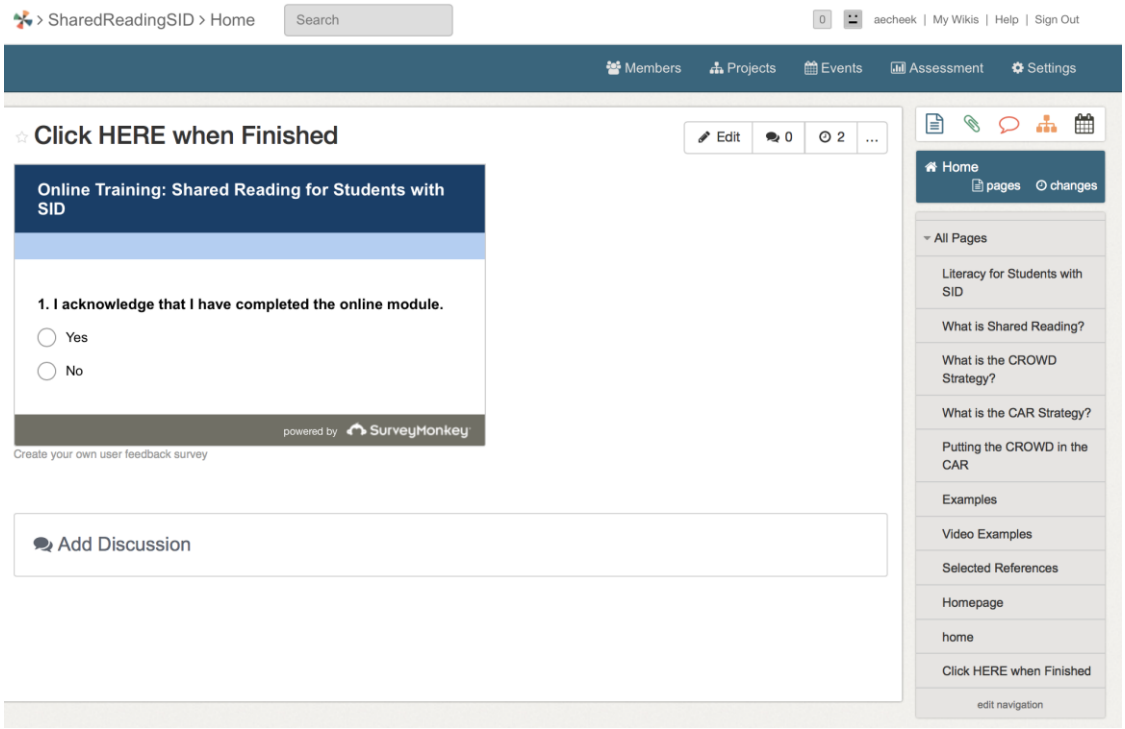
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2
Online Training: Shared Reading for Students with SID
1. I acknowledge that I have completed the online module.
Yes
No
powered by SurveyMonkey
Create your own user feedback survey
Add Discussion
Home
pages
changes
All Pages
Literacy for Students with SID
What is Shared Reading?
What is the CROWD Strategy?
What is the CAR Strategy?
Putting the CROWD in the CAR
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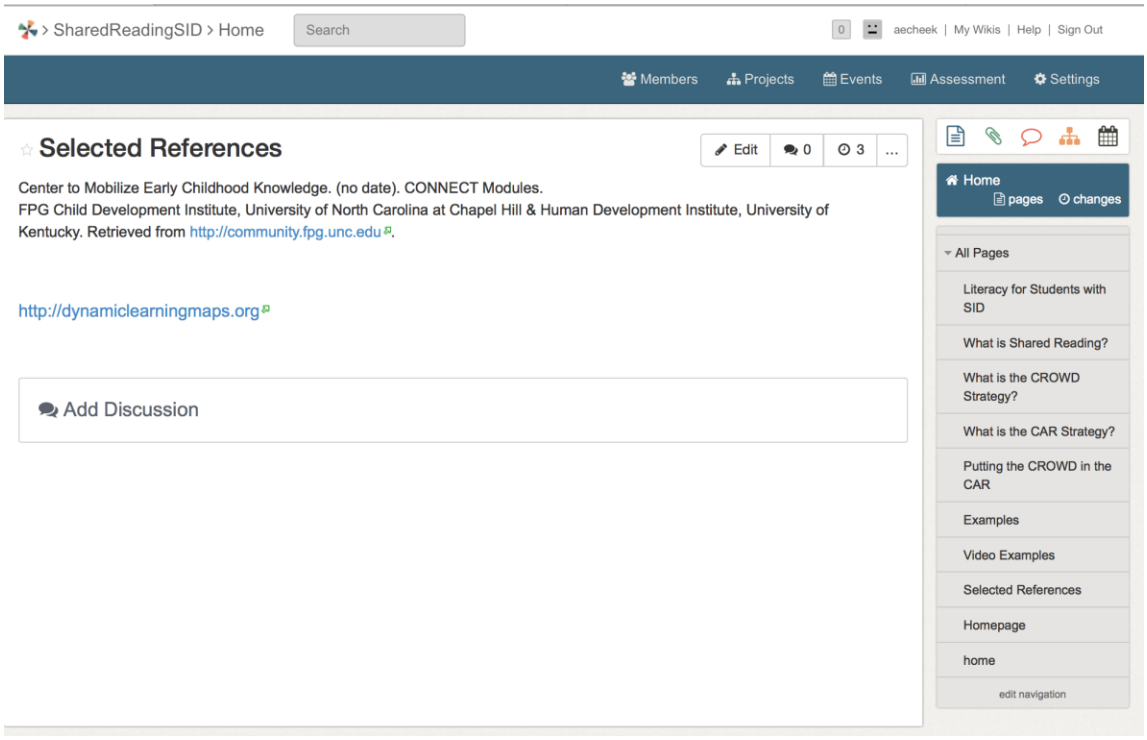
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Center to Mobilize Early Childhood Knowledge. (no date). CONNECT Modules.
FPG Child Development Institute, University of North Carolina at Chapel Hill & Human Development Institute, University of Kentucky. Retrieved from http://community.fpg.unc.edu.
http://dynamiclearningmaps.org
Add Discussion
Home
pages
changes
All Pages
Literacy for Students with SID
What is Shared Reading?
What is the CROWD Strategy?
What is the CAR Strategy?
Putting the CROWD in the CAR
Examples
Video Examples
Selected References
Homepage
home
edit navigation

Online Module Assessment Questions
https://www.surveymonkey.com/r/FL63D3X

1. Shared reading is defined as

- reading that involves reading a story aloud to a student and providing support for the student to interact with the reader about the story
- reading to a student in a way that does not allow interaction with the story
- having a student read aloud to an adult

2. All the the following are components of shared reading except

- Verbally introduce the topic.
- Read the title of the book and give students an opportunity to identify the title.
- Model opening the book and have students practice opening the book.
- Read the story so that students can interact with you and the text by asking questions and making comments.
- Not interacting with the students.

3. Each letter of the CROWD stands for

- comment, remember, open-ended, wh- questions, distancing
- completion, recall, open-ended, wh- questions, distancing
- completion, retell, open-ended, why questions, depth

4. What does the CROWD strategy help adult readers to remember?

- the amount of questions to ask during shared reading
- how to ask questions during shared reading
- the types of questions to ask during shared reading

5. If a teacher asks students to respond to the statement below, what type of prompt/question did she use? "Terrible, horrible, no good, very bad _____."

- completion prompt
- open-ended question
- distancing question

6. If the teacher asks: "Do you remember what happened to Suzy?" What type of question is this?

- completion
- open-ended
- recall

7. What do each each letter of the CAR stand refer to?

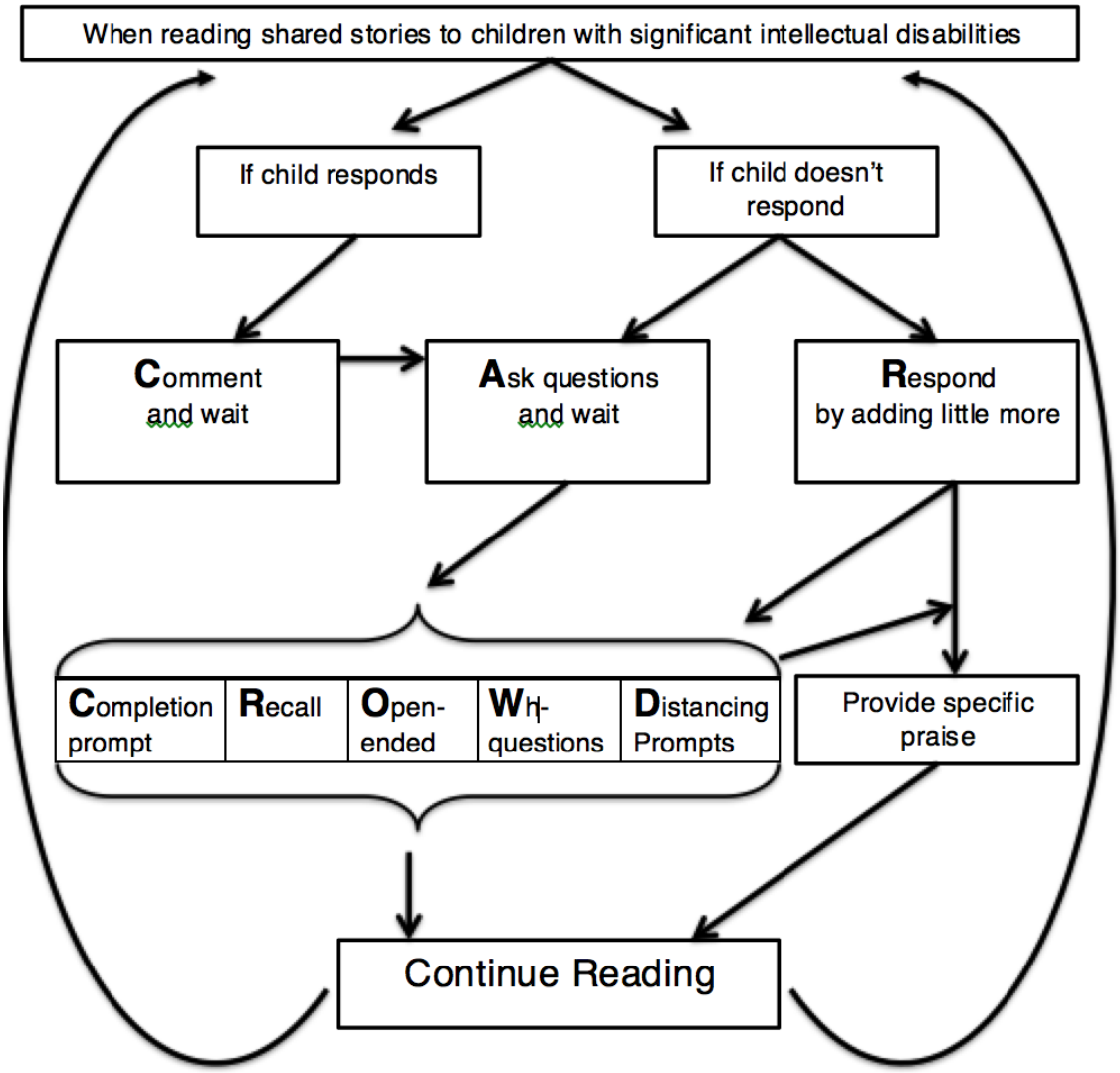
- comment and wait, ask questions and wait, respond by adding a little more
- comment and wait, add more to the statement, respond with correct of incorrect
- complete the sentence, ask questions and wait, reply to the student

8. For the "A" in the CAR strategy, what will you do in this study?

- wait for the student to comment
- ask a question using the CROWD
- provide praise

APPENDIX D

CAR AND CROWD VISUAL



APPENDIX E

DATA COLLECTION INSTRUMENTS

Participant:_____ **Date:_____**

Phase: Baseline Intervention Maintenance Generalization **Session#:_____**

Coaching Delivery	Frequency
Encouraging	
Instructing/Correcting	
Questioning	

Teacher and Student Questioning Data Sheet

Teacher/ Participants: _____ Date: _____ Phase (circle one): Baseline Intervention Maintenance Generalization Session#: _____

Time of Question	Question	CROWD Question					Level	Higher Order/ Lower Order	Student Independent Correct Response (Y/N)	Student Response Mode

Totals: OTR:_____ Mean Rate OTR:_____ Total # of Questions:_____ Lower Order: _____ Higher Order:_____

Student Independent Correct: _____

C: ____ R:____ O:____ W1:___ W2:___ W3:___ W4:___ W5:___ H6:___ D:___ Non-CROWD:___ Literal:___ Inferential:___

Teacher Fidelity

Participant: _____ **Date: _____**

Phase: Baseline Intervention Maintenance Generalization **Session#:_____**

Teacher Fidelity * Adapted from Browder et al., (2007), Mucchetti (2013), Roberts and Leko (2013)	
Teacher Action	**Occur (+) or Not Occur (-)**
Teacher verbally introduced the topic of the book	
Teacher read the title of the book and gave at least one student the opportunity to point to title. -or- Teacher gave at least one student the opportunity to read the title of the book out loud.	
Teacher modeled opening the book and gave at least one student the opportunity to open the book. -or- Teacher gave at least one student the opportunity to open the book.	
Total %	**_____/3 = _____%**
Teacher read the story using a shared reading format (embedded questions).	
Teacher asked comprehension questions throughout the text using the CAR prompt and CROWD questioning prompt	
Total %	**_____/3 = _____%**

Interval Time Sampling Data Sheet
Student Engagement

Student Participant:_____ Date: _____ Session#:_____

Phase (circle): Baseline Intervention Maintenance Generalization

(Record a + or – if the behavior of student engagement occurs any time during the interval)

Intervals	+/ -	Comments/Notes
2 min		
4 min		
6 min		
8 min		
10 min		
12 min		
14 min		
16 min		
18 min		
20 min		
Definition: student attending to (i.e., looking at) the teacher, making appropriate motor responses (e.g., following directions, manipulating materials), asking for assistance in an appropriate manner, and interacting with peers or adults within the structure of the activity" (Courtade, Lingo, & Whitney, 2013, p. 9)		

APPENDIX F

SOCIAL VALIDITY SURVEY

Directions: Read the following statements and choose the answer that indicates your level of agreement of disagreement with the statement.

Q1 The online module on the CAR prompt and CROWD questioning prompt was accessible.

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neither Agree nor Disagree
- ❍ Disagree
- ❍ Strongly Disagree

Q2 The online module on the CAR prompt and CROWD questioning prompt was practical.

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neither Agree nor Disagree
- ❍ Disagree
- ❍ Strongly Disagree

Q3 The online module on the CAR prompt and CROWD questioning prompt was useful.

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neither Agree nor Disagree
- ❍ Disagree
- ❍ Strongly Disagree

Q4 The online literacy training strengthened my skills as a teacher.

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neither Agree nor Disagree
- ❍ Disagree
- ❍ Strongly Disagree

Q5 Using the CAR and CROWD strategies was easy to incorporate into shared reading.

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neither Agree nor Disagree
- ❍ Disagree
- ❍ Strongly Disagree

Q6 The CAR prompt and CROWD questioning prompt I learned in the online module were beneficial.

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neither Agree nor Disagree
- ❍ Disagree
- ❍ Strongly Disagree

Q7 The real-time, in-ear, coaching was distracting.

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neither Agree nor Disagree
- ❍ Disagree
- ❍ Strongly Disagree

Q9 The real-time, in-ear, coaching enhanced my ability to use the CAR prompt and CROWD questioning prompt.

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neither Agree nor Disagree
- ❍ Disagree
- ❍ Strongly Disagree

Q10 The training package (online module + *e*Coaching) was cost effective.

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neither Agree nor Disagree
- ❍ Disagree
- ❍ Strongly Disagree

Q11 I saw an increase in my students' listening comprehension because I participated in this research.

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neither Agree nor Disagree
- ❍ Disagree
- ❍ Strongly Disagree

Thank you for you participation in this survey. If you have any questions, contact Aftynne Cheek at aecheek@uncg.edu or 336-327-4135.

Qualtrics Survey Link

Coaching Social Validity Survey

This link will be emailed to all participants at the end of the maintenance phase.

Your Anonymous Survey Link:
https://uncg.qualtrics.com/SE/?SID=SV_5tj8Z7NLt4v5HYp
You can copy this link, then paste it into an email or website.

Note: This will not track identifying information. If needed, try our Survey Mailer

APPENDIX G

UNCG IRB

IRB Number: 15-0036	Initial	Principal Investigator: Aftynne Cheek

General Information

1. General Information

1.Project Title

Effects of Coaching During Shared Stories for Teachers of Students with SID

2.Brief Summary. Provide a brief non-technical description of the study, which will be used in IRB documentation as a description of the study. Typical summaries are 50-100 words. Please reply to each item below, retaining the subheading labels already in place, so that reviewers can readily identify the content. PLEASE NOTE: THIS SECTION MAY BE EDITED BY THE IRB FOR CLARITY OR LENGTH.

The researcher will examine the effects of coaching on teachers' use of the CAR and CROWD strategies and impact on student listening comprehension during shared stories for students with significant intellectual disabilities (SID).

3.Is this new study similar or related to an application already approved by a UNCG IRB? Knowing this will help the IRB in reviewing your new study.

No

4.Is there anything else you would like the IRB to know about this study?

No Answer Provided

2. Project Personnel

1.Will this be a STUDENT'S research (undergraduate, graduate) for the purposes of the fulfillment of requirements for a University course or program?

Yes

This study will require any student who is planning to lead the research project to assign themselves as the Role of Principal Investigator, however any student-led projects will require a Faculty Advisor and that advisor's oversight and sign-off on IRB applications. This should be the Faculty member who will mentor this research, who may or may not be your academic Faculty Advisor.

The Faculty Advisor will remain responsible for the conduct of the research and the storage of the data, as is the current UNCG policy.

The Faculty Advisor will be required to co-certify with the student PI. You should also make sure this person has a chance to review and edit the submission before you submit.

Please choose the type of research the student is proposing:

Dissertation

2.List all project personnel beginning with principal investigator, followed by faculty advisor, co-investigators, study coordinators, and anyone else who has contact with subjects or identifiable data from subjects.STUDENTS CANNOT BE CO-PI'S.

- List ONLY those personnel for whom this IRB will be responsible; do NOT include collaborators who will remain under the oversight of another IRB for this study.
- If this is Community Based Participatory Research (CBPR) or you are otherwise working with community partners (who are not functioning as researchers), you may not be required to list them here as project personnel; consult with your IRB.
- If your extended research team includes multiple individuals with limited roles, you may not be required to list them here as project personnel; consult with your IRB.

The table below will access campus directory information; if you do not find your name, your directory listing may need to be updated.

Last Name	First Name	Department Name	Role	Detail
Cheek	Aftynne		Principal Investigator	view

Rock	Marcia	Specialized Education Services	Faculty Advisor	view

3.Have all PI's and/or Student Investigators completed human subjects training through CITI or UNCG-ORI sessions? (only CITI Researcher or Student Researcher modules and/or UNCG training are accepted). The ORI office can verify CITI completion, however UNCG training or other training will need to be attached. (PLEASE NOTE: Research Assistants and non-investigators engaged in data collection need to have valid human subjects training on file with PI)

Yes

4.At any time, will members of the research team or their immediate family members have financial interest in, receive personal compensation from, or hold a position in an industry sponsoring this study or otherwise have a potential conflict of interest regarding the conduct of this study? If no, please state "no"

No

3. Funding Sources

1.Is this project funded (or proposed to be funded) by a contract or grant from an organization external to UNCG?

No

2.Is there Department of Health and Human Services (DHHS) grant application supporting this submission?

No

4. Screening Questions

The following questions will help you determine if your project will require IRB review and approval.

The first question is to determine whether this is RESEARCH

1.Does your project involve a systematic investigation, including research development, testing and evaluation, which is designed to develop or contribute to generalizable knowledge? PLEASE NOTE: You should only answer yes if your activity meets all the above.

Yes

The next questions will determine if there are HUMAN SUBJECTS

2.Will you be obtaining information about a living individual through direct intervention or interaction with that individual? This would include any contact with people using questionnaires/surveys, interviews, focus groups, observations, treatment interventions, etc. PLEASE NOTE: Merely obtaining information FROM an individual does not mean you should answer 'Yes,' unless the information is also ABOUT them.

Yes

The following questions will help build the remainder of your application.

3.Are any personnel, organizations, entities, facilities or locations in addition to UNCG engaged in this research (e.g., is this a multi-site study or does it otherwise involve locations outside UNCG, including foreign locations)? PLEASE NOTE: This does NOT include the sites you are recruiting from.

No

Exemptions

Request Exemption

Some research involving human subjects may be eligible for an exemption which would result in fewer application and review requirements. This would not apply in a study that involves greater than minimal risk, or involves

medical procedures or deception or minors, except in limited circumstances.

Additional guidance is available at ORI IRB . Exemptions can be confusing; if you have not completed this page before, please review this table with definitions and examples before you begin.

1.Would you like your application evaluated for a possible exemption?

No

Part A. Questions Common to All Studies

A.1. Background and Rationale

1.Provide a summary of the background and rationale for this study (i.e, why is the study needed?). Do NOT exceed one paragraph. Do NOT include a literature review. (If there is an accompanying DHHS grant application, please attach it to this application).

Teachers of students with significant intellectual disabilities (SID) require specialized knowledge to adapt and link the curriculum to grade level content to students (Hanline et al., 2012), and this knowledge is often learned in teacher preparation programs. As instruction transforms for students with SID transforms from functional to academic, literacy continues to be one content area requiring specialized knowledge. However, few teacher preparation programs provide a curriculum specializing in SID (Collins, 2007) and research provides little direction (Delano et al., 2010; Courtade & Ludlow, 2008).

A known fact is that teachers often struggle with transferring knowledge (e.g., literacy) into practice (Joyce & Showers, 1982). Also, there is a lack of research addressing how teacher preparation programs prepare teachers to provide literacy instruction to students with SID. Coaching, a practice that encourages the implementation and continued use of new teaching behaviors (Joyce & Showers, 1995), coupled with learning, may increase the likelihood that teachers will transfer new knowledge in to practice (Joyce & Showers, 2002). What is unknown are the effects of coaching on teachers' ability to transfer knowledge into practice or the effects on P-12 student outcomes.

Using the coaching continuum (Joyce & Showers, 1980), the researcher in this study will examine the effects of coaching on teachers' ability to implement literacy strategies during shared stories for students with SID. The literacy strategies include the CAR and CROWD strategies (Notari-Syverson et al., 1999). CAR stands for Comment and Wait, Ask questions and wait, and Respond by adding a little more. CROWD refers to a teacher led questioning technique that stands for Completion prompts, Recall, Open-ended, Wh- questions, and Distancing prompts. These teacher led strategies coupled together provide a way for teachers to help students comprehend text (Guzzetti et al., 2002), however research provides no indication that either strategy works for students with SID.

The following research questions will guide this study:

1. What is the effect of coaching on teachers' ability to implement CAR and CROWD strategies during shared stories for students with SID?

2. What is the effect of teachers' use of the CAR and CROWD strategies on listening comprehension for students with SID?

2.State the research question(s) (i.e., specific study aims and/or hypotheses).

The following research questions will guide this study:

1. What is the effect of coaching on teachers' ability to implement CAR and CROWD strategies during shared stories for students with SID?

2. What is the effect of teachers' use of the CAR and CROWD strategies on listening comprehension for students with SID?

A.2. Subjects

1. Total number of subjects to be studied by the UNCG investigator(s) (provide exact number):

50

2. Do you have specific plans to enroll subjects from these vulnerable or select populations:

✔ Children (under the age of majority for their location)
Note that you will be asked to provide age ranges for children in the Consent Process section.
✘ Non-English-speaking
✘ Decisionally impaired
✘ UNCG Students
✘ UNCG Employees
✘ People who are likely to be involved in abusive relationships, either as perpetrator or victim
✘ Prisoners, others involuntarily detained or incarcerated (this includes parolees held in treatment centers as a condition of their parole)
✘ Pregnant women
✘ Patients (i.e., have a specific disease, disorder or condition regardless of where they receive their healthcare)
✘ HIV positive individuals

3. If any of the above populations are checked, please describe your plans to provide additional protections for these subjects

Teacher participants: Kindergarten-8th teachers providing literacy instruction to students with significant intellectual disabilities.

Student participants: Kindergarten-8th students categorized as having a significant intellectual disability.

Note: Teacher participants will facilitate PI in determining students with SID. PI will verify students classification by viewing the portion of the students record indicating if (1) the student has a SID or SID and/or (2) follows an adapted curriculum.

Student participants, teacher participants, and parent participants will provide consent prior to their participation in the research study. Participants will be told that their participation in the study is voluntary and that they may withdraw at any time.

4. Age range of subjects:

Minimum age of subject enrolled	0

	years
Maximum age of subject enrolled	99
» If no maximum age limit, indicate 99	
	years

A.3. Inclusion/exclusion criteria

1.If there are any SPECIFIC required characteristics of potential subjects that may be a reason for their inclusion or exclusion, please list them. If not relevant, please state "n/a".

Teacher participants: Kindergarten-8th teachers providing literacy instruction to students with significant intellectual disabilities.

Student participants: Kindergarten-8th students categorized as having a significant intellectual disabilities.

Teachers who do not provided literacy instruction to students with significant intellectual disabilities and students who are not categorized as having a significant intellectual disability will be excluded from this study because the study targets a specific population of students and teachers.

2.Justify any exclusion based on race, gender or ethnicity. If not, please state "n/a".

n/a

A.4. Study design, methods and procedures

Your response to the next question will help determine what further questions you will be asked in the following sections.

1.Will you be using any methods or procedures commonly used in biomedical or clinical research (this would include but not be limited to drawing blood, performing lab tests or biological monitoring, or conducting physical exams)?

No

2.Describe the study design. List and describe study procedures, including a sequential description of what participants will be asked to do, when relevant.

Study and Design

Overall, the PI plans to conduct a quantitative research study using a single subject research design. A single subject research design is best suited for this study because it accounts for experiments involving populations with small Ns (e.g., students with significant intellectual disabilities) and enables the participant or participants to act as their own experimental control (Vannest, Davis, & Parker, 2013). Additionally, researchers can evaluate the effect of the intervention through visual displays (Gast, 2010).

Method

Setting. A public school will serve as the setting for this study. To make the training accessible, teachers will complete professional development online (e.g., Skype). Teachers will receive coaching in their classrooms during their regularly scheduled literacy lesson during school day.

Literacy instruction may occur in a one-on-one setting or during a small group lesson. Since the instruction may include students who are not consenting, student participants, parents of

non-consenting students will fill out a video-recording permission form. Students' whose parents do not give permission for video-recording will be place out of the view of the camera during the study. The teacher participant will use the CAR and CROWD strategies during literacy lessons. If the study occurs in a group setting, the teacher participant will used these strategies with all students in the classroom. If the study occurs in a one-on-one setting, the teacher will use the strategies with only the consenting student participant. Data will only be collected on the consenting student participant with SID.

Students with SID typically receive instruction in small groups with peers who have similar ability levels or in a one-on-one setting. Although unlikely, the PI and teacher will ensure the student with SID will not be singled out in front of other students by using this strategy with the entire class (if in a group setting) or conducting the lessons during typical literacy or pull-out settings (if in a one-on-one setting)

Participants. Teacher participants in this study will be kindergarten-8th grade teachers of students with SID. All teacher participants will be over the age of 18 and the estimated number of teacher participants in this study is 5-7. Student participants will be kindergarten-8th grade students with SID receiving literacy instruction. The estimated number of student participants for this study is 20-30. Both teacher and student participants will be informed their rights as research participants, provide written consent, and be notified that their participants in the study is voluntary. Parents of student participants will be informed rights and must consent to their student participant partaking in the study.

Independent Variable

As stated previously, teachers experience difficulty transferring knowledge into practice (Joyce & Showers, 1982). Coaching coupled with learning increases the likelihood that teachers will transfer knowledge into practice (i.e., 0.0 effect size; Joyce & Showers, 2002). Therefore, the independent variable in this study will be training plus coaching. The training content will occur online and will include information such as the importance of literacy for students with SID, shared stories, CAR/CROWD strategies (Whitehurst, 1992), systematic instruction. The PI will provide in situ, in ear coaching via bug-in-ear (BIE) technology. Coaching will be instructing, encouraging, or questioning (Rock et al., 2009). The training will take no more than 1 hour.

Dependent Variable

Teacher variable includes teachers ability to use the CAR and CROWD strategies during shared reading for students with SID. PI will measure the frequency higher order vs. lower order questions the teacher uses when implementing the CAR and CROWD Strategies.

Student variable will be the number of correct, unprompted answers to teachers questions when asking questions with the CROWD strategy and following the CAR strategy.

Procedures

1. Baseline: PI will observe teacher participants teaching a typical literacy lesson. No coaching will be provided. Data will be collected on (1) the type of higher order vs. lower order questions the teacher asks uses when implementing the CAR and CROWD strategies and (2) the number of correct, unprompted student responses. Lessons will be video recorded. Baseline will include 5 data points and will be staggered across participants. Teacher participants will remain in baseline phase until data are stable.

2. Intervention: (Training + coaching) Prior to teaching, teacher participants will complete an online training. The training will occur online and will include information on the importance of literacy for students with SID, shared stories, CAR/CROWD strategies, systematic instruction. The training will take no more than 1 hour. After completing the training, teacher participants will teach a literacy lesson and at this time the PI will provide in situ, in ear coaching via bug-in-ear (BIE) technology. Coaching will be instructing, encouraging, or questioning (Rock et al., 2009).

Once teacher participant 1 meet performance criteria, teacher participant 2 will enter the study. Performance criteria equals a greater number of higher order questions vs. lower order questions for 2 consecutive sessions. Teacher participants will complete the online training.

3. Teacher participant 1 will teach their literacy lesson incorporating strategies learned during the online training. Student participants will participate in the literacy lesson. Lessons will be video recorded. Data will be collected on teacher participant behavior and student participant behavior. Once teacher participant 1 meets performance criteria, teacher 2 will enter intervention. This will continue until all teacher participants have entered the intervention.

4. **Maintenance.** Once all teacher participants have moved in to the intervention, they will begin the maintenance phase. Similar to baseline, teacher participants will teach regularly scheduled lessons, but no coaching will be provided during the maintenance phase. Lessons will be video recorded and uploaded to a secure and private database. Data will be collected on teacher participants' behavior and student participants behavior.

Measures and Data Collection. (all are provided as an attachement)

Dependent Variable. Coaching fidelity checklist.

Independent Variables:

- Teacher Participant: Frequency higher order vs. lower order questions the teacher uses when implementing the CAR and CROWD Strategies.

- Student Participant: The number of correct, unprompted answers to higher and lower order questions asked by teachers when using the CROWD strategy and following the CAR strategy.

Social Validity Measure. Unique to single-subject designs, participants will also complete a measure *social validity* measure. Social validity refers to the degree to which others (i.e., teacher participants) think the targeted changes in behavior were important and if the methods used to encourage these behaviors were acceptable and helpful (Richards et al., 1999; Horner et al., 2005). Using a measure of social validity adapted from Browder et al. (2007) and aligned with Horner et al., the PI will collect data on goals, procedures and effects of the intervention/ training package (Gast, 2010).

At the completion of the study, teacher participants will complete a 10 question, 5-point Likert-type scale questionnaire indicating their level of satisfaction with the intervention (i.e., training package). Scores on the Likert scale will range from 1 to 5 with the numbers representing the following: *1 = strongly disagree*, *2 = disagree*, *3 = neither disagree or agree*, *4=agree, 5=strongly agree*. The social validity questionnaire will occur online through Qualtrics The mean and range will be collected for the survey. ***A copy of the measure of social validity is provided as an attachment.***

Fidelity Measures

Interrater Reliability/Interobserver Agreement (IOA): Measurement errors refer to differences between real values and observed values (Vannest et al., 2013) and occur in all applied research settings (Hoffman, 2005). Interobserver reliability (or IOA) will be collected to assess measurement errors for both for the teacher fidelity and student performance. The PI and a trained secondary observer will collect IOA. Additionally, the trained secondary observer will complete a confidentiality form. *A copy of the secondary observer confidentiality form is provided as an attachment.*

Note: In order to minimize distractions in the classroom, interobserver reliability will be completed through the use of the secure videotaped recordings of the probe sessions. Reliability will be calculated by dividing the number of agreements between the observers by the total number (agreements + disagreements) and multiplying by 100 (Vannest et al., 2013).