TEACHING STUDENTS WITH SEVERE AND MULTIPLE DISABILITIES:

THE IMPLEMENTATION OF SHARED STORIES

by

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A DISSERTATION

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ABSTRACT

This study investigated the results of employing shared story reading during literacy instruction for participants with severe and multiple disabilities. This intervention was conducted in an effort to improve independent responses made by participants with severe and multiple disabilities within a small group on a task analysis during shared stories. The participants of the study were elementary students receiving special education services who were enrolled in two schools within the local educational agency (LEA).

The researcher employed a task analysis to identify correct response patterns from participants. The researcher and other professionals implementing related services employed Universal Design for Learning (UDL) techniques in an effort to augment independent correct responses within small group instruction. The UDL techniques incorporated augmentative and alternative communication (AAC) devices and intraverbal training techniques in an effort to promote independence and participation. The researcher provided intraverbal training by presenting various styles of questions during literacy training, and the participants used AAC devices, picture symbols, communication boards, and objects relating to the story to appropriately respond to specific questions from the task analysis.

The task analysis measured the students' intraverbal skills, comprehension, and participation. Only the independent responses were incorporated for inclusion into this study; however, general reactions and nonresponsiveness were recorded to facilitate improved participant engagement through UDL planning. This task analysis was employed for each participant during the baseline, intervention, generalization, and maintenance phases of the

study. Professionals who attended the team planning meetings completed a checklist to ensure that all components of UDL were addressed for each step of the task analysis.

The results of the current study indicated that the number of independent correct responses increased for all participants across all phases of the study. The study indicated that the participants engaged during shared story reading by attending to objects, using AAC devices to interact during the story and demonstrate comprehension of text. Taken together with the Browder, Mims, et al. (2008) study, the results of the study suggested that the implementation of UDL components with shared story reading is an effective method to promote literacy learning for students with severe and multiple disabilities.

DEDICATION

I dedicate this entire dissertation to the ones I love:

God,

my family,

my friends,

all of my wonderful students,

especially, my first all-time favorite student, Brooke Davis

(may he rest in peace or should I say keep God really busy),

and Jamie Lee (a very special student and daughter).

Have a happy day!!

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Peace be with you. Roll Tide. And better yet Thank God!!!

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CHAPTER 1

INTRODUCTION

Research has indicated that literacy instruction is an essential element in the development of academic skills as well as facilitating interpersonal relationships within the community Browder, Gibbs, et al., 2009; Koppenhaver & Erickson, 2003). However, educators have been reluctant to use limited resources in an effort to target literacy instruction for individuals with significant cognitive deficits (i.e., IQ below 55) secondary to the preconceived notion that this population would provide little to no return from this investment (Browder, Gibbs, et al.). Specific research based instruction is needed in regards to students with significant cognitive disabilities to yield maximum outcome during literacy instruction (Browder, Ahlgrim-Delzell, et al., 2008).

In recent years, education has realigned in order to remain compliant with both the *Individual with Disabilities Education Act of 2004* (IDEA, 2004) and *No Child Left Behind Act of 2001* (NCLB, 2001). Teaching students with significant cognitive disabilities also has refocused to align with the general education curriculum. Schools must provide an education toward the general education curriculum and afford means to ensure gains in the curriculum as well as augment participation in academic assessments for all students receiving special education and related services (Baker, Spooner, Ahlgrim-Delzell, Flowers, & Browder, 2010; Hitchcock, Meyer, Rose, & Jackson, 2002; IDEA; NCLB). This is accomplished via an Individualized Education Program (IEP), which is a document that specifies the academic goals and methods utilized to obtain the goals through special education and related services and

supplemental aids and services, which are based on peer reviewed research when possible (Browder, Wakeman, & Flowers, 2006; Clayton, Burdge, Denham, Kleinert, & Kearns, 2006; Gartin & Murdick, 2005; IDEA; Parette & Murdick, 1998). Many researchers have voiced the need for additional empirical-, evidence-, or research-based approaches (Browder, Wakeman, & Flowers, 2006; NCLB, 2001; Sturm & Clendon, 2004) to literacy instruction in order to confront these challenges for students with severe intellectual disabilities (Browder & Cooper-Duffy, 2003; Browder, Wakeman, et al., 2007; Hanser & Erickson, 2007; Justice & Kaderavek, 2004; Knight, Browder, Agnello, & Lee, 2010). In order for students with severe and multiple disabilities to participate in the general curriculum, researchers have argued that assistive technology (AT) should be considered (Clark, 2000; Clayton, Burdge, Denham, Kleinert, & Kearns, 2006). Snell, Chen, and Hoover (2006) indicated that augmentative and alternative communication (AAC) devices and techniques are beneficial parts of AT. The IDEA Section 1400 mandated that the need for AT be considered and must be documented in the IEP. These techniques can assist students in participating in the general education curriculum as set forth by NCLB and IDEA. Success in academic content areas (e.g., reading) can contribute to a meaningful and productive way of life (Browder, Gibbs, et al., 2009; Browder, Spooner, Wakeman, Trela, & Baker, 2006).

Reading has the capacity to augment the quality of life for an individual from enjoyment of interaction to obtaining knowledge pertaining to community events (Hetzroni, 2004; Rao, 2009). Research has indicated that shared story book reading is an effective method to promote communication skills and the development of literacy skills for individuals with disabilities (Al Otaiba, 2004; Mims, Browder, Baker, Lee, & Spooner, 2001). Shared story reading employs storybooks as a framework for presenting instructional strategies to facilitate communication,

language acquisition, and literacy skills (Bellon & Ogletree, 2000). It also creates a language rich environment that is interactive in nature, which has the capacity to target acquisition of literacy and language skills for students with intellectual disabilities (Liboiron & Soto, 2006).

Students with severe intellectual disabilities have limited opportunities for instruction in academic content areas (e.g., reading; Browder et al., 2007). In addition, few researched based models for teaching academic content standards are available (Browder, Flowers, & Wakeman, 2008). This study will add to the limited research relating to the promotion of literacy skills for students with severe and multiple disabilities. This study is an extension of the Browder, Mims, Spooner, Ahlgrim-Delzell, and Lee (2008) study, which indicated that the employment of Universal Design for Learning (UDL) components during shared story reading involving students with severe and multiple disabilities promotes learning. This is one of a few studies involving students with severe and multiple disabilities in learning targeted literacy skills (e.g., extended standards; Appendix A). Modifications to the previous study are consistent with the authors' recommendation of expanding the research to include the efficacy of the previous interventions via a small group format, generalizing to novel materials, and maintaining learned skills over time (Browder, Mims, et al., 2008; P. Mims, personal communication, January 6, 2010). Research has indicated that the procedure of shared story reading is beginning to promote literacy interaction and comprehension for students with severe and multiple disabilities (Browder, Mims, et al.). Students with severe and multiple disabilities are beginning to receive meaningful instruction in literacy through the use of shared story reading (Browder, Gibbs, et al., 2009). However, additional research is needed in regard to shared story reading in order to validate the strategy as an evidence-based practice for students with severe disabilities.

Shared story reading has the potential to encourage communication and interaction among individuals with multiple disabilities (Browder, Mims, et al., 2008; Koppenhaver, Erickson, & Skotko, 2001). Opportunities to promote communication interaction for students with severe and multiple disabilities can occur from social interactions (Calculator & Luchko, 1983). Shared story reading can be a reoccurring activity at home and school that provides practice, which can lead to self-confidence for students with severe and multiple disabilities to participate in activities (Bellon-Harn & Harn, 2008; Skotko, Koppenhaver, & Erickson, 2004) with peers or family in a typical environment. One obtainable goal of this study was to train students with severe and multiple disabilities to respond in a manner that is easily understood by members of the general community who have had limited or no experience interacting with individuals with severe disabilities (Durand, 1999), as well as individuals in the school environment and/or other peer-related situations. When individuals are able to respond in a meaningful manner to the communication attempts of others, the interaction can be socially rewarding (Goldsmith, LeBlanc, & Sautter, 2007). Students who have access to AAC are provided a conduit to convey previously obtained knowledge as well as the ability to express basic needs. Participation in literacy instruction enables students with severe and multiple disabilities to gain self-confidence, gain knowledge, and show awareness of tasks (Browder, Ahlgrim-Delzell, et al., 2008). Literacy instruction augments the quality of life, enhances social interactions, improves the communication skills within a functional context (Kaderavek & Rabidoux, 2004), and targets the skill of obtaining meaning from the text (Browder, Gibbs, et al., 2009).

Collaboration (e.g., team planning meetings) to discuss UDL components and techniques will help meet the challenge of incorporating AAC into the classroom to encourage student

engagement and success (Castellani & Jeffs, 2001) in academic content areas. The education of students with severe and multiple disabilities, whether in the inclusive setting or with the general education curriculum, involves planning and collaborating, to be successful (Cooper-Duffy, Szedia, & Hyer, 2010; Cushing, Clark, Carter, & Kennedy, 2005; Downing & Eichinger, 2003; Soto, Muller, Hunt, & Goetz, 2001). The NCLB Act requires the participation of students with significant cognitive disabilities in academic content areas (e.g., reading or literacy). The straightforward definition of literacy is the skill to use words (Durando, 2008). Participating in literacy instruction is an area that can be easier to accommodate than other academic content areas. There are so many activities that can be incorporated with AAC devices and techniques. To elaborate, literacy involves writing , reading, and incorporates the use of AAC devices to communicate and adhere to a daily schedule, which is represented with picture symbols, objects, and pictures that present the activities of the day (Durando).

Statement of the Problem

A primary concern of special educators is a lack of appropriate instruction with the general education curriculum for students with severe and multiple disabilities (Baker et al., 2010; Browder, Gibbs, et al., 2009). Educators have a need to practice effective participation and learning strategies that are evidence-based and proven effective for this population (Browder, Wakeman, & Flowers, 2006). The focus of this research was to facilitate the ability of participants with severe and multiple disabilities to participate in literacy instruction in a meaningful manner. This task was accomplished via the implementation of UDL components with a task analysis of shared story reading, which provided the instruction, practice, and devices to allow optimal interaction on the part of the student. This study investigated the use of a 16-

step task analysis for shared story reading in conjunction with UDL components as an intervention to engage students with severe and multiple disabilities in the general education content area of literacy. The current research expands the literature by involving students with severe and multiple disabilities the opportunity to actively participate within a small group format.

The IDEA (2004) and NCLB (2001) endorsed improvement in reading as well as the other academic content areas for students, including students with significant cognitive deficits. Research has indicated that shared story reading promotes literacy interaction and comprehension (Browder, Mims, et al., 2008; Erickson, Koppenhaver, et al., 2001). If students with severe and multiple disabilities do not exhibit skills or behaviors appropriate for interacting with the literacy lesson, then intervention is essential. The majority of students with severe and multiple disabilities are unable to develop literacy skills without explicit instruction. Research-based interventions that have been proven effective are required to develop skills needed to participate in literacy instruction (Browder, Mims, et al.).

Purpose of the Study

The purpose of this study was to investigate the utilization of UDL components to increase participation and learning within general education curriculum in literacy instruction using a task analysis for shared story reading (Appendix A) for students with severe and multiple disabilities. The researcher incorporated Universal Design for Learning (UDL) strategies (CAST, 2010), which included intraverbal training (Skinner, 1957) and AAC (Light, 1997), limited to picture symbols, objects relating to the story, and voice output devices (e.g., Dynavox, CheapTalk, BigMac), as a technique for increasing interaction of students with severe and

multiple disabilities within the classroom environment during literacy instruction. Universal Design for Learning is a template of instructional practice that can be employed for students with and without a disability (King-Sears, 2009). Research has indicated that UDL facilitates participation in the general education curriculum (e. g., science, literacy), which incorporates intraverbal skills and AAC usage (Light, 1997; Soto, Muller, Hunt, & Goetz, 2001; Spooner, Baker, Harris, Ahlgrim-Delzell, & Browder, 2007) for all individuals within the classroom (i.e., with or without a disability; King-Sears, 2009).

Employing UDL is a straightforward intervention in that the requisites steps are (a) plan for the ability range of all students who are in a particular classroom; (b) choose curricula; (c) choose resources; (d) choose approaches; and (e) select supportive, stimulating settings for all the students (CAST, 2010; Pisha & Coyne, 2001). This planning from the beginning is beneficial to all students who require supports to learn. Browder, Spooner, et al. (2006) stated that research is needed to support effective practices for students with severe and multiple disabilities to be successful in the general education curriculum in areas such as reading and literacy. Using shared story reading could provide additional evidence (Browder, Mims, et al., 2008) for literacy instruction. This study, an extension of Browder, Mims, et al.'s (2008) research on individual students, investigated whether students with severe and multiple disabilities have the capacity to demonstrate similar results while receiving literacy instruction in a small group format, with novel materials, and maintain skills over time.

Browder, Gibbs, et al. (2009) have described reading to students and active engagement by a variety of terms (e.g., shared reading, read alouds, book sharing, and shared stories). Reading books on a regular basis provides the student with a routine where language and/or picture symbols are modeled on a predictable basis (Dickerson, 1999; Snow & Goldfield, 1983).

Picture symbols have become an essential and engaging element of literacy instruction, due in part to the easy access and progress of student learning (Parette, Boeckmann, & Hourcade, 2008; Sheehy, 2002). Shared story reading has the capacity to provide a supportive environment that facilitates learning, opportunities for interaction, and models to imitate for students with severe and multiple disabilities (Kliewer, 2008). That is, it provides a predictable routine, which can quickly become familiar to the student, subsequently augmenting the production of novel language development (Snow & Goldfield; Stephenson, 2009). In many instances, students are aware of expectations within the classroom environment and the requisite responses desired by the classroom teacher. This awareness should facilitate more natural or comfortable participation due to decreasing stress associated with classroom performance. Students with severe and multiple disabilities, who do not learn to read, will still gain some benefits if purposeful instruction is provided (Browder, Gibb, et al.).

This task analysis sought to obtain documentation of the participants' independent correct responses during shared story reading when interacting with AAC, limited to picture symbols, objects relating to the stories, and voice output devices (e.g., Dynavox, CheapTalk, BigMac) and scaffolding skills (e.g., modeling, cueing) during literacy participation. In order to effectively enable communication interactions between the students with severe and multiple disabilities and the teacher, both participants need to possess adequate opportunities for intraverbal communication. Teachers must use techniques (e.g., UDL, AAC, scaffolding skills) to facilitate participation in activities including literacy instruction (Spooner et al., 2007). This allows students to participate by demonstrating their knowledge and understanding. While specific data pertaining to intraverbals and AAC were not reported, verbal responses by participants were discussed. Additional evidence-based practices are necessary to ensure the success of students

with intellectual disabilities, especially students with severe and multiple disabilities, when using AAC with the general education curriculum (Browder & Cooper-Duffy, 2003; Browder, Wakeman, & Flowers, 2006) through the implementation of UDL techniques.

The *Technology Related Assistance for Individuals with Disabilities Act of 1988* (Tech Act) required states to catalog available assistive technology services and verify that individuals with disabilities are allowed to utilize the assistive technology services including assessment, funding for devices, training, and technical assistance. The Tech Act provided the definition for assistive technology (AT), which appeared in subsequent laws (Crowl & Franklin, 1994). The definition of assistive technology is "any item, piece of equipment, or product that is used to increase, maintain, or improve the abilities of individuals with disabilities" (Tech Act, 1988 29 U. S. C. '2202(2) pg 8164). *Individuals with Disabilities Education Act of 1990* developed the terminology "assistive technology" and added AT as a related service in the IEP. *Individuals with Disabilities Education Act of 1997* (IDEA, 1997) mandated that IEP teams need to consider AT and AT services for all individuals who are receiving special education services and related services.

The *Individuals with Disabilities Education Act of 2004* (IDEA, 2004) mandated that the IEP team consider AT and related services for all individuals receiving special education services. The IDEA (2004) mandated that this process is documented in the IEP. The service delivery is services that directly assist an individual with the selection, acquisition, or use of an assistive technology device (IDEA, 2004). The service delivery involves evaluation, coordination, acquisition, selection, training the user, and training the professionals (Bausch & Hasselbring, 2004; IDEA).

During the 1950s and 1960s, AAC was available to individuals with significant disabilities who were unable to use speech as a method to communicate (Hourcade, Pilotte, West, & Parette, 2004). In the 1970s, AAC matured into an entity as a field to be recognized (Alant & Lloyd, 2006). In the 1970s and 1980s, the *Education for All Handicapped Children Act of 1975* (P. L. 94-142) mandated that all school aged children with disabilities would receive a free and appropriate public education as well as related services in their least restrictive environment. The 1980s experienced legislative mandates that directly affected technology for students with disabilities; the *Technology-Related Assistance for Individuals with Disabilities Act of 1988* (P.L. 100-407) ensured that states were assisting individuals of all ages with disabilities to acquire AT. Technology should be available to enhance the lives of individuals with disabilities in communication and daily living. With the passage of these laws, AAC was considered a vital part of AT (Snell, Chen, & Hoover, 2005).

This is a time when voice output devices and computer programs became popular for students with autism and other developmental disabilities (Ogletree & Harn, 2001). Augmentative and alternative communication (AAC) devices and techniques are often considered for children with severe intellectual disabilities and severe speech disorders during the planning of the IEP. The IEP team evaluates the student's needs in order to decide what assistive technology and services are necessary to ensure that the student makes progress toward goals (Parette & McMahan, 2002), and AAC is a beneficial component of reaching goals. In order to remain in compliance with IDEA (2004), schools must provide documentation to prove that AT was considered for all students receiving special education services (Snell, Chen, & Hoover, 2005).

The Tech Act of 1988 promoted the use of assistive technology, which includes AAC (Hourcade, Pilotte, West, & Parette, 2004). Although the implementation of AAC techniques and devices have been present in the classrooms for students with Autism and complex communication disorders since the early 1980s (Matas, Mathy-Likko, Beukelman, & Legresley, 1985), AAC emerged in the late 1980s as vital to facilitate the participation in the educational development for students with severe and multiple disabilities (Romski & Sevcik, 1988). Calculator and Dollaghan (1982) reported that classroom teachers attended to student responses more often than to student-initiated communication. The results of a study by Carter (2003) indicated that communication interactions using AAC when present in the natural environment or routines of the classroom are more beneficial as compared to simulated training instructions (Hunt & Alwell, 1991) for students who use AAC. These students need active and attentive listeners who will respond to appropriate interaction. Skinner (1957) interpreted the listener as a member of the audience, which means that the listener is an important and vital piece of the discriminative stimulus providing reinforcement. Listeners need training to respond appropriately and understand the student using AAC (Light, Battilo, English, Gutierre, & Hartz, 1992). Research has indicated that the response time needed for a student who uses AAC to communicate is an issue associated with the quality of the interaction due to the respondent's delayed reaction being uncomfortable to the listener (Carter & Maxwell, 1998; Light et al.; Myers, 2007; Todman, 2000). This reinforces the idea that students need practice and modeling as an instructional technique, factors that can be considered in UDL. Students who use AAC need to have worthwhile or significant opportunities to participate in planned instruction (Light, 1997). Therefore, their participation should be consistent with the lesson at the appropriate time and level.

Significance of the Problem

Greenspan (2006) stated that individuals with intellectual disabilities are vulnerable to being deceived and manipulated by others. These students often are perceived as gullible and in many instances stand out in class due to a lack of appropriate participation in instruction. This lack of typically developing behavior is a characteristic of intellectual disabilities. According to the definition accepted by NCLB (2001) and IDEA (2004), deficits in adaptive behavior are a characteristic of individuals with intellectual disabilities. Communication and social behaviors are descriptors used to portray the lack of capabilities of individuals with intellectual disabilities. According to the Alabama State Department of Education (ALSDE), the term multiple disabilities is reserved for a student who meets the eligibility criteria for two or more impairments (e.g., mental retardation and other health impairment) such that the combination and severity of these disabilities is to the extent that the student cannot be accommodated in a special education program based exclusively on one of the impairments (Morton, 2009). The American Association of Intellectual and Developmental Disabilities (2009) stated in their definition, adaptive behaviors relate to conceptual social and practical adaptive skills. According to Brooks and Baumeister (1983), deficits in adaptive functioning, not subaverage intellectual ability, are the most common presenting symptoms for individuals with intellectual disabilities (Haygood, Meyers, & Switzky, 1982).

Adaptive functioning is the degree to which an individual has the capacity to effectively cope with the typical demands associated with independent living when compared to individuals of similar age, cultural background, and socioeconomic status as well as mutual interactions (American Psychiatric Association [APA], 2000; Harrison & Oakland, 2003). Adaptive functioning includes communications skills, community skills, and academic skills (Bryant &

Maxwell, 1999). Adaptive behaviors can be affected by factors such as education, personality, and socioeconomic status (APA). Students with severe and multiple disabilities require training and practice to demonstrate appropriate instructional behavior while having access to the necessary technology to facilitate learning.

Instruction in literacy can facilitate skills that enhance the quality of life for students with severe and multiple disabilities by providing skills for communication, acquiring information, and the pleasures of reading (Browder, Gibbs, et al., 2009; Hetzroni, 2004; Rao, 2009). Students with severe and multiple disabilities should be afforded the opportunity to effectively communicate their desires, basic needs, knowledge, and aspirations; therefore, a mode of communication to satisfy these criteria should be provided and implemented on a regular schedule (Wright, 2008). Individuals with severe and multiple disabilities have limitations in the area of communication and motor abilities as well, thus, the need to investigate avenues to facilitate interactions involving motor or verbal skills (Cosbey & Johnson, 2006). Sensory and mental deficits are additional limitations that face students with severe and multiple disabilities and have an adverse effect on obtaining literacy skills (Hetzroni; Kliewer, 2008).

Research has indicated that individuals with intellectual disabilities and other developmental disabilities have used AAC devices and techniques effectively to communicate with significant others (Bellon-Harn & Harn, 2008; Schepis & Reid, 2003; Skotko et al., 2004) and gained access to literacy instruction (Hetzroni). Positive results with operant interventions (e.g., the Lovaas method, Applied Behavior Analysis) and the acquisition of verbal behavior have been related in several studies (Braam & Poling, 1983; Carr & Firth, 2005; Miguel, Carr, & Michael, 2002). Skinner (1957) developed verbal behavior for the purpose of training communication skills for children with developmental delays. Verbal behavior facilitates

participation in academic instruction and communication. With planning and cooperation, curriculum designed using UDL initially includes students with disabilities in an effort to create an environment that encompasses all students (Meyer & Rose, 2000).

In an environment implementing UDL, students with disabilities have their needs and strengths considered during the planning stage as opposed to after they fail (Micheal & Trezek, 2006). Special educators and other professionals (e.g., general educators, administrators, librarians, Speech and Language Pathologist [SLP]) must become partners in creating the UDL environment, which will allow all students the opportunity to gain knowledge from the general education curriculum (Browder, Spooner, et al., 2006; Dukes & Lamar-Dukes, 2009). The same teachers will access the alternative extended standards from the students' IEPs then adapt the planning of lessons to ensure quality learning for students with severe and multiple disabilities (Browder, Spooner, et al., 2006; Clark, 2000; Cushing, Clark, Carter, & Kennedy, 2005; Dukes & Lamar-Dukes). Conceivably the broad challenge that faces all teachers is that of determining how to balance the development of goals and objectives on the IEP for students with the need to concurrently concentrate on state standards (Dymond & Orelove, 2001) that ultimately relate to state assessments.

The teacher is responsible for the appropriate instruction, which requires modification of content, procedures, and educational delivery of the general education curriculum in a manner that enables the students' with intellectual disabilities to increase their potential to learn in large or small groups and individually in a variety of settings (Clark, 2000). Wehmeyer (2006) stated that supplemental aids and services make it possible for students with intellectual disabilities to progress and participate in the general education curriculum. Supplemental aids and services allow students with intellectual disabilities to be educated to the fullest possible extent (IDEA,

2004; Sec. 602, 20 U. S. C. 1401, 33). Universal Design for Learning is a strategy that encompasses these services and aids to allow students with severe and multiple disabilities to access the learning environment as the lesson is being presented.

According to Carter (2003), students with severe and multiple disabilities have demonstrated a lack of spontaneity or reactivity; therefore, these students typically require cues to elicit desired responses when using AAC (e.g., stating first part of repeated storyline). Teacher and student training in intraverbal behavior have the potential to benefit students who lack spontaneity and reactivity (Frost & Bondy, 2006; Ingvarsson, Tiger, Hanley, & Stephenson, 2007). Daily activities create a routine and provide practice for the student with severe and multiple disabilities to communicate and interact (Stiebel, 1999). Shared story reading can be considered part of a routine because the activity can be a common and repeated interaction at home and/or at school (Liboiron & Soto, 2006; Rosa-Luga & Kent-Walsh, 2008; Skotko et al., 2004). Shared story reading is predictable in form of response (i.e., pauses) and text (i.e., repeated storylines). This predictability allows the student with severe and multiple disabilities to anticipate events and affords them an opportunity to more effectively communicate information pertaining to the activity (Bruce & Vargas, 2007). This facilitates successful participation in instruction and appropriate demonstration of knowledge on the part of the student.

This methodology is similar to the strategies employed by very young children to communicate with significant others before they acquire basic language skills. Specifically, young children and those with severe and multiple disabilities employ similar strategies to communicate basic needs such as pointing, reaching, or speaking (Meadan, Halle, Ostrosky, & DeStefano, 2008). The primary reasons very young children use language are to express basic wants and needs, to obtain knowledge about the environment around them, to gain and maintain

social interaction, and to share information with other individuals in their environment (Romski & Sevcik, 2005).

Students with severe and multiple disabilities have similar desires to communicate as young children; however, secondary to their disability they may seek out different avenues to achieve this task. Sundberg and Partington (1998) used Skinner's (1957) verbal behavior theory of concentrating on the mand training and intraverbal training to assist individuals with severe and multiple disabilities in obtaining similar objectives as their age appropriate peers as well as facilitate successful communication within the context of their environment. Mands are considered requests or commands elicited from the speaker (Sundberg & Partington, 1998). Intraverbals are responses to questions and statements that are unique in that the phrases or words are not part of wording (Sundberg & Partington). Shared story reading incorporates intraverbal questions, necessary practice, and successful participation for students with severe and multiple disabilities. Shared story reading is a viable method to encourage literacy growth for all students, especially students with disabilities (Justice & Kaderavek, 2002).

Research has indicated extensive interaction occurs between communication partners when students with severe and multiple disabilities employ communication boards as compared to other modes for initiating communication (Calculator & Dolloghan, 1982). Communication boards (i.e., grids with picture symbols relating to task or subject; Peake, 2003a) can be utilized by communication partners (e.g., teachers, parents, peers) to allow the student more control of interactions. Communication partners can use shared story reading paired with a communication board when necessary as an opportunity to introduce literacy skills as well as choice making, answering questions, and labeling (Justice & Kaderavek, 2002), all of which are elements of Skinner's (1957) definition of verbal behavior. Employing AAC techniques and devices can

enable a student with severe and multiple disabilities opportunities to participate and gain knowledge from shared story reading (Skau & Cascella, 2006). However, just like age appropriate peers, some students with intellectual disabilities will elect not to participate or communicate a dislike of the current classroom assignment.

In Skinner's (1957) approach to verbal behavior, the person acting as the listener provides reinforcement for the verbal behavior (DeRose, 1996). Students must have access to an appropriate mode of communication to be a participant, which is considered when implementing UDL strategies. Myers (2007) has indicated that when adults used continuous modeling of AAC devices there was an awareness of the need to change vocabulary due to inadequate picture symbol choices (Browder, Gibbs, et al., 2009; Sturm & Clendon, 2004), which disallows the student with severe and multiple disabilities to participate using the device effectively. The teacher's job is to be the creator and set-up team of appropriate symbols and devices for each activity.

Skinner (1957) focused on the behavior of the speaker (Michael & Sundberg, 2001) in the context of individuals within the environment have to be trained to respond correctly to student interactions. In other words, Skinner focused on the speaker's verbal behavior more so than that of the environment when training language behavior (Rose, 1996; Skinner, 1957; Michael & Sundberg, 2001). Language behavior is an integral part of the plan using UDL, which can be addressed by the teachers and peers. The environment has to be manipulated or conducive to learning in order for the student to be the speaker. A responsive audience is beneficial for students with severe and multiple disabilities for interactions and feedback (Blyden, 1988; Skinner, 1957).The teacher has the responsibility to develop lessons that encourage spontaneity in students with severe and multiple disabilities (Frost & Bondy, 2006). The teacher sets the

stage or scene for all students to manipulate the environment when presenting literacy instruction. The arrangement of the environment and manipulatives allows opportunities for students to interact (Meadan, Halle, Ostrosky, & DeStefano, 2008). For the purposes of this study, the researcher was limited to intraverbal training in response to probes addressed to, or trained with, the student during literacy instruction using the task analysis.

Research Questions

The purpose of this study was to determine whether the implementation of UDL via task analysis of shared story reading will increase response skills (e.g., predicting, choosing) through participation in literacy instruction with intraverbals and AAC. The following research questions were answered:

1. What are the effects of the components of UDL on the number of independent correct responses for students in small group instruction to progress through a shared story as measured by the task analysis? (P. Mims, personal communication, January 6, 2010).

2. To what extent does the team planning process to individualize instruction generalize to shared story reading with a different book as measured by the task analysis? (P. Mims, personal communication, January 6, 2010).

3. What are the effects of the components of UDL on students' ability to maintain skills demonstrated by independent correct responses during small group instruction to progress through a shared story as measured by the task analysis? (P. Mims, personal communication, January 6, 2010).

Definition of Terms

Adaptive behavior (adaptive functioning). Adaptive behaviors are the degree to which an individual has the capacity to effectively cope with the typical demands associated with independent living when compared to individuals of similar age, cultural background, and socioeconomic status as well as mutual interactions (American Psychiatric Association, 2000).

Alternative standards (alternative achievement standards, extended standards, and modified academic achievement standards). Standards that align with each state's academic content standards for general education, which match the standard while having a continuum of possible achievement levels at each grade level and content subject for students who participate in alternative assessments (Browder, Wakeman, et al., 2007; Eckhout, Plake, Smith, & Larsen, 2007; Roach, Beddow, Kurz, Kettler, & Elliot, 2010; Towles-Reeves, Kleinert, & Muhomba, 2009; U. S. Department of Education, 2007). Alternative standards are geared toward access to the general education curriculum, the basis for alternative assessment for students who cannot participate in the state assessment, and should list the reason and the measures used to determine the level of success (Towles-Reeves et al.; Wakeman, Browder, Meier, & McColl, 2007).

Assistive Technology. "Any item, piece of equipment, or product that is used to increase, maintain, or improve the abilities of an individual with disabilities" is considered assistive technology (Tech Act, 1988 29 U. S. C. '2202(2) pg 8164).

Augmentative and Alternative Communication (AAC). A system used to facilitate an individual's ability to communicate functionally and effectively. This involves augmenting (supplementing) or altering the mode (replacing) with aided and or unaided symbols. Augmentative and alternative communication is a system or an intervention that incorporates manual signing, pictures or symbols communication boards, and computer technology that

speaks and facilitates the individual's communication abilities. The individual's current abilities are included such as existing verbalizations or speech, signing, gestures, voice output devices (e.g., Dynavox, CheapTalk, BigMac), body language, and facial expressions (American Speech-Language-Hearing Association [ASHA], 2002).

Behaviorism (behavioral psychology). A theory that suggests the behavior of an organism is based on learning via conditioning. In addition, this theory indicates that conditioning occurs through interactions with the environment and is under the control of contingencies contained within the environment. Radical behaviorism states that actions of the organism can be studied in a systematic and observable manner and does not consider the internal mental states of the organism (Hergenhahn, 1992).

Communication board. A communication board is a standalone board or overlay for a communication device, which has the function of facilitating communication. The communication board consists of grids with picture symbols and/or words relating to a task or subject (Peake, 2003a, b).

Echoic (vocal imitation). Echoic is a behavior that mimics the sounds or words produced by the speaker (Skinner, 1957). It has also been referred to as vocal play (Sundberg & Partington, 1998).

Engagement. Engagement is a component of UDL. Engagement is the implementation of strategies to facilitate participation in the learning process for students, including students with disabilities (Spooner, Baker, Harris, Ahlgrim-Delzell, & Browder, 2007).

Expression. Expression is a component of UDL. Expression is the manner students manipulate the classroom learning environment and communicate their knowledge (http://www.ud.center.org/aboutudl/udlguidelines.introduction).

Foundational literacy skills (functional reading). Incorporates skills such as making choices between two books, turning the book right side up, and page turning when appropriate (Browder, Wakeman, & Flowers, 2006) and the ability to identify words or symbols in daily life (Browder, Gibbs, Ahlgrim-Delzell, Courtade, Mraz, & Flowers, 2009).

Individualized Education Program (IEP). A document that includes the student's present level of educational functioning or performance and statements about the student's disability and how it affects the participation and progress in the general educational curriculum (Clayton et al., 2006; IDEA, 2004 sec 614(d) (1) (A) (i)(I)). For students with significant cognitive delays participating in the alternative state assessment, the IEP includes several benchmark pages with measurable annual goals, both in academics (alternative extended standards) and functional instruction with benchmarks or short-term goals. The IEP also lists the related services and supplemental aids/services the student will receive such as program modification, supports provided by the school personnel, therapies (e.g., speech, physical, occupational), health services, accommodations, modifications, and adaptations to school work and assessments (Clayton et al., 2006; IDEA, 2004 614 sec 614(d) (1) (A) (i)(IV); NCLB, 2001).

Intraverbal. Described by Skinner (1957) as a rudimentary verbal operant that is under the control of verbal stimuli. That is, intraverbal behavior is a type of expressive communication, whereas a word or phrase elicits a response congruent with initial phrase. The dialogue does not mimic the initial vocalizations as would be the case in echoic language (Skinner, 1957; Skinner & Partington, 1998).

Literacy (functional literacy). Literacy is the ability of the individual to use words. Literacy is considered the ability to incorporate language to effectively read, write, speak, and listen in order to comprehend concepts (Durando, 2008).

Mand. The term *mand* is a verbal operant in which the response is reinforced by a characteristic consequence and is therefore under the functional control of relevant conditions. The mand can be self-reinforcing in that it has the potential to elicit a desired consequence (Skinner, 1957). Requests or commands are considered mands (Sundberg & Partington, 1998).

Operant conditioning (instrumental conditioning). Operant conditioning is a method of learning that occurs through rewards and punishments for behavior. Through operant conditioning, an association is made between a behavior and a consequence for that behavior (http://psychology.about.com/od/ behavioralpsychology/f/behaviorism.htm; Kazdin, 1994; Skinner, 1957, 1974).

Representation. Representation is a component of UDL. Representation is the learning material used to present the lesson and or content standards, which need to be modified in order for all students, including students with disabilities, to participate in the learning environment (Spooner, Baker, Harris, Ahlgrim-Delzell, & Browder, 2007).

Research-based practices (evidenced, empirical, scientifically-based research). High quality strategies that are based on research that NCLB (2001) states are necessary for students receiving special education to make progress in academic areas. A similar term is scientifically-based research (SBR) meaning methods that produce positive results related to educational activities and programs as well as having met the thorough standards (NCLB; Simpson, LaCava, & Graner, 2004).

Shared story reading (read alouds, storybook reading, story-based lesson, partner reading, shared reading, shared stories, adaptive books, and interactive books). The process of reading a book that is predictive and interactive in nature allowing the student to gain information from the text (Browder, Wakeman, et al., 2007).

Severe and multiple disabilities. The Alabama State Department of Education (ALSDE) eligibility criterion for multiple disabilities is concurrent impairments (e.g., intellectual disabilities/orthopedic impairment) the combination of which causes such severe educational needs that cannot be accommodated in special education programs solely for one of the impairments (Morton, 2009). Severe disabilities encompass individuals who have labels that consist of moderate, severe, profound intellectual disabilities, autism, and multiple disabilities that include intellectual disabilities. These individuals require assistance in major life activities and daily living skills (Westling & Fox, 2000) IDEA has no definition for severe disabilities.

Tact. Skinner (1957) indicated that tact is a behavior under the control of reinforcement contingencies in which the individual is encouraged to make contact with the physical world. Tact is labeling items and actions by the student (Sundberg & Partington, 1998).

Task analysis. A technique used by special educators for identifying and sequencing steps of a task (Moyer & Dardig, 1978; Westling & Fox, 2000). A task analysis is usually a list of the smaller steps necessary to complete a task.

Universal Design for Learning (UDL). A technique that addresses the barriers experienced by learners who are in need of varying degrees of support (CAST, 2010). Universal Design for Learning has been successful in enhancing student learning by employing factors such as *representation, expression,* and *engagement* to allow the student to participate in activities such as progressing toward annual goals and being a participant in the general education curriculum (CAST, Edyburn, 2005; Spooner et al., 2007).

Verbal behavior. A successful approach to communication developed specifically for children with developmental disabilities, in an attempt to augment communication skills. The theory focuses on the functional unit of the words depending on the context and not the spoken

word (Lerman et al., 2005; Skinner, 1957; Sundberg & Partington, 1998). Verbal behavior is the reinforcement of behavior by others (i.e., listeners) who reinforce with a consequence (Frost & Bundy, 2006; Skinner).

Zone of Proximal Development. A student's capability of performing a higher level skill with the assistance of an adult or more advanced individual within the collective. Scaffolding is a process that has the capacity to facilitate the development of an emerging skill into an independent skill (Herb, 1997; Vygotsky, 1993).

Assurances

The following assurances were made when conducting this study:

1. The students participating in the study were receiving special education services and had a current IEP.

2. The students participating in this study had an informed consent signed by a parent or guardian.

Assumptions

Certain assumptions were made when conducting this study:

1. The researcher and other professionals participated in collaborative planning in order to ensure progress toward the task analysis (e.g., reading extended standards; Appendix A) during literacy instruction.

2. The researcher read the story books in an energetic and enthusiastic manner.

Limitations

The following were some potential limitations to this study:

1. The students who participated in this study were from one city.

2. The sample size was small.

3. The sample of students who participated in this study were not randomly chosen but were recommended by the Speech and Language Pathologist (SLP) and/or special education personnel. This was a sample of convenience.

Summary

Chapter 1 established a need for research-based strategies for reading or literacy to instruct students with severe and multiple disabilities, while utilizing alternative standards in order to have access to the general education curriculum. This study adds to the literature of using shared story reading as an effective strategy to teach target literacy skills to students with severe and multiple disabilities. The task analysis provides data to show the success and needs of students with severe and multiple disabilities. Universal Design for Learning encompasses strategies (i.e., AAC, scaffolding skills, intraverbal training) that allow students with severe and multiple disabilities to have an impact on the literacy lesson.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

The purpose for this section is to provide a review of the related research on literacy instruction for students with disabilities. Specifically, the limited research that is relevant to students with severe and multiple disabilities concerning shared story reading will be reviewed. Literacy instruction will be expanded with this study.

Search Procedures

An extensive literature search was conducted in an attempt to locate information and studies directly related to students with severe and multiple disabilities literacy instruction, the use of AAC, scaffolding, and intraverbal training. Other research concentrated on laws relating to students with disabilities participating in the general education curriculum and effective modes of instruction for students with severe and multiple disabilities. Additional searches focused on literacy instruction dealing with students with disabilities, AAC and students with disabilities, evidence-based practices for students with severe and multiple disabilities, literacy and storybook reading, and literacy related to extended standards.

The research of the literature was conducted using manual and electronic searches of peer reviewed journals, government publications, and books. Google and Yahoo search engines were used to locate relevant authors, literature, text, and books. To locate additional information

pertaining to this research, major electronic databases were utilized: (a) Academic Search Premiere, (b) Expanded Academic ASAP, (c) Educational Full Text, (d) ERIC, (e) PsyINFO, and (f) Scout. Various keyword combinations of the following search terms were used: AAC, literacy, reading, extended standards, disability (e.g., severe and multiple, intellectual disabilities), special education, literacy instruction, emergent literacy, emergent reading, literacy readiness, reading readiness, shared storybook reading, task analysis, reading interventions, literacy-based lesson, extended standards, alternative standards, reading instruction, picture symbols, intraverbal, UDL, operant conditioning, verbal behavior, and behaviorism. A research of the literature was conducted using Google and Yahoo to locate various authors' names in combination with the keywords (e.g., Browder, Light, Skinner, Worley).

Intervention

Teaching students with severe and multiple disabilities and other developmental disabilities has vacillated among differing techniques and strategies, periodically over the past several decades. Research has indicated that behavioral interventions are effective methods to teach communication and language skills to students with developmental disabilities. Operant learning theory such as discrete trail training, which is a component of the Lovaas approach (Lovaas, 1987, 1993; about.autism.com/od/treatment options/f/whatisABA.htm), is a successful and proven technique for students with Autism and other developmental disabilities. Incidental teaching is the result of the interactions of an adult and one child during which the child initiates situations that allows the adult to take the opportunity to teach or practice skills such as language (Hart & Risley, 1980). Delay procedures are training that consist of providing a target stimuli and prompting the desired word or response after which delays of time are added (Charlop,

Screibman, & Thibodeau, 1985). Picture exchange communication system (PECS) utilizes pictures with a behavioral approach, such as shaping, to facilitate communication (Charlop-Christy, Carpenter, Le, LeBlanc, & Kellet, 2002; Frost & Bondy, 1998; Spencer, Peterson, & Gillam, 2008). A newer development is the use of access skills (e.g., communication, language, socialization, motor activities) allowing students to participate in the general education curriculum and engage in functional skills (Dymond & Orelove, 2001) in an attempt to gain the knowledge and skills to reach their fullest potential.

Other successful approaches to communication are Skinner's theory (1957) of verbal behavior and task analytical instruction (Westling & Fox, 2000). Verbal behavior was developed specifically for children with developmental disabilities, in an attempt to augment communication skills. The etiology of verbal behavior is grounded in behaviorism and focuses on the functional unit of the words depending on the context and not the spoken word (Lerman, Parten, Addison, Vorndran, Colkert, & Kodak, 2005; Skinner, 1957; Sundberg & Partington, 1998). Skinner's verbal behavior approach to learning language uses the very basics of operant conditioning (e.g., reinforcements, stimulus control). Task analytical instruction, presenting the lesson using an approach that has the task or activity broken down into manageable steps, is another successful approach (Westling & Fox). Special educators who serve students with severe disabilities have implemented task analysis secondary to the benefit of providing individual students with information on progress and a starting point for certain skills as well as development of teaching or curricular programs (Moyer & Dardig, 1978; Snell, 1983; Trela, Jimenez, & Browder, 2010). Task analytical instruction is a research-based method for providing instruction in academic content areas that are consistent with state academic standards (Browder, Trela, & Jimenez, 2007).

Theoretical Framework

Behaviorism is the study or science of behavior (Hergenhahn, 1992; Skinner, 1974). Watson, Pavlov, Thorndike, and Skinner are several pioneers in the area of behaviorism (Kazdin, 1994; Skinner, 1974). Skinner was the most popular or publicized behaviorist (Rutherford, 2000); however, Watson coined the term behaviorism (Schneider & Morris, 1987). The study of human behavior (i.e., behaviorism) also has been referred to as behavioral psychology and radical behaviorism. Radical behaviorism suggests that behavior has the capacity to be studied in a systematic fashion and does not consider the interaction of cognitive mediation in terms of human behavior (Hergenhahn, 1992). Behaviorism is a theory of behavior that is based on learning and indicates that the etiology of all behavior is acquired via conditioning (Skinner, 1974). Conditioning occurs secondary to exposure to environmental stimuli and, subsequently, can be manipulated by a third party (e.g., the teacher).

Operant conditioning indicates that behavior, including that of human subjects, can be conceptualized as operants. In other words, behaviors have a function within the environment, are under the control of external stimuli (i.e., antecedents), and have consequences, which mediate the probability that a given behavior will be repeated (Kazdin, 1982, 1994; Skinner, 1957). The likelihood that a given behavior will be repeated in the future is associated with the consequences (i.e., reward or punishment) produced by the environmental antecedent (Kazdin, 1982, 1994). Through operant conditioning, an association is made between a behavior and a consequence for that behavior (http://psychology.about.com/od/behavioralpsychology/f/behaviorism.htm; Kazdin, 1994; Skinner, 1957, 1974). According to Skinner (1974), operant conditioning suggests that when a behavior elicits a positive consequence, it is feasible that this

behavior will be repeated. Consequently, when a behavior elicits a negative consequence then the probability of recurrence of a given behavior diminishes (Skinner).

The principles of operant conditioning explain the association among behavior and the environment (Kazdin, 1994). There are three primary factors that attribute to human behaviors: antecedents (A), which are the environmental events or stimulus that occur prior to the behavior; behaviors (B), which are responses to the antecedents and are comprised of actions; and consequences (C), which are events that are the results of the behaviors and have the capacity to be reinforcing (Kazdin). Skinner (1957) described the ABC model as a three-term contingency model. For purposes of this research, the researcher employed positive reinforcement, which is a consequence that has the capacity to increase the frequency of a target behavior (Kazdin; Skinner, 1974). Skinner (1957) described communication as a form of behavior and developed the term verbal behavior to describe this interaction. This approach classifies nonverbal and verbal responses as operants, which are related to contingencies presented within the environment of both the speaker and the listener (Skinner, 1957; Sundberg & Partington, 1998).

Skinner's (1957) book, entitled *Verbal Behavior,* described language as a behavior initially produced by stimuli that is manipulated within the child's environment and maintained secondary to specific contingencies (e.g., reinforcements, motivation, extinction, and punishment). Skinner defined *behavior* or *language behavior* as behavior that is reinforced and mediated secondary to the vocalizations of another individual's needs. In other words, Skinner considered verbal behavior or language behavior as a behavior that may be maintained by the same controlling variables as any other operant behavior. In the case of verbal behavior, the operant is the vocalizations that interact with the environment to produce consequences. According to Skinner, responses to questions may be conceptualized as intraverbal responding.

Skinner (1957) indicated that language is a behavior that is learned and is under the control of antecedents within the environment that impact nonverbal behavior. Skinner's verbal behavior is relevant when teaching students with severe disabilities academic content, because operant learning is an affective theory due to the fact that it deals directly with behaviors as related to the environment (Westling & Fox, 2000). Thus, the reason to teach verbal behavior to students with severe and multiple disabilities is to allow them a venue to communicate wants, needs, dislikes in an effort to minimize the occurrence of maladaptive behavior (Carr & Durand, 1985), knowledge, and to participate in literacy activities (Browder, Mims, et al., 2008). Minimizing the occurrence of maladaptive behaviors has the potential to focus attention away from their disabilities and onto the individual's abilities (Carr & Durand). Individuals who gain the ability to communicate have a greater capacity to obtain information from their environment, make choices and decisions, and manipulate the environment in an effort to create a more pleasurable phenomenological experience (Alberto, Fredrick, Hughes, McIntosh, and Chaka, 2007).

Research has indicated that AAC has the capacity to facilitate the production of speech for students with severe and multiple disabilities (Bello-Harn & Harn, 2008; Romski & Sevcik, 1996; Snow & Goldfield, 1983). The methodology associated with the augmentation of speech production is that AAC is reported to decrease the fear of failure and subsequently augments production of verbal communication (Romski & Sevcik). Researchers have suggested that this benefit of AAC is accomplished via allowing individuals with significant delays to circumvent the cognitive and motor demands associated with speech production and focus primarily on communication skills, which also has the capacity to enhance verbal abilities (Romski & Sevcik). Students with severe and multiple disabilities have limited access to participation in

literacy instruction or experiences due to their lack of functional communication (Bellon-Harn & Harn, 2008).

Operant conditioning theory fits neatly into the UDL concept by allowing the environment to be manipulated (e.g., respond to questions, interact with materials and content, and express their understanding in multiple avenues) in a manner to create success for students with severe disabilities (CAST, 2010; Michael & Trezek, 2006; Wehmeyer, 2006). The adaptations and modifications to the curriculum have the capacity to serve as reinforcers for the students in a variety of avenues. The students will be included in the learning process via audio feedback when voice output devices (e.g., Dynavox, CheapTalk, BigMac) are activated, teacher praise, peer encouragement, and actually manipulating the learning environment with the AAC techniques.

Skinner (1974) stated that all human actions, including that of vocalizations, are behaviors that are under the control of operant conditioning. Skinner differentiated between language and verbal behavior in that language is acquired by the individual through the environment and verbal behavior is not confined to vocalizations, but consist of any behavior (e.g., sign language) that has the intent to communicate or interact with the environment (Skinner, 1957). Subsequently, verbal behavior is under the direct control of reinforcement contingencies, which can be manipulated within environment (Skinner). An example that depicts vocal operant behavior is demonstrated as follows: if opening a door is positively reinforced, then the probability of opening the door will likely be repeated, subsequently if requesting that a door be opened via verbal behavior is reinforced by the opening of the door, then the probability of using verbal behavior in a similar situation is significantly increased.

Skinner's (1957) model of verbal behavior did not conform to the traditional structural linguistic model in that it proposed that a functional analysis of language is grounded in operant learning theory. Skinner identified seven different verbal or expressive functions, and differentiated the antecedents and consequences (Tsiouri & Greer, 2003). The seven functions are receptive, echoic, mands, tacts, intraverbals, textual, and transcriptive.

Several types of expressive verbal behavior are noted by Skinner (1957) including echoic, tact, mand, and intraverbal. *Echoic* is a behavior that mimics the sounds or words produced by the speaker. These behaviors can be nonverbal forms of communication such as picture symbols, signs, and verbal approximations. *Tact* is a behavior under the control of reinforcement contingencies in which the individual is encouraged to make contact with the physical world. *Mand* is a verbal operant in which the response is reinforced by a characteristic consequence and is therefore under the functional control of relevant conditions. The mand can be self-reinforcing in that it has the potential to elicit a desired consequence, as defined by Skinner. *Intraverbal* is a rudimentary verbal operant that is under the control of verbal stimuli. That is, intraverbal behavior is a type of expressive communication whereas a word or phrase elicits a response congruent with the initial phrase; however, the dialogue does not mimic the initial vocalizations as would be the case in echoic language (Skinner; Sundberg, & Partington, 1998). An individual can produce one word (e.g., book), which can be representative of all four of the previously mentioned verbal behaviors (Michael & Sundberg, 2001). An example of echoic is the student responding "book" to the teacher saying book while presenting a book. An example of tact is the student filling in the blank, "This is a _____." The mand example is the student responding to the question, what do you want during reading? And the intraverbal is the student responding with the term *book* when asked what do you read? For the purpose of this

paper the research was limited to intraverbal training in response to probes addressed to or trained with the students during literacy instruction.

Behavioral interventions can be effective in training verbal behavior for students with severe disabilities (Sundberg & Partington, 1998; Tsiouri & Greer, 2003). Skinner's (1957) analysis of verbal behavior presented in the book, *Teaching Language to Children with Autism and Other Developmental Disabilities,* is considered the conceptual framework for the assessment of verbal behavior (i.e., language; Sundberg & Partington, 1998). The *Behavior Language Assessment Form* is an instrument to assess language skills that is based on Skinner's (1957) verbal behavior theory was developed by Sunberg and Partington (1998). Intraverbal training was described by Skinner's (1957) verbal behavior theory, which is a viable element of social interaction, academics, and facilitates conversation among individuals (Sundberg & Partington).

Dunst, Brudet, Trivette, Hamby, Raab, and McLean (2001) indicated that learning from the natural environment involving typical everyday activities increases development. Brofenbrenner (1995) stated that children who participate in the daily activities of the family unit will be more advanced due to the characteristics and consequences of everyday natural learning. Everyday activities (e.g., daily living, chores, self-help skills, caring for pets, bath time, meal time, bed time, and story time) provide routines for predictable communication and practice that have the capacity to augment verbal behavior (Brofenbrenner). These skills have the capacity to generalize into educational training of children with severe disabilities. Teaching skills that augment participation in the natural environments of reinforcement includes the ability of the child to answer questions that are appropriate for their developmental level (Ingvarsson et al., 2007).

Intraverbal behavior can be trained or developed in a variety of ways with literacy instruction being a major avenue. Using familiar songs and books, a teacher can create adaptations to cue the student to participate by pointing, eye gazing, or activating a voice output device. By simply singing a song or reading the book, the teacher can elect to omit the last word or fun word allowing the student to choose the missing word (Partington & Sundberg, 1998; Sundberg & Partington, 1998).

Intraverbals are typically presented in the presence of verbal stimuli during which the teacher omits the correct response and reinforcement is provided for successful identification of the desired response. For example, a teacher may ask, "What do we do with a pencil?" The student may respond "write," or demonstrate the act of writing, point to a picture of someone writing, or activate a voice output device providing the correct response after which the teacher would provide reinforcement (e.g., verbal praise, a token, etc.; Kelley, Shillingsburg, Castro, Addison, & LaRue, 2007). The teacher should elicit response patterns from the student in the form of a question, fill in the blank, and request multiple responses via list. This dynamic interaction minimizes the possibility of rote response patterns from the student (Sundberg & Partington, 1998).

An example of intraverbal training using a book is the repeated storyline such as the teacher reading, "It was a terrible," and the student responds "horrible, very bad day." verbally, activating a voice output device, or touching a symbol (e.g., slapping, reaching, or eye gazing). An example of a song implementing intraverbals is the singing of *Ole McDonald Had a Farm*. The teacher and/or the class sing the verse, "*and on that farm he had a*" and the student provides an acceptable response (e.g., naming an animal, pointing, or reaching for a picture of an animal), which can be presented by verbalizing, activating a device, or using picture symbols.

The objective of the teacher is to assist students with disabilities to function within the collective to generate skills that compensate for their disability (Berger 1998; Vygodskaya, 1999). A group of students with cognitive disabilities may extend their *zone of proximal development* (Gindis, 1995; e.g., scaffolding skills) reflected in the student's potential for learning while being taught by an educator (Vygotsky, 1993). Through the zone of proximal development, supports are provided to the student to increase participation in activities: The end goal is for the student to progress in order to obtain independence (Berger, 1998). However, Vygotsky (1978) maintained that interaction between the individual with a disability and individual within their environment provided the most promising potential for remediation. Vygotsky (1978) indicated that learning occurs through social interaction. Vygotsky (1975, 1986) indicated for optimal learning to transpire, three prerequisites must occur. The student must (a) comprehend prototypes of the materials presented, (b) have at least one tactic for comprehending materials presented, and (c) demonstrate an interest in the materials that are presented.

Vygotsky (1993) indicated that a student with a disability could only thrive or learn in a differentiated environment. A special education program should be a specialized environment in which all of the staff are trained to address the individualized strengths of the student (Gindis, 1995; Vygotsky). Special education needs to create a learning environment that provides students with disabilities alternative methods of communication targeted to compensate for their specific deficits. However, Vygotsky stated special education should maintain the same sociocultural goals as the general education curriculum not provide a watered down version of the standard curriculum. A special education program should focus on the aspects of the disability, which are facilitating the negative social interaction among the individual and their

environment (Vygotsky, 1993). The focus of education for an individual with a disability should be on intensification of cultural enlightenment via enhancing the quantity and quality of communication within the culture. The internalization of social signs such as language is an essential factor in assimilating an individual with special needs into the collective (Gindis, 1995). Vygotsky indicated that individuals with a disability could overcome their disability via alternative methods allowing for cultural development. According to Vygotsky, civilization has already begun to accommodate individuals with a disability with the development of numerous methods of adaptations (e.g., sign language, finger spelling, etc.). This statement was made prior to the electronic revolution and in the era of more sophisticated electronic instruments Vygotsky's vision is even more feasible today (Gindis, 1999).

Applying Vygotsky's (1978) model of learning to literacy instruction in order for a student with a disability to succeed, they need to have mediated interaction within the collective. Literacy is an essential element for social interaction; therefore, students with and without disabilities should actively participate in literacy instruction (Kaderavek & Rabidioux, 2004). Emergent literacy skills are considered more than just the recognition of letters and words; they include behaviors (e.g., labeling and pointing to pictures, engagement in shared storybook reading) that are vital in social interaction (Kadervavek & Rabidoux).

Kadervavek and Rabidoux (2004) described a literacy model, *Interactive-to-Independent* model, for structuring goals and supports for students with disabilities. This model is based on Vygotsky's (1978) theory addressing communication, interactions, and social engagement. The model has five stages with the early stages corresponding to the task analysis for shared story reading. The stages are (a) focused attention around shared story reading or other reading material, (b) turn taking in literacy interaction, (c) attaching meaning to text, (d) using literacy

support in social interaction, and (e) reading independently for meaning (Kadervavek & Rabidoux).

Universal Design for Learning

The *American with Disabilities Act of 1990* (ADA) mandated that individuals with disabilities had to be provided physical access to public buildings. This facilitated a movement to retrofit all public buildings to allow individuals with disabilities unfettered access. Ron Mace, a nationally and internationally recognized architect, coined the term *Universal Design* to describe architectural designs for new buildings that would allow access to individuals with a variety of disabilities (North Carolina State University, 2011). The IDEA (1997) Act mandated that states had to provide a free appropriate public education (FAPE) to all students with disabilities. In 1998, the definition of the term Universal Design was expanded to include a learning component and subsequently the term *Universal Design for Learning* (UDL) was developed to describe a universal method of allowing access to the curriculum for learners, including individuals with disabilities (CAST, 2010; McGuire, Scott, & Shaw, 2006; Rose & Meyer 2000). Universal Design for Learning includes four aspects: Teaching, learning, assessment, and curriculum development (Pisha & Coyne, 2001). The focus of UDL is to modify the curriculum, resources, method, and classroom setting (Pisha & Coyne).

The term *Universal Design for Learning* is credited to David Rose, Anne Meyer, and the colleagues at the Center for Applied Special Technology (CAST, 2010). Universal Design for Learning is a technique that addresses the barriers that learners of varying degrees experience (CAST). These techniques have been successful in enhancing student learning by employing factors such as *representation, expression,* and *engagement* to allow the student to participate in

activities such as progressing towards annual goals and being a participant in the general education curriculum (CAST; Edyburn, 2005; Spooner et al., 2007). Educators should develop lesson plans to address the needs and goals of all students in the classroom by employing the components of UDL, which target the barriers often present in the classroom (Spooner et al.). When the components of UDL are applied to instruction, students are allowed access to the materials, learning environment, and accomplishment of goals (Michael & Trezek, 2006).

Representation is the "what" of learning, which is the method that students process and comprehend learning materials in differing ways (http://www.udlcenter.org/aboutudl/udlguidelines/introduction, 9/9/2010). Spooner et al. (2007) defined *representation* as modifications to learning materials used in the classroom that enable students with disabilities to participate in the classroom environment (e.g., adapted or modified books, enlarged print, digital text). *Expression* is the "how" of learning, which is the manner students manipulate the classroom learning environment and communicate their knowledge (http://www.udlcenter.org/aboutudl/udlguidelines/introduction). Expression also allows for various methods of communication for the students who are nonverbal or with limited speech (e.g., voice output devices, sign language, communication boards, computers, graphic programs; Spooner et al.). *Engagement* is the "why" of learning, which is the manner students participate in diverse methodology to facilitate their level of engagement and desire to learn (http://www.udlcenter.org/aboutudl/udlguidelines/introduction). Spooner et al. indicated that engagement consists of implementing strategies to facilitate participation in the learning process for students with disabilities (e.g., providing practice, familiarity, modeling, scaffolding techniques, and opportunities to respond; Hitchcock, Meyer, Rose, & Jackson, 2002; Vygotsky, 1978). According to Spooner et al., if teachers employ the UDL techniques as a guide for developing

lesson plans, then the modification, adaptation, and supports will be incorporated in the original lesson.

An example of UDL facilitating learning of all students in the general education curriculum was presented by Dymond et al. (2006) in a study that described the process of designing a content subject area. The purpose of the study was to investigate an approach that could be used to redesign a general education content area (e.g., science), while encouraging access for students with severe disabilities. The participants were one general education science teacher, one special education Unified Science co-teacher, and one special education case manager. The student participants were high school students in the general education population who were at risk for failure and students with disabilities ranging from mild to significant cognitive disabilities (Dymond et al.).

The researcher collected data from questions concerning the curriculum, instructional formatting, participation, materials, and types of assessments gathered from a weekly 2-hour after-school meeting, interviews prior to and post-intervention, journal of the general educator, reflection information from participating teachers, minutes from all meetings, and responses from focus group meetings post-intervention. Data analysis was the implementation of a content analysis procedure and streamlined to specific themes. All of the sources of data collection were used for triangulation and multiple researchers participated in the process of analyzing the data (Dymond et al., 2006).

The results were that the participants had more available options for interactive opportunities, three of the four participants with significant cognitive disabilities mastered skills in social development and interactions with others. The researchers concluded that although it required an enormous amount of time, energy, monitoring, planning, replanning, and

implementation for the redesigning of a course to incorporate UDL components, the participating teachers saw the benefits of UDL for teachers and students, which encouraged them to remain committed to the cause (Dymond et al., 2006).

The implication of the study, the most important aspect, is to make changes toward an UDL environment. For this study the two classroom teachers became proficient in working collaboratively in planning, delivery of lessons, modifying, and accommodating individual student needs. One primary theme was to start with small changes that were likely to make the biggest impact while continuing toward the more comprehensive objectives (Dymond et al., 2006).

Augmentative and Alternative Communication

Individuals with disabilities who use augmentative and alternative communication (AAC) have increased abilities to communicate basic needs and provide a conduit to convey previously obtained knowledge about the world (South Carolina Assistive Technology Project, 2004). Communication is essential in our daily lives, school, employment, relationships, and acquiring basic needs. Classroom teachers have access to a variety of AAC devices and systems in order to facilitate learning for students who need adaptations or modifications. Interventions using AAC are beneficial to more than the students with language delays, but also students with intellectual and developmental disabilities (e.g., Down's syndrome, Autism Spectrum Disorder, Rett Syndrome, and cerebral palsy; Wilkinson & Hennig, 2007).

Lloyd (1985) described augmentative communication as the process of enhancing an individual's existing speech abilities in order to facilitate comprehension by a third party (i.e., supplement to speech). Lloyd defined AAC as developing a substitute for verbal communication

for an individual who has limited or no verbal abilities. In other words, one is augmenting speech whereas the other is developing avenues that can be used as an alternative to verbal abilities. Lloyd and Kangas (1988) stated that as a general practice the term AAC should be employed to describe this intervention strategy in order to develop consistency among practitioners and in the literature. Zangari, Lloyd, and Vicker (1994) indicated that professionals are neither augmenting nor providing alternatives to verbal communication, but are in fact working to improve the ability for an individual to communicate.

Augmentative and alternative communication is defined as a system that facilitates an individual's ability to communicate functionally and effectively in multiple settings (American Speech-Language-Hearing Association [ASHA], 2002). This involves augmenting (e.g., supplementing) or altering the mode of response (e.g., replacing) with aided and/or unaided systems (ASHA). Aided systems are devices that facilitate interaction between the teacher/parent and the student. Aided systems require an external device to manipulate the environment, which include apparatus such as picture symbols, communication boards, and voice output devices (e.g., Dynavox, CheapTalk, BigMac). Unaided systems typically are those that do not require the use of external devices. Such systems typically include sign language, body language, facial expressions, and gestures (Mirenda, 2003; Romski & Sevcik, 2005; Wilkinson & Hennig, 2007). Both systems are essential when teaching students with severe and multiple disabilities who demonstrate no functional communication (Browder, Flowers, et al., 2008) in learning and participating in the classroom instruction.

Students with severe and multiple disabilities often are dependent on individuals within their environment (e.g., parents, teachers) to provide and program a device that allows them to interact in multiple environments (Schepis & Reid, 2003). When progressing toward a state

reading extended standard such as gaining information from the text, students with severe disabilities benefit from instruction using strategies involving sight word cues, teacher cheat sheets, and AAC (Browder & Cooper-Duffy, 2003). Students with severe and multiple disabilities who have concurrent deficits in verbal behavior often lack control over their environment and possess limited capacity to express basic needs and/or desires (Wright, 2008) thus the need for AAC to allow these students to compensate or participate. The use of picture symbols to augment communication has two advantages over other forms of AAC: simplicity of use and necessity of minimal fine motor coordination (Frost & Bondy, 1998). Students with limited ability to express basic desires or knowledge can point, reach, or eye gaze to communicate via picture symbols. Unlike sign language, which requires adequate fine motor skills, unaided forms of AAC (e.g., gestures, symbols, objects, and body language) are preferred due to ease of use by students with severe and multiple disabilities, particularly when confronted with an inability to communicate (Frost & Bondy).

Dyches, Davis, Lucido, and Young (2002) conducted a study involving the instruction of operating two different types of AAC (i.e., communication board and voice output device) focusing on the ability for these skills to generalize into the community. The participant was a female student with multiple disabilities including moderate intellectual disabilities, cleft palate, spina bifida, and hydrocephalus. The student was instructed on correct procedures using a task analysis (e.g., asking the time, ordering food) for each device (Dyches et al.).

The data collection consisted of observing the number of independent usages of AAC, number of community responses, and the number of people in the community to comprehend the participant's request(s). The data analysis consisted of a table with total numbers of AAC usages, community responses, and comprehension of request(s). The results of 16 visits to stores within

the community were that the participant was proficient with both devices, completing all steps of the task analysis with 100% accuracy, attention (i.e., eye contact) was directed to the participant during 10 visits, and 10 of the 16 members of the community were able to comprehend the participant's request(s) (five for both devices were not understood and one person was not English speaking). Both devices were equal in results of effective usage, attention, and comprehension.

In conclusion, after the intervention stage, the student was successful with both devices involving all steps of the task analysis. However, the communication board device was more effective in terms of generalization into the community due to the voice output device's volume being not as effective in a noisy environment. The implications of the study are that teachers who experience success through their students using AAC may arrange more instruction and opportunities to allow for AAC engagement, which has the added result of self-confidences and self-determination for the students who communicate with AAC (Dyches et al., 2002).

Literacy with AAC

Research has suggested that individuals with severe disabilities can benefit from effective AAC interventions for the following reasons: these individuals exhibit problematic behaviors when confronted with inappropriate symbols (e.g., ones that do not match the context) and/or verbalizations, which the student is unable to comprehend and a communication breakdown may result during an inability to verbally respond (Snell et al., 2006). Children with severe and multiple disabilities (e.g., Autism, Cerebral Palsy) learn language with tremendous effort when compared to children without disabilities who obtain these milestones at expected rates. In many instances, the development of expressive communication is an arduous task for the individual

with a disability and has the potential to result in significant delays in verbal communication (Nigam, Schlosser, & Lloyd, 2006). Successful mastery of verbal or language behavior is a major goal for many parents and teachers of children with disabilities (Lerman et al., 2005; Skinner, 1957). When an individual fails to obtain adequate communication, successful interaction with other individuals and academic performance are delayed (Romski, Sevcik, & Adamson, 1999).

Riffel et al. (2005) conducted a study using a transition class to access a palmtop computer (PC) for instruction. The PC was programmed with visual and auditory prompts paired with task analysis to assist the students with the job to be performed while using this program. The focus of this study was to investigate whether student training on a palmtop computer with the Visual Assistant program minimizes the necessity for prompts from the instructor. In addition, the study investigated the effects the program had on increasing the number of independent steps completed in the task analysis (Riffel et al.).

The participants were four students, ages 16-20, enrolled in a special education transition class (mild to moderate intellectual disabilities as well as other disabilities). The researcher collected data on the number of prompts required to complete the task by each participant, the time required by each participant to complete the task, and the number of verbal instructions provided to each participant during the task performance. Data were converted to percentages and presented in a graph. Data presented on the graphs indicated the percentage of steps that were completed without prompts from the instructor and the amount of time needed to complete a task. An analysis for multiple-probe-across-multiple-students was employed to measure the number of prompts required, duration of task, and verbal instructions via a table representing the means, percentages, and ranges (Riffel et al., 2005).

The results of this study were that three of the participants indicated a reduction in mean number of total prompts from baseline to follow-up. One participant presented with a reduction in mean number of total prompts from baseline to intervention. Three of the four participants were able to utilize the Visual Assistant program independently to complete their task at follow-up. The participants were able to complete more steps in the task independently using the program. The researchers concluded that participants were able to complete the task with fewer verbal prompts and a decreased rate of errors; however, the time to complete that task was not significantly decreased. The implications of the study suggested that the option to hear the instructions more than once increases productivity, and participants with intellectual and developmental disabilities can benefit from the use of the handheld PC-based technologies in transition-related tasks (Riffel et al., 2005).

Alberto et al. (2007) conducted a study that focused on whether participants with moderate to severe disabilities were able to identify the businesses represented by the logos and distinguish a product of the target business. Participants included six students, three middle school students and three elementary students, who were enrolled in special education classes for students with moderate to severe intellectual disabilities. The researcher collected data on unprompted correct responses for each student. Data analysis consisted of the rate at which a participant could successfully identify the logo of a business and a product that is available at the corresponding business. These data were a graphic representation of the correct number of responses by each participant. The data indicated that during baseline none of the participants identified logos but at maintenance all participants were identifying 12 logos and products 100 % correctly (Alberto et al.).

The results of this study indicated that the instruction of identifying logos was successful for all participants. When in the community for generalization probes, each student was able to identify 12 logos and name a product that could be purchased in the store with one error. The researchers concluded that this study provided effective instruction for the reading of logos in the community and comprehension by naming a product produced at the establishment representing the logos. Implications of the study were that instruction enables increased independence by providing information with which to make basic decisions, such as which store to enter for a select product. Logo reading or environmental reading is a factor in functional literacy for participants with moderate to severe disabilities. Functional literacy can facilitate the participants' communication skills, independence, and choice making (Alberto et al., 2007).

Erickson, Koppenhaver, Yoder, and Nance (1997) studied literacy interaction using AAC (i.e., Dynavox) to acquisition of literacy as well as communication skills. The study focused on how the general classroom might influence the literacy learning of a participant with severe speech and physical impairments, what role(s) assistive technology might play in school-based literacy activities, and how direct interventions might influence the participant's literacy learning. The participant was an 11-year-old male student with severe physical impairments, moderate to severe cognitive impairments, spastic cerebral palsy affecting hand use, mild to moderate visual impairment, and nonverbal. The participant was able to operate a motorized wheelchair with assistance (Erickson et al.).

The researcher implemented the intervention for year one, observing the participant. The researcher collected data via unstructured interviews, review of pertinent documents, and researcher notes. Data collection for the second year consisted of classroom visits, interview, and review of pertinent documents. During the entire study, a comparative analysis of all data was

utilized (Erickson et al., 1997). The results were that the participant progressed from 6 to 40 squares on the Dynavox messages screen, wrote sentences, spelled up to four letter words correctly with continued access to the Dynavox program for spelling, and independently accessed a book, which are all skills developed by the general education students in elementary grades.

The researchers concluded that the participant exhibited continuous improvement in his attainment of literacy skills during the intervention phase of the study. The study indicated that the participant was successful because of opportunities allowing him to be actively engaged in learning. Instruction in a reading group using a small group format was employed, which allowed increased active participation. The participant received instruction in literacy using a Dynavox with preprogrammed messages then progressed to expressive communication. Intervention included listening to stories read aloud, books using photographs, and magazine pictures to depict favorite stories, which were then captioned programmed into Dynavox. The implication of this study was that the participant's success is an example of the necessity to provide intervention with monitoring to allow the integration of language arts skills for better attainment of literacy and communication skills. The intervention indicated the progress that can be made when a supportive environment with high expectations of parents and teachers assist in the acquisition skills (Erickson et al., 1997).

In an example of literacy instruction, Erickson and Koppenhaver (1995) investigated instruction of literacy acquisition via technology for students with severe and multiple disabilities receiving services in a self-contained special education classroom. The researchers investigated increases that participants with multiple disabilities made in literacy skills by actively engaging in a program that utilized technology to provide access to instruction and

learning. The participants consisted of eight elementary students; two of these students were selected for the case study. Within this population, seven students were in wheelchairs, six had cerebral palsy, one had spina bifida, and one had an unspecified degenerative disease. Three of the students had severe speech and language impairments; four students could talk, however, it was unintelligible to unfamiliar listeners; and one student was language delayed (Erickson & Koppenhaver, 1995).

The researcher collected data on two target participants, which consisted of case notes detailing adaptations and devices used for instruction. The data analysis consisted of case notes for two target participants detailing and giving results for adaptations and devices. In addition, IEP goals were monitored for progress (Erickson & Koppenhaver, 1995).

The results of the study were that four of the eight participants returned to their neighborhood elementary schools. One participant entered the general education classroom. The participants presented with various degrees of success, but all of the participants were afforded the opportunity to participate in literacy instruction, allowed to be more independent, and provided tools to enable responses with and to questions as well as make comments.
The results of the two target participants indicated successful reporting of calendar events (e.g., day of week, weather, and special activities).

Participant 1 was able to independently complete her assignment of using a calendar to write short statements about the weather, the date and other relevant information. The researchers indicated that incorporating Keytalk (e.g., a word processing program) into the intervention facilitated the participant's success. The researchers also incorporated Touch Talker (e.g., voice output device) into the literacy instruction. The participant progressed from producing sentences relating to the calendar to activating icons that produced a programmed

verbal representation for each page in the book. The participant's ability to discriminate text evolved to the point where she was able to narrate an entire classroom play.

Participant 2 was able to correctly respond to question relating to the calendar by eye gazing at picture symbols attached to Plexiglas. This participant also was able to listen to books on tape by activating a switch on the tape recorder. Participant 2 was able to correctly answer questions about the book via eye gaze.

The researcher indicated that after implementation of literacy instruction via technology, Participant 1 developed as an emergent reader and writer, while Participant 2 developed in the area of increases in word recognition. Participant 2 progressed from identifying picture symbols to identifying words via eye gazing. The data collection was comprised of biweekly meetings to discuss goals, objectives, and implementation of these goals and objectives into the curriculum throughout the instructional day. Daily lesson plans were reviewed to ensure that technology was incorporated.

The researchers concluded that the participants were provided with a wider range of literacy learning opportunities than previously experienced. All of the participants developed improvements in literacy skills after completion of the intervention (Erickson & Koppenhaver, 1995). The implications of the study are that with technology, participants with severe disabilities can participate and make progress in the general education curriculum (e.g., literacy). General education teachers can rely on the expertise and support from other trained professionals, which can facilitate progress in addressing the literacy needs of all students (Erickson & Koppenhaver).

Myers (2007) conducted action research concerning participants who use AAC and the process of language and literacy. The participants were four students, ages 5 to 9, who have

various disabilities (e. g., cerebral palsy, traumatic brain injury, seizure disorder). The researcher collected data using various language assessments, observations of technology usage, work performance samples, videotaping, and field work observations. Two of the participants had case studies and notes detailing their progress. Data analysis from assessment results consisted of raw scores presented on a table (Myers).

The results of this study indicated that all of the participants revealed increases on language assessments. Field observations, work performance samples, and video tapes indicated that all participants made gains in participation and independence. All of the participants displayed increased communication intentions, but only two of the participants generalized these skills to the school setting. The researchers concluded that the intervention program incorporating AAC for participants with severe speech and physical disabilities improved participation in the general education curriculum. The implication of the study was that in order for participants using AAC to become successful and interactive in the general education curriculum, the administration will have to ensure appropriate teacher training, transitions phase, and parent input (Myers).

Kliewer (2008) authored an ethnographic action-based study that investigated the inclusion of participants with significant developmental disabilities who had IEPs. The overall purpose of the narrative was to demonstrate the progress in literacy development of these participants when included with typical peers in an environment that promotes all the students in the classroom as members of the literate community. The participants were members of seven inclusive classrooms for preschool and kindergarten students (Kliewer).

The researcher collected data via adult interviews, observations of participants, descriptions of how the participants decoded the symbols (i.e., the participant's symbols and

peer's symbols), relevant documents (e.g., IEPs, notes from parents and teachers, literacy tasks), assessments, and field notes. Data analysis consisted of a sociogram for each classroom to analyze each participant's interactions within the group during various intervals (i.e., planned and spontaneous) of the day involving literacy interactions. The results of this study indicated that all of the participants engaged in literacy activity that increased communicative intent. All of the participants developed that capacity to use symbols or words with meaningful intent (Kliewer, 2008).

The researchers concluded that participants with significant developmental delays can progress while engaging in planned literacy tasks and events with teacher guidance in an inclusive setting. The implications of the study suggested that when teachers plan, manipulate the environment, and involve all students in literacy activities, students are more likely to benefit from classroom instruction (Kliewer, 2008).

In summarizing the previous studies, the use of AAC devices and techniques has proven successful for students with disabilities, including students with severe and multiple disabilities. It is a process that requires planning on the teachers' part and training on the students' part. The students who use AAC are able to access and participate in the general education curriculum with greater efficiency. The majority of students who use AAC are limited in their interactions with literacy instruction and materials secondary to communication issues (Myers, 2007). Interaction is more than simply verbal interaction among peers. Peer interaction can consist of nonverbal communication (e.g., the use of picture symbols) and involve the entire class (e.g., teachers, parents, and peers; Sontag, 1996). Literacy instruction for students with intellectual disabilities remains eerily similar to the instruction from the 1990s, with the exception that in the current decade the LEA as mandated by federal legislation will provide instruction to ensure that

all students will be adept readers during their formative years as prescribed by NCLB (2004; Erickson & Koppenhaver, 1995; Rao, 2009).

Intraverbal Behavior

The intraverbal communication training for students with severe disabilities can subsequently increase the communication interactions of students with peers, teachers, and significant others (Bruce & Vargas, 2007). Intraverbal is one of seven types of verbal behavior as noted by Skinner (1957). The intraverbal was described by Skinner as a rudimentary verbal operant that is under the control of verbal stimuli (Lerman et al., 2005). That is, intraverbal behavior is a type of expressive communication whereas a word or phrase elicits a response congruent with the initial phrase; however, the dialogue does not mimic the initial vocalizations as would be the case in echoic language and is beneficial to teaching language (Michael & Sundberg, 2001; Skinner; Sundberg, & Partington, 1998). Mastery of the other three expressive behaviors is not required before training of intraverbal skills can be initiated (Sundberg & Partington). When students with severe disabilities do not attend to reinforcements in the learning environment, explicit training in intraverbal behavior becomes a strategy (Michael & Sundberg).

Skinner (1957) indicated that language was a learned behavior whose etiology is under the control of similar environmental factors/variables that have been identified to control nonverbal behavior (i.e., stimulus control, motivating operations, reinforcements, etc.). Skinner's assessment of verbal behavior can direct parents and professionals in making decisions concerning instructional strategies for a student in respect to augmentative communication. Choosing a type of augmentative communication regularly encompasses a decision between

verbal behavior that is a communication-based form (e.g., picture exchange communication system; Frost & Bondy, 1998) versus verbal behavior that is a topography-based form (e. g., sign language; Michael & Sundberg, 2001; Shafer, 1993). Intraverbals are established in programs designed to teach such skills as responses to common questions and statements, replying to general knowledge questions, and linking items according to their functions, features, or categorical class (Petursdottir, Carr, Lechago, & Almason, 2008; Sundberg & Partington, 1998). However, these skills also can be taught in fun entertaining scenarios. The abovementioned skills can be executed using a physical response (e.g., pointing or activating a voice output device).

Goldsmith, LeBlanc, and Sautter's (2007) study stated that it is beneficial to teach intraverbal behavior to students diagnosed with Autism using transfer-of-stimulus-control procedures with errorless learning to target categorical intraverbals. The participants for this study were three males, ages 4 to 7, diagnosed with Autism. The researcher collected data recordings of all correct, nonrepeated responses, and the process continued until all categories had been assessed (i.e., target function of objects or class, clothing, furniture, colors, or animals). Data analysis included a graphical depiction of the correct intraverbal responses for each participant (Goldsmith et al.).

The results of the study indicated that Participant 1 responded appropriately to 19 of 20 pictures, Participant 2 responded appropriately to 15 of 20 pictures, and Participant 3 correctly responded to 18 of 20 pictures. All three of the participants attained the goal of categorical intraverbals. The researchers concluded that the study supported Skinner's (1957) position that language could be successfully taught via behavioral teaching strategies. The implication of this study was that teaching intraverbal behavior to children with Autism and developmental delays

is an essential goal due to the fact that it can contribute to daily interactions and functional communication (Goldsmith et al., 2007).

Ingvarsson, Tiger, Hanley, and Stephenson (2007) focused their research on generalization of the mand to known and unknown questions following training of responses (i.e., “I don’t know’ and “I don’t know, please tell me”) and whether acquisition of correct answers to unknown questions emerged. Direct intraverbal training has the potential to benefit students with communication deficits. This training consisted of cueing appropriate intraverbal answers following the question (e.g., by presenting pictures, text, or other stimuli that stimulate the target response), and then fading the cues in order to convey the correct verbal response. The participants for this study consisted of four male students attending an inclusion preschool program. Three males were receiving special education services and one male was a typically developing student with English as a second language. The researcher collected data that consisted of the teachers recording responses using data sheets that were specifically prepared for each session (i.e., including the question, the correct answer, and precoded letters corresponding to the responses). Data analysis evaluated the performance of each participant in terms of percentage of independent answers and was presented on a graph (Ingvarsson et al.).

The results of the study indicated that acquisition of knowledge was significantly increased for all participants. From baseline when no questions elicited a correct response to intervention, 12-62% of unknown questions were correctly answered. This study indicated that the procedure involving the teaching of the response “I don’t know” after unknown questions led to acquisition to the unknown question. Three of the four participants generalized the “I don’t know” response to previously correctly answered questions, which required additional intervention to untrain. The second response of “I don’t know, please tell me” resulted in

acquisition with the target unknown questions and generalized to untrained unknown questions. One participant presented notable increases in the number of correct answers. The researchers concluded that this intervention produced favorable results to responding to questions (i.e., known or unknown). The implication of the study suggested that acquisition of “I don’t know, please tell me” responses may contribute to the acquisition of correct answers due to the positive role model of correct responses (Ingvarsson et al., 2007).

Braam and Poling (1983) conducted a study that focused on effectively training individuals with intellectual disabilities to emit several different intraverbal responses to the same verbal stimulus when it was repeated using transfer of stimulus control procedures. The participant in condition one was a 17-year-old female with intellectual disabilities and hearing impairment. The participant was able to employ sign language consisting of approximately 200 signs used for tacts and very limited mands. The participant in condition two of the study was a 17-year-old male with intellectual disabilities who was speech/language impaired. This participant also used sign language with approximately 200 signs used for mands mostly in imitation. In a third condition, the same female from condition one was used and a 23-year-old male with intellectual disabilities who was hearing impaired. The male participant was also familiar with sign language and had a vocabulary of approximately 500 signs used for tacts (Braam & Poling).

The researcher collected data during each session (i.e., baseline, training, and follow-up probes), and recorded the correct unprompted intraverbal response for each stimulus and response. Data analysis consisted of the percentage of correct unprompted responses presented graphically. The results of this study indicated that all participants illustrated between 80-100% accuracy in three of five categories during follow-up. The researchers concluded that that

transfer of stimulus control operations is a technique that produces positive results for individuals with intellectual disabilities utilizing intraverbal behavior (e.g., classification and categorization). The implication of this study suggested that behavior sequence is a training strategy for the beginning language learner. Teachers may do well to first establish intraverbal responding regardless of its correctness. Then, once intraverbal behavior is emitted frequently, accurate responding can be obtained by differently reinforcing correct response to the stimulus category or class as determined by the verbal practices of the learner's verbal community (Braam & Poling, 1983).

Luciano's (1986) study was a systematic replication of Braam and Poling's (1983) study involving the training of intraverbal skills using categorization by transferring stimulus control techniques revealed successful outcomes using errorless learning. The goal of this study was to implement transfer stimulus control procedures with individuals with poor verbal behavior in an attempt to improve the intraverbal skill of classifying, with the major difference of the added vocal response. This type of learning allowed these participants to exhibit novel interactions and generalize new skills. The participants for this study were three teenagers with intellectual disabilities and other disabilities (e.g., cerebral palsy and Cockayne's syndrome). All of the participants received training in alternative settings (i.e., home and private clinic; Luciano).

The researcher collected data consisting of the correct number of responses emitted after the immediate prompts were recorded. The correct responses produced before presentation of any prompt were recorded as incorrect responses. The specific category of responses was recorded to determine the number of different responses per session. Data analysis consisted of graphical representations of percentage of correct responses and number of different responses per session. The results of the study indicated that after intervention all participants obtained

80-100% correct responses. The researchers concluded that two participants illustrated improvement of intraverbal behavior after training, and generalization occurred in all stimulus classes. A third participant increased his intraverbal responses after training productive intraverbal in only one of the two stimulus classes (i.e., vehicles) and generalized with one stimulus class (i.e., foods). The implication of this study was this type of training and procedures permits participants to learn new skills sets that facilitate interaction (Luciano, 1986).

Taken together the studies indicated that intraverbal training allows the participant with severe disabilities the opportunity to interact in more than reading comprehension, it also affords the student an avenue to obtain knowledge, interact socially, and contribute to the lessons (Goldsmith et al., 2007). Intraverbals such as answering wh-questions, yes/no responses, predicting what a story is about, and identifying characters or objects in a story are all skills presented in literacy instruction. These are naturally appearing skills presented during reading and interacting with books. In many instances, students with severe and multiple disabilities receive minimal literacy instruction involving evidenced-based practices (Browder, Ahlgrim-Delzell, Courtade, Gibbs, & Flowers, 2008; Justice & Kaderavek, 2004).

Literacy with Storybooks

Research has indicated that shared storybook reading has the capacity to augment the early reading and comprehension skills for students with disabilities (Institute of Educational Sciences, 2007). Shared story reading has been referred to as read aloud, literacy-based lessons, storybook reading, shared reading, adaptive books, and interactive books (Browder, Gibbs, et al., 2009). Using shared story reading with students who have severe disabilities provides a

magnitude of benefits even when the student is nonverbal. Blyden's (1988) experience with reading excitedly or energetically to these students provided receptive language skills. Blyden (1988) conducted observations on participants with multiple disabilities and concluded that the reading process with oversized books that contain pictures increased participants' attentiveness and interaction with the teacher and other students, increased discrimination, and increased attention to detail. The possibilities for the participants are numerous. Blyden suggested that the participants can include the whole school, entire class, and/or groups of 18-20 children on the same approximate cognitive levels, but encouraged groups that promote interaction (Blyden).

Blyden (1998) witnessed the varied needs of participants with disabilities being addressed by the implementation of repeated shared story reading, increased attention, and language. Blyden reiterated the benefits of repeated reading are increased comprehension, confidence, vocabulary and text, possibly increased eye contact, and positioning with a responsive audience, which are also important elements contained in Skinner's (1957) verbal behavior. Blyden indicated that teachers can alter student behavior, foster language growth, and motivate poor and nonreaders through the utilization of multiple stimuli-signing, vocalization, large books, and pictures that capture students' attention (Blyden).

Browder, Wakeman, and Flowers (2006) conducted a review of the literature related to reading instruction for participants with significant cognitive disabilities. The authors found 128 studies addressing literacy with students with disabilities. However, the focus of this review was on vocabulary development through sight word recognition. The studies reviewed concentrated on phonics training (13), phonemic awareness (5), fluency (36), and comprehension skills (31). The results indicated that participants with severe disabilities can use symbols to facilitate

learning literacy-related skills but the other areas of literacy have limited research to facilitate learning, especially comprehension skills (Browder et al.).

According to Browder, Ahlgrim-Delzell, et al. (2008), shared story reading is an avenue that can be utilized to increase reading skills (e.g., comprehension, fluency, and word meaning). The study explored the development of a literacy program for participants with intellectual disabilities targeting communication needs and literacy instruction. The participants were 23 elementary students enrolled in self-contained special education classrooms. The participants were divided into two groups: 12 in the control group and 11 in the treatment group. The treatment group consisted of five levels of literacy instruction (i.e., *Early Literacy Skills Builder*, story-based lesson, site words/pictures, phonics, and other literacy; (Browder, Ahlgrim-Delzell, et al.).

The researchers collected data from the N*onverbal Literacy Assessment, Early Literacy Skills Builder,* and two standardized language measures. Data analysis was a series of mixed analyses of variances (ANOVAs) with one between- and one within-subjects factor to determine differences between the treatment and control groups. The results of the study indicated that all of the participants progressed to at least level one: six participant reached level 2, three participants reached level 3, and one participant reached level 4 and level 5. The conclusion of this study was an expert panel accepted the formation of an early literacy curriculum that could be implemented with participants with severe disabilities. The participants displayed gains in skills necessary to become readers. The implications of this study were that participants with severe intellectual disabilities can obtain skills of early literacy, shared story reading seems to provide enjoyment of books, and shared story reading promotes language skills (Browder, Ahlgrim-Delzell, et al., 2008).

Studies have indicated that participants with severe intellectual disabilities using voice output devices and scaffolding strategies in connection with shared story reading demonstrate higher levels of engagement in the story, were exposed to print, and resulted in some increases in language or communication skills (Bellon-Harn & Harn, 2008; Liboiron & Soto, 2006). Scaffolding skills are considered prompts, cues, supports, and models that assist in learning (Bellon-Harn & Harn; Liboiron & Soto). Pairing the two techniques during shared story reading is advantageous to the learner and the teacher secondary to the knowledge that the student is able to convey to the teacher.

Liboiron and Soto's (2006) study used shared story reading to address scaffolding strategies used to facilitate a student's active participation and to focus on the semantic complexities employed by the reader during reading. The participant was a fifth grade female who had cerebral palsy with limited mobility. Some assistive technologies that the participant used were a motorized wheelchair, Intellikeys keyboard, and Dynavox (Liboiron & Soto).

The researcher collected data in the form of verbatim transcription of videotaped story reading between the participant and a SLP. Data analysis consisted of two phases in order to measure both the SLP and the participant's responses. Phase one was the total number of conversational turns performed by the participant and SLP within the task based on the book length. Phase two consisted of the scaffolding strategies employed by the SLP during interactions. The SLP and the participant's interactions were used to code scaffolding strategies. The results of this study indicated that 360 conversational turns occurred between the participant and SLP during shared storybook reading. Of the 360 conversational turns, 168 were made by the participant and 192 by the SLP, with 96 being scaffolding strategies. The researchers concluded that shared story reading interactions produced a language rich environment that is

conducive for focusing on communication and literacy skills of participants with deficits in communication. The study also indicated that shared story reading encouraged communication and exposed participants to print conventions. The implications of this study were that interactions with shared story reading and scaffolding strategies have the potential to expose participants with severe disabilities to their creative side (Liboiron & Soto, 2006).

Bellon-Harn and Harn (2008) conducted a study that examined repeated shared story reading with scaffolding strategies and expanded these strategies to employing intervention using AAC in an effort to augment verbal expression. The participant was a 6-year-old girl with a diagnosis of moderate to severe intellectual disabilities; legally blind; and developmentally delayed in gross motor, fine motor, language, social, and self-help skills. The participant used a voice output device with enlarged picture symbols (Bellon-Harn & Harn).

The researchers collected data consisting of audio taping the sessions in order to code all scaffolding strategies used by the trainer and all utterances by the participant. Data analysis included language and speech samples, which were examined using the Child Language Analysis computer program. Results of these analyses were presented on a graph. The results of the study indicated that the participant produced an increase in utterances when AAC was added to shared story reading. Additional increases in utterances were noted when scaffolding was introduced. Voice output devices increased participation but did not decrease the participant's verbal utterances (e.g., the participant continued to interact using both the voice output device and vocalizations). The researchers concluded that positive changes occurred in that there was an increase in the number of utterances emitted (i.e., oral, AAC, and AAC with scaffolding). The implication of the study was that voice output devices augment the number and value of interactions during repeated story reading (Bellon-Harn & Harn, 2008).

Koppenhaver, Erickson, Harris, et al. (2001) conducted a study to examine the interventions (i.e., hand splinting of resting hand, assistive technologies, AAC techniques and devices, parent training). The participants were six young girls diagnosed with Rett syndrome who exhibited severe limitations in verbal communication. The researcher collected data consisting of videotaping of all reading sessions by the family. Data analysis consisted of examination of the communication mode (e.g., vocalization, pointing) and action coding during participation in the storybook reading. The communication act (e.g., labeling pictures by any modality) that this study focused on was labeling (i.e., using any form, commenting, or responding to questions). A graph was employed to illustrate means, frequencies, and range of correct responses for the participants (Koppenhaver, Erickson, Harris, et al.).

The results of the study indicated that all six participants attempted to communicate during reading of both familiar and unfamiliar books. After AAC devices and training were introduced into the reading sessions, attempts to communicate increased to more than one per minute for all six participants. The researchers concluded that during phases III and IV, with the introduction of assistive technologies, the participants increased their use of symbolic communication (i.e., pointing to pictures or activating voice output devices, which the mothers were recognizing and responding). The researchers concluded that hand splinting of the nondominant hand increased communication for one participant during phase II. The implications of this study were that mothers and their daughters with Rett syndrome can gain multiple benefits from reading books with supports and the interactions have the capacity to facilitate communication skills and language opportunities (Koppenhaver, Erickson, Harris, et al., 2001).

Koppenhaver, Erickson, and Skotko's (2001) study expanded the previous study by targeting the participants' modes of communication, training the parents to understanding, and expanding their daughter's communicative efforts. Training was provided to the mothers to engage their daughters interactively with the storybooks that are familiar and unfamiliar, asking questions, and waiting for a response. The participants were four young girls diagnosed with Rett syndrome that exhibited severe limitations in verbal communication and were also participants in the previous study (Koppenhaver, Erickson, & Skotko).

The researcher collected data consisting of videotapes of the participants and mothers reading both familiar and unfamiliar storybooks. Data analysis was coding of communication modes and acts by the participants during storybook interactions. Each phase of the study illustrated each participant's communication modes and acts by minutes and frequency presented on a graph. The results of this study indicated that after the presentation of AAC during phase III, all four participants increased labeling and commenting. During phase IV, after parent training with AAC, three of four participants increased activation of the voice output device. The fourth participant continued to use the voice output device at the previous rate (i.e., no increase was noted). The researchers concluded that all of the participants made gains in communicative intent, labeling, and activating voice output devices correctly and frequently; however, pointing to pages in the book with pictures decreased. The implications of this study were that participants with multiple disabilities benefit from and succeed with AAC symbols (e.g., depicting characters and related vocabulary) and voice output technologies being available in the environment. Implementation of AAC devices and techniques conducted daily and on a regular basis have the capacity to augment a participant's communication skills and knowledge base even when the

devices employed are not the most technologically advanced form of intervention (Koppenhaver, Erickson, & Skotko, 2001).

Skotko, Koppenhaver, and Erickson (2004) expanded the previous two studies by reporting on the relation between actions of the mothers' and participants' communication modes and actions. The participants were four young girls diagnosed with Rett syndrome that exhibited severe limitations in verbal communication and participated in the previous studies. The mothers of the four girls were also participants in that they modeled appropriate interaction with picture symbols (Skotko et al.).

The researcher collected data that consisted of videotaped reading of a storybook twice per week. Data analysis was a calculation of frequencies of the target variables, which was ascertained by the division of observed target behaviors by the minutes it took to read the storybook, and then the frequencies were plotted so trends could be evaluated. Each mother-child dyad was presented in two multiple regressions allowing the parent variables that determined their child's labeling and responding (Skotko et al., 2004).

The results indicated that by phase IV the participants were activating the AAC device (i.e., single message), which was statistically significant as compared to a random occurrence. The mothers of the participants were asking questions to allow the participant to predict and make references, expanding the book for the child by relating it to their lives, and using pictures in the book to label, describe, and encourage their child to comment. The single-message AAC device was activated more frequently. The researchers concluded that each mother used intervention strategies that enabled her child to interact and these strategies were different among the mothers. The implications are similar to the previous two studies. Participants with multiple disabilities can become more communicative and participate in learning situations when assistive

technologies are made available. The researchers are confident that the same interactive and communicative results achieved in the home setting could be replicated in the school setting (Skotko et al., 2004).

A similar study involving Latino children and their parents was conducted by Rosa-Lugo and Kent-Walsh (2008). The study focused on the parents implementing the targeted interaction strategy, generalizing the strategy to new storybooks as well as the child, and communicative turns with AAC during storybook reading. The participants were two parent-child dyads of Latino descent. The children were at least 3 years of age, used an AAC system, and exhibited speech impairment. The parents had to be fluent readers of children's books in English and/or Spanish and report a history of engaging in reading (Rosa-Lugo & Kent-Walsh).

The researchers collected data that consisted of videotaping of the parent-child interaction and was later transcribed. Data analysis consisted of a graph to demonstrate percentages of strategies implemented by the parents and the participants' communicative terms. The results of this study indicated that parents were able to maintain implementation of appropriate strategies during story book reading at a 90-100% rate of efficiency. The participants were able to maintain communicative turn taking at a rate of 85% or greater. The researchers concluded that parent training and competency in the implementation of AAC has the capacity to augment the ability of the participants to successfully participate in communicative turn taking while engaging in shared story activities. The implication of this study was that interventions that incorporate parents and other important people are more effective in addressing the needs of children with communication impairments (Rosa-Lugo & Kent-Walsh, 2008).

In a study involving individual and group storybook reading, Trudeau, Cleave, and Woelk (2003) developed a program implementing storybook reading with adaptations for groups

of participants with various communication needs, which targeted parent tendency to implement these adaptations at home. The participants were six mother and child dyads in a preschool program. The participants consisted of five boys and one girl: three were typical; one had severe speech, physical, and cognitive impairments; one had Down syndrome; and one had specific language impairment. One participant with severe intellectual disabilities participated in all activities with the use of modeling and prompting with communication boards and voice output devices (Trudeau et al.).

The researcher collected data that consisted of a transcription of all videotaped sessions. Data analysis consisted of coding the transcription using a variation of the Light and colleagues coding system. Each interaction was analyzed for the mode of communication, targeting 12 distinct modes (e.g., action, sign language, communication board). The results of this research indicated that all of the participants employed AAC in both an individual and group setting, but at varying degrees. The researchers concluded that an interactive reading program employing adaptations increases group participation and interaction within the home environment. The implications of the study indicated that it is beneficial for participants with severe disabilities to participate in interactive groups due to the fact that this venue provides the opportunity for modeling. Participants with various communication and verbal skills benefit from adapted books due to increased participation and emergent literacy (Trudeau et al., 2003).

Browder, Trela, Jimenez (2007) conducted a study in which training was provided to middle school language arts teachers. Teachers were trained to use a literacy lesson template that incorporated task analysis, prompting student responses, and self-monitoring. The participants were three middle school special education teachers and six middle school students who had

moderate to severe intellectual disabilities or Autism. The participants were selected by their respective teachers (Browder et al.).

The researchers collected data consisting of observing the teachers' presentation of a literacy lesson with the assistance of an adaptive book. The researchers tracked the number of steps the teacher performed in the 25-step task analysis. The participants were tracked for correct independent responses with a possibility of 12 responses. Data analysis was a graphical representation of each participant's total number of independent responses and each teacher's total number of steps completed on the task analysis. The results of this study indicated that teachers maintained fidelity with all 25 steps of the task analysis. The participants were able to increase the number of correct responses during literacy instruction as depicted by the task analysis. The researchers concluded that the teachers' success in implementing the task analysis targeting literacy-based skills had a direct effect on students achieving independence with early literacy skills (e.g., page turning, recognizing vocabulary in a story, ability to respond to questions using the book). The implication of the study indicated that participants with moderate to severe disabilities can participate in the general education curriculum with adaptations to books and presentation of information (Browder et al., 2007).

Browder, Gibbs, et al. (2009) advocated a conceptual model of literacy to teach reading skills to participants with severe disabilities. The model has two main points for allowing participants with severe disabilities to obtain literacy skills. Point one was that these participants needed to have access to real literature that was functional in their lives. This included literature in the following areas: daily activities (e.g., movie schedule, cookbook), obtaining information about their community (e.g., newspaper, fliers), world information (e.g., various textbooks, magazines), information about other people (e.g., biographies, novels), or enjoyment (e.g., comic

books, stories). This access to literature can be gained from read alouds in which the participant interacts with the text and reader. Point two of the model was to allow for independence of the reader. The educational system should allow these participants access to the reading program to try to teach the five components of reading (i.e., phonemic awareness, phonics, comprehension, vocabulary, and fluency) that is afforded to other students (Browder, Gibbs, et al.; Ming & Dukes, 2009). The goals of the model are enhancement of life through shared reading, access to literature with meaning, and to promotion of independent readers. The model targets shared reading to augment listening comprehension skills and participating in the sharing of information gained from the text facilitated through AAC (Browder, Gibbs, et al.).

Stephenson (2009) conducted a study addressing what effects reading books adapted with symbols would have on participants with severe intellectual disabilities in their ability to utilize the symbols receptively and expressively within the context of the book. The study also examined whether the participants could comprehend the verbalizations of what the target symbol represented. The participants were four students with severe intellectual disabilities and no intelligible speech (Stephenson).

The researcher collected data that consisted of observing the participants during shared story reading and counting participant responses that were tracked on a record form (i.e., title of a book and questions asked). Data analysis consisted of a graphical representation of each participant's total number of correct responses during all phases of the study. The results of the study indicated that the participants made gains in their ability to communicate using the symbols. The participants pointed to pictures, were beginning to respond to questions using the pictures, and became more attentive to the story. The participant's ability to discriminate pictures and understand the relation between symbols and the book was emerging (Stephenson, 2009).

These results were similar to Koppenhaver, Erickson, and Skotko's (2001) research. The researchers concluded that the intervention allowed the participants to become more interactive during literacy instruction as indicated by increased shared story reading and response to symbols. Other improvements were noted such as participation in reading books, shared attention, and receptiveness to the story as well as the target symbols. The implication of the study was that adapted storybook reading augments success in other areas academics and instruction (Stephenson, 2009).

Browder, Mims, et al. (2008) designed a study implementing task analysis and principles associated with UDL as a method to teach participants with multiple disabilities via shared story reading. The participants were three students enrolled in special education with limited inclusion. The participants were profoundly mentally retarded, nonresponsive during literacy instruction, and exhibited a developmental level of age 1 or less (Browder, Mims, et al.).

The researcher collected data during story-based lessons by recording the participant's responses for the steps of the task analysis. In addition to the data from students, the researcher collected data specifically related to utilization of the UDL components. Data analysis was visual representation of the total number of independent correct responses for the steps on the task analysis for each participant. The results of the intervention were that all three of the participants increased the number of steps completed independently from baseline to intervention. Participant One responded correctly to 6-8 steps during baseline and 12-15 steps correctly during intervention. Participant Two increased from 3 correct responses to 7-13, and Participant Three went from 2 correct responses to 6-11 steps completed independently. The researchers concluded that the facilitation of UDL components during shared story reading allowed the participant an avenue for active and independent engagement. The implication of the study was that the same

positive results of increased participation that occurred in a special education classroom can be repeated in an inclusive classroom if the same attention to team planning using the components of UDL is implemented (Browder, Mims, et al., 2008).

Mims, Browder, Baker, Lee, and Spooner (2009) conducted a study involving participants with visual impairment who interact in literacy instruction through shared story reading. Participants with severe and multiple disabilities present with diverse disabilities. The study assessed whether a system of prompting (i.e., least-to-most) the participants would increase the responses to comprehension questions from a story-based lesson. The participants were two elementary students with visual impairment and severe intellectual disabilities (Mims et al.).

The researchers collected data on each participant's response to10 questions during a shared story for each shared story reading. The participants' responses were choosing the correct object from two objects for10 preplanned comprehension questions relating to each story. Data analysis was a graph of each participant's total number of responses (i. e., unprompted and correct) for each story read (Mims et al., 2009).

The results were that all participants revealed increased comprehension during multiple opportunities to answer questions after each page was read. The participants were able to use the objects that related to each page of the story to gain understanding, which led to better comprehension of the stories. The researchers concluded that least to most prompting is a successful intervention to facilitate participation in and comprehension of literature for a variety of participants with disabilities, especially participants with communication impairments. The implications of the study were the real objects connected to pages in the book facilitated

comprehension and augmented both participants' increased responses and could be an effective intervention for participants with other severe disabilities (Mims et al., 2009).

Similar to the previous studies encompassing instruction using task analysis, Spooner, Rivera, Browder, Baker, and Salas (2009) utilized story-based lessons with cultural contextual literature. Spooner et al. conducted a study to examine the success of teaching a paraprofessional to use a task analysis to promote emergent literacy skills for an elementary student of Latin descent. Using story-based lessons, a (Latina) paraprofessional would adhere to a task analysis to encourage interaction from a participant. The participants were a 6-year-old girl who was an English-language learner with moderate intellectual disability and autistic behaviors and the paraprofessional who was also a research assistant. The task analysis steps were sequenced in smaller chunks and chained to make presentation easier for the paraprofessional and to allow the participant to master a few steps before additional steps were presented. The participant and paraprofessional were part of a self-contained special education classroom (Spooner et al.).

The researcher collected data that consisted of recording the correct and independent responses to chained steps on a task analysis. The task analysis had 14 steps in four chained sequences. Data analysis was a visually graphic representation of correct responses. The results indicated that the participant made gains with the intervention using cultural-based books (e. g., Spanish) and the intervention continued to be effective when the participant participated in English storybook reading. The researchers concluded that culturally contextual books facilitated increased book awareness, comprehension, and generalization to English instruction for the participant who was an English learner with moderate intellectual disability and autistic behaviors. The participant was able to apply what she had learned throughout the intervention when there was a return to English instruction only. The implication of the study was that the

Latina paraprofessional alternating between English and Spanish while instructing the participant was a contributing factor to the success of the participant (Spooner et al., 2009).

Students with severe intellectual disabilities and or multiple disabilities have gained access to literacy through the use of AAC. Using a shared story reading, these students are exposed to interactions with literacy and language (Katims & Pierce, 1995), participation, vocabulary (Moerk, 1985; Ninio, 1983), and comprehension (Blyden, 1988; Ninio & Bruner, 1978). All of these skills are related to the Alabama reading extended standards (see Appendix A; Morton, 2006), which relate directly to the general education curriculum.

Several researchers have stated that progressing in literacy skills is a practical life skill that is beneficial to all students, especially students with severe intellectual disabilities (Browder, Gibbs, et al., 2009; Koppenhaver & Erickson, 2003; Soto et al., 2001). Consistency is an essential element in teaching students with severe and multiple disabilities communication skills. School is an environment with a routine that is predictable and provides practice. Research has suggested that shared story reading, which develops with the natural environment, is more likely to generalize into the realm of academia (Kent-Walsh & Rosa-Lugo, 2006). Subsequently, shared story reading is an activity that establishes emergent literacy skills (Kent-Walsh & Rosa-Lugo) and has predictable rituals in the natural context (Liboiron & Soto, 2006). Because shared story reading is a natural and reoccurring activity in many homes, it offers materials and opportunities for joint attention and intentional interactions between mother and child (Skoto et al., 2004) and can generalize easily into the school environment. Despite the fact that individuals with disabilities have legal statute to ensure the implementation of an appropriate education, these students are frequently overlooked (Browder, Wakeman, & Flowers, 2006). Utilizing story- based lessons for middle school students with moderate to severe disabilities is one

method of providing engagement in the text to gain knowledge when providing instruction using task analysis (Browder, Trela, Jimenez, 2007).

Summary

Taken together, the literature demonstrates that shared storybook reading provides multiple benefits for student with severe and multiple disabilities. Reading instruction is a routine during which teachers can employ collaboration techniques to encourage success for students with severe and multiple disabilities. Students with severe disabilities should be afforded the opportunity to obtain similar benefits via daily readings with supports from a partner or teacher to facilitate active engagement of reading materials (Browder, Gibbs, et al., 2009). As mandated by NCLB (2001) and IDEA (2004), students with significant cognitive disabilities must participate in the general education curriculum (e.g., alternative standards) and the techniques used to instruct these students must be research-based interventions that have been proven effective with this population.

Augmentative and alternative communication is an integrated group of four components (e.g., symbols, aids, techniques, and/or strategies) used to enhance communication skills and interaction for individuals with disabilities (Sevcik & Romski, 2000). Augmentative and alternative communication is defined as an intervention or an approach that has the capacity to augment the individual's full complement of communication abilities. These abilities may include preexisting speech or verbalization, gestures, vocalization patterns, manual signs, story/communication boards, and voice output devices (American Speech-Language-Hearing Association [ASHA], 2009; Romski & Sevcik, 1997). Universal Design for Learning (UDL) considers AAC an avenue to ensure student progress in the general education curriculum by

planning modifications to the curriculum for students with disabilities. Teacher can use UDL components and techniques (e.g., AAC) to address the challenge to provide students with intellectual disabilities an effective way to meet their needs (Sigafoos & O'Reilly, 2004) and adhere to the law while allowing participation in the general education curriculum (IDEA, 2004; NCLB, 2001). The actual meetings to implement UDL components require an evaluation process to answer questions about what is functional and has the capacity to be successful for individual students with severe and multiple disabilities (Blyden; CAST, 2010).

In order to prepare a successful environment for students with severe and multiple disabilities to participate and learn in the general education curriculum, collaboration between the special education teacher, general education teacher, and other professionals is essential (Cushing et al., 2005; Downing & Eichinger, 2003; Soto et al., 2001; Spooner et al., 2007; Wolfe & Hall, 2003). Using shared story reading to promote learning for students with severe and multiple disabilities requires careful planning. The UDL components assist classroom teachers in preparing for all students' learning. Through a team planning approach students with severe and multiple disabilities gain access to general education curriculum content areas (e.g., literacy) via supplemental aids and services (e.g., AAC and intraverbal training; CAST, 2010; Edyburn, 2005; Spooner, Baker, Harris, Ahlgrim-Delzell, & Browder, 2002). As mandated by NCLB (2001) and IDEA (2004) students with disabilities must have access and make progress towards the general education curriculum.

Students with severe and multiple disabilities participate in shared story reading by engaging in intraverbal behavior. The result of this interaction is measured by intraverbal responses to the questions presented on questions relating to the story (i.e., a task analysis) (Ingvarsson, Tiger, Hanley, &Stephenson, 2007). Intraverbal behavior is established in programs

that have been developed to facilitate responding to questions and statements, replying to general knowledge questions, and linking objects to function or feature or categorical class (Sundberg & Partington, 1998), which are skills present in shared story reading.

In looking across the body of research, 1 of 15 studies that were discussed utilized the UDL components with shared story reading for students who have severe and multiple disabilities to teach target literacy skills in the school setting (Browder, Mims, et al., 2008). Four of the studies used task analysis with shared story reading for students with moderate to severe disabilities in the school setting (Browder, Mims, et al., 2008; Mims, Browder, Baker, Lee, & Spooner, 2009; Browder, Trela, & Jimenez, 2009; Spooner, Rivera, Browder, & Salas, 2009;). Five studies used shared story reading for students with severe and multiple disabilities in the home setting to facilitate communication and interaction (Koppenhaver, Erickson, Harris, et al., 2001; Koppenhaver, Erickson, & Skoto, 2001; Rosa-Lugo, & Kent-Walsh, 2008; Skotko, Koppenhaver, & Erickson, 2004; Trudeau, Cleave, & Woelk, 2003). Nine studies used shared story reading for students with other disabilities such as moderate intellectual disabilities to vision impairment to teach literacy skills in the school setting (Bellon-Harn & Harn, 2008; Blyden, 1998; Browder, Ahlgrim-Delzell, Courtade, Gibbs, & Flowers, 2008; Browder, Mims, et al., 2008; Browder, Trela, & Jimenez, 2009; Liboiron, & Soto, 2006; Mims, Browder, Baker, Lee, & Spooner, 2009; Spooner, Rivera, Browder, & Salas, 2009; Stephenson, 2009).

Of the four studies using task analysis, all of the participants exhibited increases in appropriate responses to target literacy skills (Browder, Mims, et al., 2008; Browder, Trela, & Jimenez, 2009; Mims, Browder, Baker, Lee, & Spooner, 2009; Spooner, Rivera, Browder, & Salas, 2009). In the one study using UDL and shared story reading, the participants exhibited increases in appropriate responses (e.g., predict what the story is about, complete repeated

storyline) as presented by improved scores on each step of the task analysis, which relate to the UDL components (i.e., representation, expression, and engagement; Browder, Mims, et al.). During this study the participants received the intervention on an individual basis within the school setting (Browder, Mims, et al.).

The theoretical framework for this study is grounded in Skinner's Operant Conditioning Theory and Vygotsky's Sociocultural Theory. This study used elements from both theories in conjunction with UDL components within the context of shared story reading to increase participants' interaction and comprehension. Operate conditioning theory is consistent with UDL in that both allow manipulation of the environment in a manner to facilitate success for students with severe disabilities (CAST, 2010; Michael & Trezek, 2006; Wehmeyer, 2006). Skinner's (1957) verbal behavior can be an effective strategy when teaching students with severe disabilities academic content, due to the fact that verbal behavior is associated with behaviors related to the environment (Westling & Fox, 2000). According to Skinner (1957), acquiring literacy skills are behaviors (e.g., labeling, pointing) similar to those described by Skinner's verbal behavior. Therefore, one incentive to teach verbal behavior to students with severe and multiple disabilities is to allow them an avenue to communicate their desires. Providing a method for students with severe and multiple disabilities to communicate is an effective strategy to facilitate participation in literacy activities (Browder, Mims, et al., 2008). Once the ability to communicate has been successfully achieved, this ability can generalize into the community. This ability provides the opportunity for the participant to assimilate information from their environment, and subsequently manipulate their environment in an effort to create a more pleasurable phenomenological experience (Alberto, Fredrick, Hughes, McIntosh, & Chaka, 2007).

Vygotsky (1993) indicated that exposure to a differentiated environment was the only viable approach to augment learning for participants with severe and multiple disabilities. According to Vygotsky (1975), a small group format creates an environment that is conducive for learning to transpire secondary to social interaction. Teachers who develop strategies that target the participant's strengths as well as deficits within a small group setting create an environment that is conducive to learning. Vygotsky (1993) indicated that it is the responsibility of the teacher to develop a zone of proximal development, in which supports are provided to the student to assist them in performing activities which the student is not yet able to complete independently. During this process, the teacher arranges social interaction and offers assistance to the participant, gradually transitioning the participant toward independence. Examples of this technique are scaffolding, guided practice, modeling, and motivation. The goal of this process is for the participant to progress to the point of achieving independence (Berger, 1998). According to Vygotsky (1978), achieving independence in terms of possessing sufficient literacy skills in order to effectively communicate is an essential element for successful social interactions.

In terms of the behavioral theory that supports this research, Skinner's (1957) book, *Verbal Behavior,* described language as a behavior in that language is initially produced by stimuli that is manipulated within the child's environment and maintained secondary to specific contingencies. The classroom environment created by the teacher and peers has the capacity to provide the requisite secondary contingencies to facilitate interaction as well as participation of the individual with severe and multiple disabilities. Students with severe and multiple disabilities often have limited ability to participate in literacy instruction due to insufficient functional communication skills (Bellon-Harn & Harn, 2008). Research has indicated that AAC has the capacity to close this gap in functional communication skills by allowing an avenue for

individuals with multiple disabilities an adaptation, which, in many instances, is sufficient to circumvent their disability and focus primarily on communication skills (Romski & Sevcik, 1996). When presented with appropriate AAC devices that are directly related to the activity (e.g., communication boards, objects), students are able to engage and interact with the context of shared story reading in an atmosphere that is more conducive to learning.

Communication can be trained or developed in a variety of ways with literacy instruction being a major avenue. Intraverbal training is one such method to develop literacy instruction, which was described by Skinner's (1957) verbal theory. According to Skinner's verbal behavior theory, intraverbal training is a viable element of social interaction, academics, and facilitates conversation among individuals (Sunberg & Partington, 1998). Intraverbal training can be accomplished by the teacher presenting instruction using fill in the blank, questions, and requests in multiple responses via a list to elicit responses from students in an effort to minimize rote learning patterns (Sundberg & Partington, 1998).

Research indicates that special education programs should consist of a specialized environment in which all of the staff are trained to address the individualized strengths of the student (Gindis, 1995; Vygotsky, 1993). A method to identify specific strengths and weaknesses for students are team planning meetings. During team planning meetings, various UDL components can be examined to target students' individualized plans in order to address their progress toward specific academic goals. Appropriate implementation of UDL components that focus on literacy instruction create a language rich environment that is interactive in nature. This environment has the capacity to target acquisition of literacy and language skills for students with disabilities (Liboiron & Soto, 2000).

Rationale for the Study

The IDEA Act (2004) and NCLB Act (2001) mandated that students with significant cognitive disabilities would receive a quality education toward the general education curriculum, make progress toward those goals with strategies that have been proven effective with this population, and participate in state assessments. Current research examining effective strategies for the students with severe and multiple disabilities, indicate that access and participation in age appropriate activities and curriculum while in their infancy are essential skills (Browder, Trela, & Jimenez, 2007) and that the ability to listen to age appropriate curriculum is a viable skill that is promoted via shared story reading (Browder, Trela, & Jimenez). Since the research on specific strategies that have been proven effective to meet academic content standards for individuals with significant cognitive disabilities is limited supplementary research to examine additional strategies is imperative.

The limited research suggests that shared storybook reading has the potential to become an effective instrument for teachers when providing instruction to individuals with disabilities in either an individual setting or in a small group format (Al Otaiba, 2004). However, to date, there has not been any published study incorporating UDL components when presenting shared story reading with a task analysis to individuals with severe and multiple disabilities within the context of a small group format. Furthermore, no published studies have examined the ability of participants to generalize acquired skills to new material and maintain these skills over time. This study examined all of these components in an effort to expand the literature and facilitate the ability to augment the rate at which individuals with severe and multiple disabilities could learn target literacy skills. Considering the fact that the majority of teachers address goals and needs of their students in a small group format, the study had the capacity to be incorporated into

the curriculum (Browder, Ahlgrim-Delzell, Courtade, Gibbs, & Flowers, 2008; Browder, Mims, Spooner, Ahlgrim-Delzell, & Lee, 2008).

Because this study sought to compare participant performance during specific treatment conditions, with a limited sample size, over a predetermined timeframe, a single subject research design was deemed the most appropriate to employ (Kazdin, 1982; Wolery, & Dunlap, 2001). Single subject research has been used for decades to determine the efficacy of intervention strategies for special education (Tawney, & Gast, 1984). Research indicates that numerous intervention strategies that are currently used within the field of special education were derived from a single subject research design (Horner et al., 2005).

Current research is limited in the fact that only one existing study has incorporated UDL components within the context of shared story reading for individuals with severe and multiple disabilities while measuring the results via a task analysis. None of the currently published studies employed all of the aforementioned techniques in a small group format within a school setting for individuals with severe and multiple disabilities. Vygotsky (1978, 1993) indicated that the interaction between individuals with a disability and their peers within the context of a specialized environment provided the most promising potential for learning. In addition, no published studies contained follow-up phases to ascertain whether participants' acquired skills could be generalized to novel materials and were maintained over time. This study employed comparable techniques to those utilized by Browder, Mims, et al. (2008) while expanding the techniques to small group instruction. Furthermore, this study examined the ability of participants to generalize learned skills to novel material and the ability for participants to maintain learned skills over time within the context of small group instruction. This study expands the limited research in the field by measuring participants' ability to interact and engage

in shared story reading as measured by a task analysis. In addition, this study adds to the research knowledge base by examining the ability of participants with severe and multiple disabilities to generalize new material as well as maintain previously learned materials over time with a small group format.

The research indicates that shared story reading is a key component in literacy instruction for individuals with severe intellectual disabilities (Browder, Mims, Spooner, Ahlgrim-Delzell, & Lee, 2008). Using shared story reading is a technique that fosters communication and literacy development (Spooner et al., 2009). Research has indicated that students who participate in shared story reading typically gain access to the general education curriculum at higher rate than peers who do not receive this type of intervention (Browder, Gibbs, Ahlgrim-Delzell, Courtade, Mraz, & Flowers, 2009). Further, research has indicated that the success experienced by students exposed to the process of UDL in the literacy instruction promotes self-esteem through the act of participation, gaining knowledge, sharing knowledge, and positive reinforcement from the teaching staff (Browder, Mims, et al.). Skinner's (1974) Operant Conditioning Theory stated that when a behavior elicits a positive consequence (i.e., reinforced) from another individual the likelihood that this behavior will be repeated is increased. Furthermore, verbal behavior (i.e., communicative intent) is under the direct control of reinforcement contingencies which can be manipulated by individuals (e.g., teachers) within the environment (Skinner 1957, 1974). Therefore, the implementation of UDL techniques to promote literacy skills via shared story reading has a sound theoretical framework.

Research has indicated that shared story reading is the avenue to develop the UDL environment for students with severe and multiple disabilities (Browder, Mims, et al., 2008; Spooner et al., 2007). Vygotsky (1975, 1986) indicated that three conditions must be satisfied in

order for optimal learning to transpire: (a) comprehend prototypes of the materials presented (representation; CAST, 2010), (b) have at least one strategy for comprehending the materials (expression; CAST), and (c) demonstrate and interest in the materials that are presented (engagement; CAST). Enhancing student learning by employing the UDL factors of representation, expression, and engagement allows the students to progress (CAST, 2010; Edyburn, 2005; Spooner et al., 2002) and are consistent with Vygotsky's ideas. Browder, Mims, Spooner, Ahlgrim-Delzell, and Lee (2008) combined UDL factors with literacy instruction using shared story reading with individual students with multiple disabilities.

Task analysis strategies have been used in the school setting to teach a variety of skills (Browder, Trela, & Jimenez, 2007; Moyer, & Dardig, 1978; Snell, 1983; Trela, Jimenez, & Browder, 2010), one of which is reading. Current research indicates that task analysis have been effective when employed in an individualized setting (Browder, Mims, et al., 2008); however, more research is needed to investigate the potential of UDL components with shared story reading using task analysis for students with severe and multiple disabilities in a small group setting, with new materials, and maintaining learned skills over time. Implementation of the *Task Analysis for Shared Stories* in conjunction with UDL techniques provides the teacher with a template of strategies to present standards to students with severe and multiple disabilities to facilitate participation in literacy lessons. This strategy provides an avenue to facilitate independent and correct responses by students with severe and multiple disabilities. Teachers providing small group instruction can use the task analysis as an assessment tool to measure the abilities of students with severe and multiple disabilities in reading, which should facilitate progress towards participating in general education curricula.

This study replicated and extended the methodology established by Browder, Mims, et al. (2008). This study built on the Browder, Mims, et al. study by using the UDL components with shared story reading using task analysis in a small group format, with new materials, and maintaining learned skills over time. Data were collected on the participants' learned skills during small group format, with new materials and maintaining learned skills over time. The UDL components (i.e., representation, expression, and engagement) were used for each step of the task analysis for shared story reading for two small group format settings. Three study participants for each small group qualified for inclusion in this study.

CHAPTER 3

METHODOLOGY

The purpose of this study was to determine whether the implementation of UDL components via shared story reading increased response skills (e.g., book selection, comprehension of book) through participation in small group literacy instruction using task analysis (Browder, Mims, et al., 2008; Spooner, Baker, et al., 2007). This study included an intervention using a task analysis for shared story reading that was implemented during small group instruction. The intervention strategies were developed by a planning team, which discussed specific UDL components (i.e., representation, expression, and engagement) for each step of the task analysis for all participants. Members of the planning team consisted of the researcher, special education teacher, SLP, occupational therapist (OT), physical therapist (PT), parent, paraprofessionals, principal, general education teacher and special education administrator. While all of the aforementioned individuals were considered team members, the only constant members of the team were the researcher and special education teacher. This study expanded the research of the Browder, Mims, et al. study by measuring the independent correct responses of the participants in small group instruction while implementing shared story reading using UDL components. This study addressed several of the limitations discussed by Browder, Mims, et al. and expanded their study to examine whether participants were able to utilize newly acquired skills to novel materials during the generalization phase. The study further expanded the Browder, Mims et al. study to explore whether the participants were able to maintain learned

skills over time (i.e., with the previously presented books and materials) during the maintenance phase.

The baseline phase for school one consisted of 10 days for participant 1, 10 days for participant 2, and 7 days for participant 3. The baseline phase for school two consisted of 16 days for participant 4, 13 days for participant 5, and 15 days for participant 6. The disparity in the number of baseline sessions among the participants was secondary to student absences and weather days. Despite the discrepancy in the number of baseline sessions, definitive trends were apparent. Baseline data were collected to determine the participants' current level of performance in completing steps of the task analysis prior to the implementation of the intervention. A detailed explanation of participants' performance during the study will be discussed in chapter 4.

The planning team reviewed the data for each participant and each step of the task analysis to determine what strategies would be effective and the materials needed to complete the adaptations. Once successful strategies were identified for each participant, the strategies were incorporated into the intervention phase during shared story reading within the context of small group format. The planning team made modifications of UDL techniques throughout the intervention phase as needed to achieve optimal participant interaction and engagement with the shared story reading. These modifications were continued when new materials were presented during the generalization phase to ascertain whether the participants utilized the learned skills with novel materials. The same modifications were used to ascertain if the participants maintained the learned skills over time during the maintenance phase.

One objective of this research was to facilitate independent correct responses for participants. In order to facilitate independent correct responses (i.e., choose book to read, attend

to chosen book while title and author were read, attend to materials used to introduce theme of story, make prediction when asked “what do you think the story is about?” while being presented with two objects, focus on objects when named in the story and displayed to the participants, participate in reading by completing a repeated storyline, react to name embedded within the story, react to surprise element within the story, when presented with objects used for prediction and asked, “What was the story about?’ choose correct object, and when asked, “Do you want to read it again?’ indicate yes or no; see Appendix A) UDL components (i.e., representation, expression, and engagement) were employed under the auspices of learning opportunities within the general education curriculum as they related to literacy instruction. Another objective of this study was to increase engagement and interaction with shared story reading for all participants.

This study initially focused on identifying successful strategies for students with severe and multiple disabilities within a small group format. The planning team identified successful strategies using UDL components for each step of the task analysis for all participants (see Appendix B). The planning team reviewed each participant’s baseline data then documented strategies (see Appendix B) to assist each participant in obtaining the maximum number of independent correct responses on the task analysis for shared story reading. Once successful strategies (e.g., auditory scanning, proximity, wording, cues, positioning, OT exercises, PT exercises) were identified for each participant, the strategies were incorporated into shared story reading during small group instruction. After the participants completed the intervention phase, the focus of the study shifted to ascertain whether participants could generalize the newly acquired skills to novel materials. The final phase of the study examined the ability for participants to maintain previously learned skills over time.

Universal Design for Learning is a technique that has been used for including students receiving special education services within the general education classroom and curriculum (CAST, 2010). The UDL components of representation, expression, and engagement were the primary focus during the team planning meeting for literacy instruction. The UDL techniques incorporated AAC devices, scaffolding, and intraverbal training techniques in an effort to promote independence and participation within a small group format.

The researcher used a score sheet for shared story reading (see Appendix G) to collect data on independent correct responses for the participants. During the team planning meetings, the researcher and other professionals discussed implementation of UDL components and techniques. The task analysis was scored by the researcher and teacher who worked with the participants on a daily basis. For the purposes of this study, only the independent responses were scored (e.g., eye gaze, activating device, and reaching). General reactions and nonresponsiveness also were recorded in an effort to facilitate and improve participant engagement via UDL techniques. In an effort to facilitate participant engagement in shared story reading, this study consisted of data collection for baseline, intervention, and follow-up phases (i.e., generalization and maintenance). The follow-up data collection was implemented in two phases. The first phase, generalization, collected data pertaining to the participant's ability to employ previously learned skills to new materials and the second phase, maintenance, collected data pertaining to the degree to which these learned skills were maintained over time.

Baseline data were collected to determine the participants' current ability to participate in shared story reading. Baseline data provided the initial information relating to trends and variability among the data, which served to provide a point of reference pertaining to the participants' ability (Kazdin, 1982). During the intervention phase, UDL components were used

as part of the team planning and as part of the shared story reading. During the generalization phase of the study, the researcher read a different book using adaptation (i.e., replacing main character with participants' names, adding repeated storyline, and adding a surprise element). The steps of the task analysis (see Appendix A) also were employed during the generalization phase to measure participant comprehension and interaction. After completion of the generalization phase a 1-week intermission was implemented; therefore, the participants were not exposed to the original three adapted books for 2 weeks. Then the researcher initiated the second half of the follow-up phases (i.e., maintenance) to determine the number of independent correct responses (i.e., level of knowledge retained) the participants maintained as measured by the task analysis (see Appendix G).

Research Questions

The purpose of this study was to determine whether the implementation of UDL via shared story reading increases response skills through participation in literacy instruction with intraverbals and AAC. The following research questions were answered:

1. What are the effects of the components of UDL on the number of independent correct responses for students in small group instruction to progress through a shared story as measured by the task analysis? (P. Mims, personal communication, January 6, 2010).

2. To what extent does the team planning process to individualize instruction generalize to shared story reading with a different book as measured by the task analysis? (P. Mims, personal communication, January 6, 2010).

3. What are the effects of the components of UDL on students' ability to maintain independent correct responses during small group instruction to progress through a shared story as measured by the task analysis? (P. Mims, personal communication, January 6, 2010).

Permission and Access to the Participants

Prior to conducting this study, the researcher obtained permission to conduct research from the Institutional Review Board (IRB) for The University of Alabama (Appendix C). The researcher obtained consent from system administrators (Appendix D) and school-level administrators within the LEA in which the research was being conducted (Appendix E). The classroom special education teacher sent informed consent to the parents (Appendix F) of each participant. The LEA had access to all consent forms upon request.

In order to maintain confidentiality, the researcher, special education classroom teacher, and other members of the planning team had access to the participants and the data collected. The researcher stored data in a secure area, which was a locked safe in the researcher's home office; the data will be destroyed 1 year after completion of the study. To further ensure confidentiality participants in the study were identified by numbers (e.g., participant 1, participant 2, etc.).

Permission and Access to Nonparticipants

The classroom special education teacher sent an informed consent to the parents (Appendix F) of each of the nonparticipant members of the class. Because identical interventions would be conducted with these students, this was a necessary formality. The parents of all of the nonparticipant members of the study returned the permission forms. A provision to allow for

inadvertent videotaping of the nonparticipant members was included in this form. This provision was included to allow for the contingency of a nonparticipant member of the study unintentionally entering the field of recording.

Research Design

This study employed a single subject design (Kazdin, 1982). According to Kazdin, a *single subject design* is one in which multiple observations are obtained in an attempt to evaluate an intervention's effects on a participant's behavior over a given timeframe. Horner et al. (2005) stated that there are over 70 years of single subject designed experiments to demonstrate the operant principals of behavior. The purpose of single subject research is to demonstrate essential or purposeful relationships between the independent variable (i.e., intervention) and the dependent variable (i.e., participant's responses as measured by the task analysis; Horner et al.).

The small group format used in this study included single subject design for each participant (Horner & Baer, 1978) to examine the effects on each participant's responses on the task analysis during the shared story reading (see Appendix G). External validity addressed the extent to which the research could be generalized into another context (Kazdin, 1982). External validity within the framework of a single subject design was maintained via an operational definition of (a) the participants (further discussion in the participant section of chapter 4), (b) the environmental parameters associated with the study (discussed in the setting section of chapter 4), and (c) the variables employed to alter a participant's responses (i. e., intervention, generalization, maintenance; Horner et al., 2005).

According to Horner et al. (2005) and Kazdin (1982), single subject design can include up to eight participants in a single study. Six participants were selected for inclusion in this

study. More specifically this study was an extension of the Browder, Mims, et al. (2008) study by extending the data collection to small group format, new materials, and maintaining learned skills over time (i.e., generalization and maintenance). During baseline, the researcher read aloud the story in a small group format. A digital video recorder was placed in proximity to the participants to allow the researcher and the classroom teacher the freedom to engage the participants and capture the response emitted by all participants for later analysis. This arrangement was used to enhance participant engagement in the shared story reading and allowed the researcher to score the responses consistently with those associated with the task analysis at a later time.

Upon conclusion of the shared story reading, the researcher reviewed the digital recordings of the session and scored all steps of the task analysis for each participant within the small group. Interobserver reliability was maintained by having the classroom teacher view digital recordings of one third of the data recorded and score participants' independent correct responses on a score sheet (see appendix H). The point-by-point agreement ratio was used for the teacher and researcher's measures of participant behavior (Kazdin, 1982). After an average baseline score had been obtained for each participant within the group, the intervention phase of the research project was initiated.

The researcher conducted team planning meetings to discuss specific strategies (e.g., plan for prompts, props, and devices needed by the participants) to augment the participant's ability during shared story reading. During the intervention phase of this project, the researcher and other team members implemented UDL techniques (e.g., AAC devices, cues for responses) that were appropriate for the participants. The researcher collected data using the task analysis for shared stories (see Appendix G), which consisted of each participant's behavior or response

during shared story reading. The intervention phase was conducted for 6 weeks, 3 times per week, for approximately 30-minute sessions. One session consisted of reading an entire book and targeting all 16 steps of the task analysis. The researcher selected two of three books for inclusion in the shared story reading for each session, but all three books were read by the end of the week. Therefore, all three books selected for inclusion in the study were presented to the participants during at least one session per week. The researcher and other team members provided reinforcement contingencies (i.e., verbal praise, high fives, pats, food rewards, facial expressions, claps, waves, kiss your brain) when the participants correctly responded (i.e., vocalizations, activates voice output device, eye gazes, laughs, smiles, open or wide eyes, raises eyebrows, touches book or objects, lifts head, reaches, verbal response, touches symbol(s), touches white board, posture) during shared story reading. The participants were provided practice when they made incorrect responses or were nonresponsive. Nonparticipant members of the classroom provided or modeled appropriate interactions and responses for participants.

Participants

The classrooms were selected by the school administrators and researcher according to the services provided (i.e., self-contained, partial inclusion) and the students served. The researcher, a doctoral student in special education and a certified special education teacher with 25 years of experience with students with multiple disabilities, served as the primary researcher. Detailed descriptions of participants are critical in the replication of the study and comprehension of the outcome in single subject research designs (Horner et al., 2005). In order to successfully replicate a single subject research design, the description of participants must include all relevant information such as standard demographic information, educational

assessments, diagnosis, and detailed description of the methodology employed to obtain reported results (Horner et al,. 2005; Wolery & Dunlap, 2001). Replication of this study should be easily accomplished secondary to the detailed description provided for each participant.

The planning team included the researcher and special education teacher who were present for all of the meetings. Other professionals were invited to attend on an as needed basis, but in the event scheduling was a problem then additional information was provided when required by the SLP, OT, PT, paraprofessional, and parent. Professional also considered members of the planning team include the principal, general education teacher, and special education administrators.

Participants for this study were students who were enrolled in the local education agency (LEA). Students who previously had been identified to qualify for special education and related services with the eligibility of intellectual disability, developmental delay, or multiple disabilities were considered for inclusion in this study. Eligibility for inclusion in this study was based upon meeting at least one of these criteria: (a) limited to no responsiveness during typical literacy training; (b) previously demonstrated limited or inability to employ AAC device or having no previous exposure to AAC; or (c) nonsymbolic communications (e.g., movement or sounds) or the intentionality of such behaviors are currently not interpretable as identified in the student's IEP.

The participants' records and IEPs were reviewed to confirm that they met the criteria for multiple disabilities, as defined by the Alabama State Department of Education (Morton, 2009) eligibility criteria. The eligibility forms, profile page of the IEP, and the list with related services described on the annual goal pages were used to ascertain information about performance level, psychoeducational assessments, and/or diagnosis in order to ensure that the students were

eligible to participate in this study. The parents of all students who were determined to meet the criteria for inclusion in the study were sent an informed consent form and a cover letter (see Appendix F) describing the parameters of the study. The researcher read the assent form to the study participants (see Appendix F) prior to the baseline phase of the study. The parents of nonstudy participants were sent a cover letter (see Appendix F) and a permission form that would allow them to be videotaped.

The researcher conducted literacy instruction employing shared story reading in a small group format with participants based on the aforementioned criteria. Student participants with a diverse range of abilities interacted in the study. However, all members of the group were not included in the study. Only the data from participants that met the predetermined criteria were used for analysis. For school one, the small group format arrangement consisted of nine students, with three participating in the study. For school two, the small group format consisted of nine students. Two additional resource students were occasionally included in this group on days when their class schedule allowed. All research was conducted in the special education classroom.

Browder, Mims, et al. (2008) indicated that the addition of a speech language pathologist, physical therapist, and family members would have provided useful information for planning the intervention and implementation of strategies for the participants. Therefore, this recommendation was incorporated into the research design for this study. The researcher was able to schedule several team meetings to include speech language pathologists, physical therapists, and occupational therapists. All of the parents of the participants were invited but the majority elected not to participate in the study. The researcher conducted team planning meetings with the professional(s), which included the researcher and classroom special education teacher

for all meetings. Additional professionals (e. g., administrator, SLP, paraprofessional, occupational therapist (OT), physical therapist (PT), and parent) were invited to attend team planning meetings and attended as time and scheduling permitted. These professionals provided information and assisted with planning each participant's adaptation and responses.

Participant 1

Participant 1 was an African American male who was 10 years and 9 months old (see Table 1). This participant had significant disabilities including cerebral palsy resulting in fluctuating spasticity and bi-lateral hip dysplasia, seizure disorder, and esotropia. This participant had a motorized wheelchair fitted with lap belt, H-chest strap, abductor, lateral trunk supports, foot rests with buckle strap (due to resistance), and tray. He had ankle and foot orthotics (AFOs). He used a stander, knee immobilizers, and corner seat. He had recently acquired a hand splint for his right hand to discourage contracture in the wrist and hand.

Participant 1 received physical therapy, speech therapy, and occupational therapy. He also received consultative services with Alabama Institute for the Deaf and Blind (AIDB). He had assistive technology listed as a related service on his IEP. He received all academics in a self-contained classroom for students with significant cognitive and multiple disabilities in his home school. He resided in a local urban area with his parents, an older sibling, and a younger sibling (see Table 2).

Participant 1 took the following medications at home: Depakote for seizure disorder and Albuterol in a nebulizer for breathing difficulties. This participant also had an order for Diastat, which can be administered by a nurse at the school when seizures last longer than 5 minutes. When this medication was administered the participant became extremely lethargic and had to

return home with his parents. According to Participant 1's classroom teacher, he took over-the-counter seasonal allergy medication, which has a tendency to make him "drowsy and/or spacey."

The following information was collected from the eligibility determination form. The Kaufman Assessment Battery for Children-Second Edition (KABC-II) was administered as a measure of intelligence (IQ) during the current school year. Participant 1's standard score on the KABC-II was estimated to be equal to or below 40. This intellectual ability falls within the severe range of mental retardation (APA, 2000). The Battelle Developmental Inventory- Second Edition was also administered to Participant 1 who obtained a standard scored 49. Medical records were used to confirm cerebral palsy and seizure disorder. According to Participant 1's eligibility determination data, he met the ALSDE eligibility criteria for multiple disabilities (Morton, 2009).

Participant 1 had better receptive language skills than expressive. He demonstrated the capacity to understand the majority of what was spoken to him. Participant 1's speech was unintelligible to most people unfamiliar with him or who had not worked closely with him for several years, including the speech teacher. However, Participant 1's speech was intelligible to individuals who had worked closely with him (e.g., teacher, paraprofessionals, and parents). Prior to the intervention phase of the study, Participant 1 was evaluated by Alabama Institute for the Deaf and Blind (AIDB) personnel and it was determined that he was primarily an auditory learner. The classroom teacher indicated that Participant 1 could see enlarged pictures as made obvious by his appropriate responses to probes using the white board. The participant communicated in single words and short phrases, exhibiting the communicative intentions of labeling, repeating, and requesting. He was able to answer some "yes" or "no" questions. He was

unable to see the pictures in the book used for shared story reading but he indicated attention by laughing appropriately and repeating unintelligible words during the reading of the story.

Participant 2

Participant 2 was an African American male who was 6 years and 8 months old (see Table 1). This participant had multiple disabilities including Pervasive Developmental Delay, intellectual disability, and visually impairment. This participant wore glasses secondary to his visual impairment, which appeared to facilitate his ability to view pictures and text. During instructional time, the participant used a Rifton chair with and without a lap belt in an attempt to assist focusing on tasks and activities due to a high level of self-stimulating behaviors.

Participant 2 received physical therapy, speech therapy, and occupational therapy within the school environment. He had assistive technology listed as a related service on his IEP. He received all academic instruction in a self-contained classroom for students with significant cognitive and multiple disabilities within a school located in his home cluster. He resided in a local urban area with adoptive parents and an older brother. Participant 2's older brother received his academic instruction in the same special education classroom. This participant did not receive any prescription medication during the time of the study (see Table 2).

The following information was collected from the eligibility determination form. The Battelle Developmental Inventory-Second Edition was administered as a measure of intellectual and developmental abilities. Participant 2's standard score on the Battelle was a 46. A local physician's clinical medical notes indicated that Participant 2 had a diagnosis of Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS) with provisional Autism (Psychiatric-Autism). The Gilliam Autism Rating Scale-Second Edition (GARS2) also was

administered and indicated that a diagnosis of Autism was likely. Participant 2 met the ALSDE eligibility criteria for multiple disabilities (Morton, 2009).

Participant 2 could use one or two word utterances, but typically communicated by pointing or grabbing at desired items. He made self-stimulating growls and sounds. He was in the initial phase of repeating words spoken by the teacher during the time of this study. Participant 2 was extremely active and required redirection to remain focused on a specific task. He required an adult in close proximity in order to remain seated and on task.

Participant 3

Participant 3 was a Caucasian male who was 10 years, and 10 months old (see Table 1). This participant had a diagnosis of multiple disabilities including Autism, hypophosphotasia skeletal disease, and severe allergies. Prior to and during the study, participant three exhibited self-stimulating behaviors but would stop when given a command by the teacher or paraprofessional.

Participant 3 received speech therapy twice per week in a group setting. He had assistive technology listed as a related service on his IEP. He received all academic instruction in a self-contained classroom for students with significant cognitive and multiple disabilities in his home school. He resided in a local urban area with both parents and a grandparent. The participant visited a physician to receive allergy shots once per month; otherwise, this participant received no prescription medications at home or at school (see Table 2).

The following information was collected from the eligibility determination form. The Reynolds Intellectual Assessment Scale (RIAS) was administered as a measure of IQ last year. He obtained an estimated standard score to be equal to or less than 40. This score falls within the

range of severe mental retardation. The Battelle Developmental Inventory was administered to this participant and a standard score of 49 was obtained. The Autism Diagnostic Observation Schedule- Module One (ADOS) was administered, which indicated that this participant met the criteria for Autism Spectrum Disorder. Participant 3 met the ALSDE eligibility criteria for multiple disabilities (Morton, 2009).

Participant 3 exhibited echolalic speech, which hindered assessment of expressive language. He was significantly delayed in both expressive and receptive language skills. He responded verbally with “no” to indicate a negative and he repeated words in sentence, usually the last word, to indicate yes. He followed directions when given by a familiar person; therefore, the researcher had to establish rapport with the participant in order to facilitate interaction.

Participant 4

Participant 4 was an African American male who was 6 years and 9 months old (see Table 1). This participant met the ALSDE eligibility criteria for multiple disabilities, which included Autism and speech delays. According to the participant’s IEP, he had a habitual open mouth posture, reduced articulator movement, and excessive salvia, all of which contribute to reduced intelligibility, especially for individuals who were unfamiliar with him.

He received all academic instruction in a self-contained classroom for students with significant cognitive and multiple disabilities in his home school. He received speech therapy twice per week in a group setting and occupational therapy daily. His IEP had assistive technology listed as a related service. Participant 4 resided in a local urban area with his mother. According to Participant 4’s mother he received allergy medicines and medications to reduce his saliva production at home. However, the mother was unable to provide the names of these

medications. Participant 4's mother and his teacher indicated that the saliva reduction medication appeared to have little impact on the production of excessive saliva (see Table 2).

The following information was collected from the eligibility determination form. The Developmental Assessment of Young Children (DAYC) was administered as a measure of the participant's developmental level. Participant 4's standard score was 50 on the DYAC. This participant obtained a standard score of 50 on the Battelle Development Inventory. The GARS was administered and indicated that the presence of an Autism Spectrum Disorder was likely. The ADOS-Module One was administered by a local practitioner, which yielded a diagnosis of Autism Spectrum Disorder. Participant 4 met the ALSDE eligibility criteria for multiple disabilities (Morton, 2009).

Participant 4 typically communicated by physically directing adults to a desired object and employed limited vocabulary (i.e., single words) when prompted. Participant 4 had the capacity to repeat familiar or routine phrases but typically did not use these phrases independently. Although he was beginning to use a limited number of phrases to respond to questions that were presented regularly during classroom activities.

Participant 5

Participant 5 was a Caucasian male who was 11 years and 9 months old (see Table 1). According to school records, this participant had multiple disabilities including cerebral palsy, cortical blindness, and myclonic seizures. Participant 5 used a wheelchair with neck supports, chest straps, lateral trunk supports, and footrest with Velcro straps. He also had knee immobilizers, ankle and foot orthotics, gait trainer, and wedges.

Participant 5 received all academic instruction in a self-contained classroom for students with significant cognitive and multiple disabilities in his home school. He resided in a local urban area with both parents and a younger sister. He received physical therapy, speech therapy, occupational therapy, and nursing or medical services due to a gastrostomy feeding tube. He had assistive technology listed as a related service on his IEP. The Alabama Institute for the Deaf and Blind provided additional services for Participant 5, which included an evaluation to determine whether he had the capacity to see colors. According to school records, Participant 5 took Kepra for seizure disorder and Baclofen to relax muscle tone at home. According to the classroom teacher, no negative side effects that interfere with academic performance were noted secondary to the medications. Participant 5 was fed via a gastrointestinal tube at home by his parents and by a nurse at school (see Table 2).

The following information was collected from the eligibility determination form. Participant 5 obtained a standard score of 41 on the ABAS-II from his teacher and a standard score of 40 on the parent form. Medical records on the eligibility determination form were used to confirm the diagnoses of cerebral palsy, seizures disorder, and vision impairment. Participant 5 meet the ALSDE eligibility criteria for multiple disabilities (Morton, 2009).

Participant 5 was considered nonverbal (i.e., has a zero word vocabulary) but had the capacity to communicate using a BigMac voice output device with prerecorded responses. Communication was accomplished by auditory scanning of responses with 2-second pauses between choices then activating the BigMac to make his selection. Participant 5 also was able to communicate with facial expressions and head movement (e.g., smiled to make a selection or affirmation, turned head to demonstrate response to probes).

Participant 6

Participant 6 was an African American female who was 6 years and 4 months old (see Table 1). According to her eligibility determination form, she met the ALSDE criteria for multiple disabilities including Down syndrome, visual impairment, Atrioventricular node (AV node) heart valve defect, and developmentally delayed. Participant 6's low muscle tone has affected her balance and gait.

Participant 6 received physical therapy, speech therapy, and occupational therapy as a related service. She had assistive technology listed as a related service on her IEP. Participant 6 received all academic instruction in a self-contained classroom for students with significant cognitive and multiple disabilities within a school in her home cluster. She resided in a local urban area with her mother. Participant 6 received no prescription medication at school (see Table 2).

The following information was collected from the eligibility determination form. Participant 6 obtained a standard score of 46 on the Battelle Developmental Inventory. The Developmental Assessment of Young Children was administered, on which a standard score of 49 was obtained. Medical records obtained in the student's school records were used to confirm the diagnosis of Down syndrome, vision impairment, and AV heart defect. Participant 6 meet the ALSDE eligibility criteria for multiple disabilities (Morton, 2009).

Participant 6 was considered nonverbal with a 3- to 5-word vocabulary, which was easily understandable by an unfamiliar observer. The use of picture symbols had been questionable due to Participant 6's vision problems and her desire to grab all object/symbols presented with both hands (i.e., does not make a selection). She appeared to have some receptive language as demonstrated by following through with a specified task. Her balance and gait were unstable

which interfered with her ability to remain balanced in her seat when leaning forward to activate an AAC device, especially when excited.

Table 1

Demographic Data-Participants with Multiple Disabilities

Demographic	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6
Age	10.9	6.8	10.10	6.9	11.9	6.4
Gender	Male	Male	Male	Male	Male	Female
Race	African American	African American	Caucasian	African American	Caucasian	African American

Table 2

Participant Data

Other Data	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6
Home school	yes	no	yes	yes	yes	no
Adaptive equipment	yes	yes	no	no	yes	no
Therapies	PT OT SP	OT SP	SP	SP	PT OT SP	SP
AIDB Services	yes	no	no	no	yes	no
Siblings	yes	no	yes	no	yes	no
Prescriptions	yes	no	yes	yes	yes	no

Settings

The setting for this study was self-contained classrooms in the LEA. The specific classrooms used in the study were selected by the school administrators and researcher according to the services provided (i.e., self-contained, partial inclusion) and the students' demographics (i.e., multiple disabilities, nonverbal, elementary students). The research was conducted within the context of the students' classroom using familiar materials. Therefore, direct observations

were conducted in the natural setting in which the participants normally function. According to Kazdin (1982), this form of observation is more likely to reflect an accurate representation of the participants' present level of academic achievement and functional performance.

The teacher in the classroom at school one had completed a Master's degree in Special Education and had been teaching for 23 years. This classroom had 2 paraeducators, one female with 16 years of experience and one male with one semester of experience. The classroom consisted of nine students, all of whom had met the ALSDE eligibility criteria for special education and related services. Participants 1, 2, and 3 were assigned to school one. The classroom was divided into four quadrants. Quadrant one contained the changing area, a computer center with three computers, and a reading center with a circular table. Quadrant two contained a toy center, a motor work activity area with adaptive equipment (e.g., mat, stander, corner chair, etc.), two rectangular tables positioned perpendicular for large group work, and a sink area. Quadrant three contained the teacher's desk, work computer, and the morning circle area with a white board, Elmo projector with a Mimio Teach Interactive System. Quadrant four contained a horseshoe table conducive for independent and small group work. Each area had a shelf or cabinet with related materials (see Figure 1).

School one was one of 13 elementary schools within the local city school district that served more than 10,000 students. School one housed approximately 498 students, of which 76% received free or reduced lunch. School one was over 99% African American and was considered a Title I school.

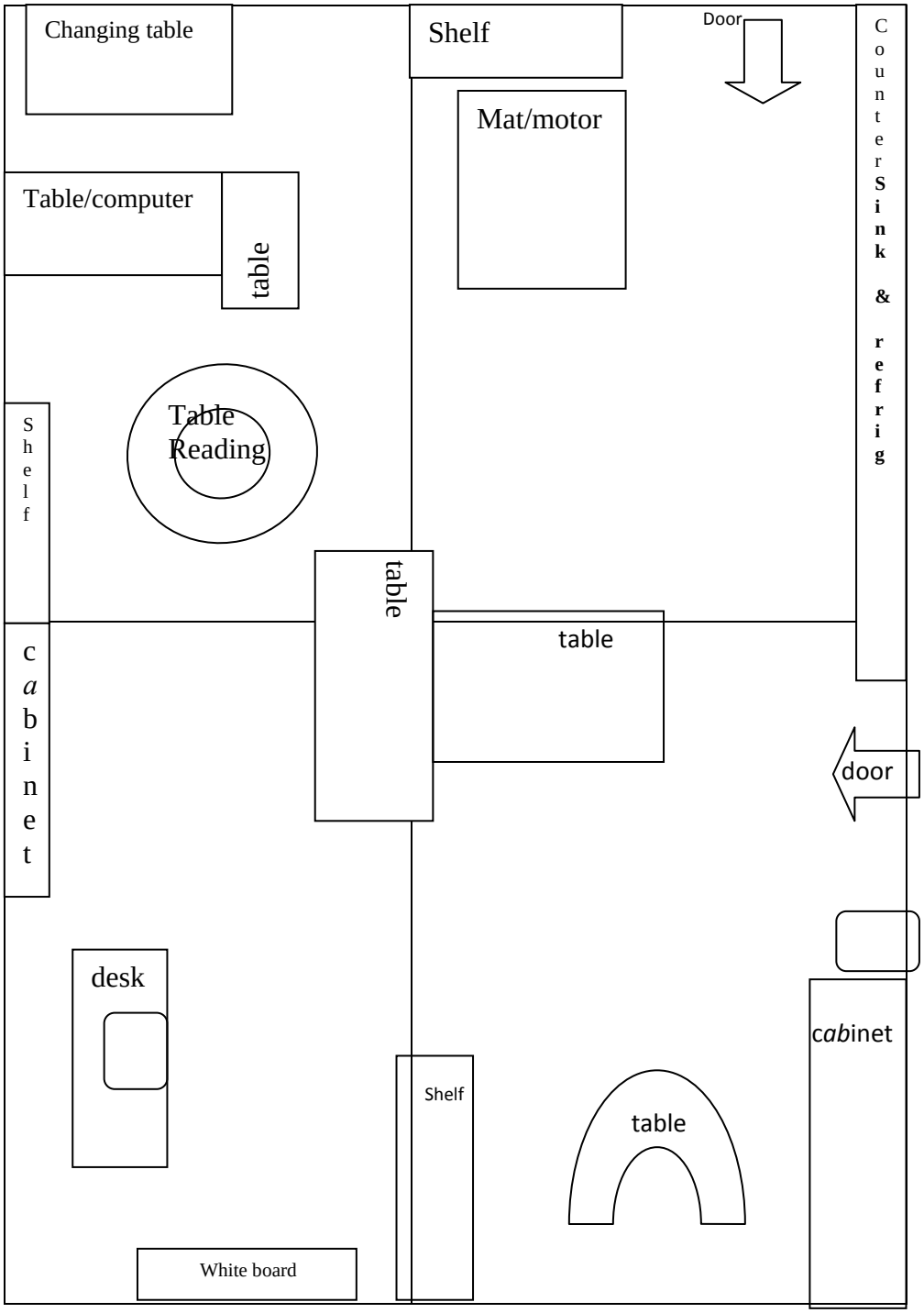

Figure 1. School one's classroom layout.

The teacher at school two had completed a Master's degree in Special Education and had over 8 years of teaching experience. The classroom had two paraeducators, both of whom were female and each of whom had over 5 years of experience. The population of this classroom consisted of nine full-time students and two students who attended the class as a resource. Participants 4, 5, and 6 were assigned to school number two. None of the resource students were included as participants in this study.

This room was also divided in quadrants. Quadrant one contained a kidney shaped table that was used for small group work and a circle time area with an easel and manipulatives. Quadrant two contained a rectangular table used for small group work. Quadrant three contained the teacher's desk with a work computer, filing cabinets, one student computer located beside the teacher's desk, and a circular table for small group instruction. Quadrant four contained a low table for changing and motor work as well as an open floor area with equipment (e.g., wedges, gate trainers, etc.) for motor work. Adjacent to the first and fourth quadrant of the room was a wall with counters housing a refrigerator and sink area. Behind this wall is a hall that contains lockers and bathroom. Each quadrant had shelves or cabinets with related materials (see Figure 2).

School two was one of the 13 elementary school within the local city school district that served more than 10,000 students. School two housed approximately 556 students with 41% receiving free or reduced lunch. School two was approximately 80% African American and 20% Caucasian.

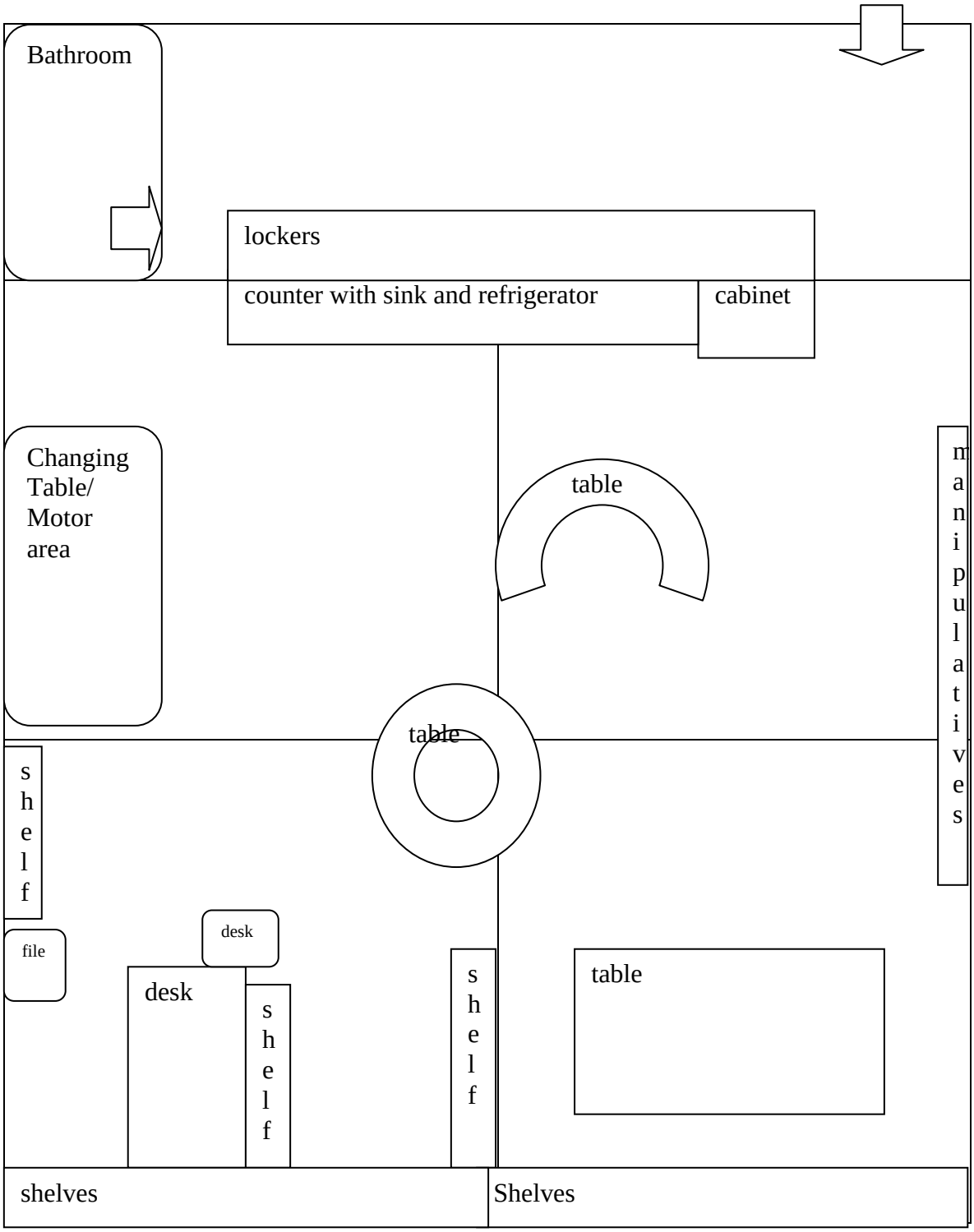

Figure 2. School two's classroom layout.

During the study the participants were positioned in a semi-circle in the area of the classroom that was typically used for group activities. The researcher was positioned in the front of the small group so that the digital camera could maintain primary focus on the participants. The researcher provided the primary intervention while the other professionals (i.e., SLP, OT, PT, classroom special education teacher, paraprofessionals, and other available professionals) provided support for interaction with materials presented during shared story reading. The materials used for this project consisted of Big Book, storyboard, and adaptive book. As discussed by the planning team, various AAC techniques and devices were used for this study (i.e., communication boards, sentence strips with picture symbols, individual picture symbols, black and white pictures, objects related to the story, sounds related to the story, textures related to the story, BigMac, CommuniBuilder, SuperTalker, Tech Talk Communication Builder, Progressive Communicator, Mimio Teach Interactive System with digital projector, Vestibular stimulation exercises, weighted lap blanket, air pillow, bear hug vest, solid and clear trays, Rifton chair, stools, small boxes, towel).

The participants and other members of the class participated in three sessions of shared story reading per week, each lasting approximately 30 minutes. The researcher collected data on all study participants. All students who participated in the shared story reading were provided adaption and or access to AAC as needed or desired. The researcher as well as other professionals in the classroom interacted with all of the students included in the study (i.e., participant and nonparticipant members).

Independent Variables

The researcher provided the intervention, which was the independent variable that controlled verbal and nonverbal behavior. This included UDL techniques, which were AAC

devices, picture symbols, objects, and intraverbal training. Verbal praise and other positive behavioral supports (i.e., high fives, clap, pats, food rewards, verbal praise, facial expressions, kiss your brain) were incorporated into the study to facilitate participants' independent correct responses to questions or probes on the task analysis for shared stories. Research has indicated that positive behavioral supports can be employed by a researcher during an intervention to augment participants' interaction (Browder, Gibbs et al., 2009; Michael & Sundberg, 2001; Skinner, 1957).

Dependent Variables

The dependent variable for this study was the behavior or response that counted as correct independent responses produced by the participants that were consistent with the 16-step task analysis. Task analytic instruction was novel instruction in the 1970s, but became common practice in the 1980s, and continues to have a place in educational practices today (Browder, Trela, & Jimenez, 2007; Haring & Kennedy, 1988). The task analysis in this study consisted of 16 steps (see Appendix A) that demonstrated strategies to facilitate the ability of participants with severe and multiple disabilities to engage in literacy instruction using shared stories. Each step was based on identifiable, observable behaviors that the participant had the capacity of producing independently, as determined by team consensus (see Appendix B).

Procedures

During the initial phase of the study, the researcher taught the literacy lessons by reading three books that were chosen for the intervention to determine the baseline for each of the participants. The books were selected due to their ease of adaptation of main character, repeated

storyline, and surprise element (London, 1992; Pett & Rubinstein, 2011; Voirst, 1972). The researcher established rapport with the professionals and participants in the classroom via personal interaction. The participants were positioned in a semi-circle for literacy instruction, which the researcher presented in the form of shared story reading. The baseline phase consisted of 7 to 10 days for school one and 13 to 16 days for school two. The number of baseline sessions varied for each school due to participants' absences and weather days. The baseline reaction of each participant was obtained during the initial phase of shared story reading. The same books were read for baseline, intervention, and maintenance. During baseline, the researcher read the books and followed the steps of the task analysis but did not provide positive feedback or practice of correct responses. The other professionals in the room did not provide any assistance during the baseline phase.

The criterion for not meeting successful standards during baseline was equal to or less than 25% of the possible number of independent correct responses (i.e., 16), which was equal to 4 or less independent correct responses on the task analysis. Three participants at each school were determined as eligible for inclusion in the study. The participants chosen for inclusion in the study all scored at or below the 25% on the task analysis.

The UDL techniques and components used by the planning team provided strategies to facilitate participants' successful interaction during shared story reading (Browder, Gibbs, et al. 2009). Skinner's (1957) ABC model, stated that consequences consisted of positive feedback from the professionals, which was implemented in this study to increase the participants' responses to the literacy lesson. Consistent with Vygotsky's (1993) zone of proximal development, techniques (i.e., modeling, practicing) were implemented to increase the participants' potential to actively interact with the lesson, respond independently, and correctly.

Alberto et al. (2007) indicated that when individuals have a mode to communicate (i.e., AAC) they experience the environment in a more phenomenological and productive manner. The implementation of AAC allowed the participants to interact and provide independent correct responses.

The professionals involved in all of the team planning meetings consisted of the researcher and the special education teacher. Other professionals (e.g., SLP, general educators, physical therapist, occupational therapist, and librarian) were included in the team meetings, as allowed by their schedules. Input, which benefited team planning, was obtained from team members unable to attend specific meetings (Cooper-Duffy, Szedia, & Hyer, 2010). The team met to evaluate the individual needs, as related to each book and step in the task analysis using the UDL components (i.e., representation, expression, and engagement). Throughout the entire shared story reading, the researcher and other professionals facilitated participant engagement by prompting, providing specific praise, or guiding the participant through the correct response.

The researcher conducted the planning meeting prior to the intervention (e.g., reading of the shared story with adaptations), in order to discuss the task analysis for each book and discuss methods to individualize the task for each student. The researcher and other professionals met in the special education setting to create the necessary adaptations and discussed the availability of AAC devices. The classroom teachers provided the information pertaining to the appropriate AT devices listed in the participants' IEP supplemental aids and services section. These adaptations served to increase each participant's interactions and responses.

Browder, Mims, et al. (2008) indicated that obtaining AAC devices after the planning team met was a problem in their study because they were unable to obtain the devices in a timely manner to allow for the devices to benefit participants. Browder, Mims, et al. made the

recommendation for future research to procure the necessary AAC equipment prior to implementation of the intervention. In this study, the researcher followed the recommendation of Browder, Mims, et al. and obtained all available AAC devices from both classrooms and other school system resources prior to implementing the intervention.

Research indicates that collaboration (e.g., team planning meetings) among professionals working with participants with severe disabilities has been effective in establishing what participant supports are needed to benefit each participant (Hunt, Soto, Maier, Liboiron, & Bae, 2004). The meetings were held during optimal times (e.g., planning period, the first part of the week, the last day of the week) in order to allow ample time to make adaptive materials (e.g., print communication boards, design individual symbols, program voice output devices, locate the objects that were depicted within the book). Additional meetings were conducted after the intervention phase to adjust adaptation or add modifications.

For the purposes of this study, the essential materials were three picture books with ease of adaption, characters that could be renamed, repeated storylines, and a surprise element located within the book or that could be added. The books needed to contain items that actual objects could be collected for participants to focus on and use to answer questions. A librarian, SLP, and general education teacher provided input for the book selection with the researcher and teacher making the final book selections. These books were adapted in the following manner: (a) the main character renamed with the participants' name(s); (b) the addition of a surprise element relating to the story; and (c) a repeating storyline (Browder, Mims, et al., 2008). Materials and equipment that were used to create items needed for the story were Mayer-Johnson BoardMaker (2003), which, in conjunction with the 2004 addendum programs had over 7,000 picture symbols, and a portable laminator. The program was utilized to create storyboards (i.e., poster

boards with storylines and characters depicted with various sizes of picture symbols, which participants could manipulate), communication boards, individual symbols, and sentence strips. In this study the laminator and 5, 10, or 15 millimeter lamination was used with to increase the longevity of symbols, ease of manipulation (i.e., placement in voice output devices), and durability of the symbols. At additional team planning meetings more items were included to increase participants' independent responses.

The researcher and/or other professionals who attended the meeting made notes on the UDL components questions with task analysis (see Appendix B). Each step of the task analysis was reviewed with the UDL components (i.e., representation, expression, and engagement). The team discussed each participant's baseline responses and determined the adaptations needed to increase the participant's responses. Each component was paired with the same question utilized in the study by Browder, Mims, et al. (2008) and presented to the team members in order to make appropriate modifications and adaptations to facilitate student participation and engagement.

For the first step, representation, the question was "Is there a better way to present this step?" Skinner's (1957) ABC model indicated that antecedents (e.g., books) are presented in a way that facilitates the participants' response (e.g., to choose a book). Vygotsky (1993) stated that differentiating the environment (e.g., presenting books on a White Board) is the only manner in which students with disabilities could demonstrate their full potential. This study employed numerous techniques to represent the materials in a manner to facilitate learning by the participants.

In step two, expression, the question was "Is there an alternative way the student could more easily make the response?" Vygotsky indicated that special education has a responsibility

to focus on the quality and quantity of communication within the school culture and curriculum. This study incorporated modifications that allowed the participants to demonstrate that they understood the probes as well as the story presented on a given day. Skinner (1957) described language behavior (i.e., nonverbal and verbal responses) as operates, which are related to contingencies presented within the environment of both the speaker and the listener (Sundberg & Partington, 1998). Therefore, contingencies such as positive reinforcement were incorporated into the research design of this study.

For the third step, engagement, the questions were "How can the response be prompted so the student learns the desired response? How can the prompt be faded so the student responds without teacher assistance? Are there other ways to get the student actively engaged?" (Browder, Mims, et al., 2008). Engaging the participants in the story relates to Vygotsky's zone of proximal development by presenting cues and supports that are appropriate for each individual. Language behavior is initially produced by stimuli that is manipulated within the individual's environment and maintained secondary to specific contingencies, which are presented by the teacher, researcher, etc. (Skinner, 1957).

Each step of the task analysis was reviewed with each component of UDL and for each participant in order to augment individualized responses. The planning team used the UDL components with task analysis (see Appendix B) to depict the modifications and adaptations made for each participant. Participants' ability to engage or interact varied; therefore, the adaptations and devices were adjusted to meet their cognitive and physical abilities (Browder, Wakeman, et al., 2007; Browder, Flowers, & Wakeman, 2008). Each professional was aware of participant expectations and adult responsibilities to enhance participant interaction during shared story reading.

The intervention strategies and approaches for the study included a variety of techniques; UDL components were incorporated with intraverbal training (e.g., ask questions while presenting props, ask questions in a variety of ways), AAC techniques (e.g., use of white board, black and white book covers, placement of devices and communication boards; CAST, 2010; Light, 1997; Light & Kent-Walsh, 2003; Skinner, 1957), and scaffolding skills (e.g., modeling, type of object; Bellon-Harn & Harn, 2008; Liboiron & Soto, 2000; Vygotsky, 1993) . The use of shared story reading encompassed the context of providing participants with an avenue to engage in effective communication that can be employed in various social and academic settings (Bedrosian, 1999; Kent-Walsh & McNaughton, 2005; Light & Kent-Walsh). Researcher, teachers, and other significant personnel who typically interact with the participant controlled access to the devices, materials, and degree of literacy exposure (Light & Kent-Walsh). This allowed presentation of devices and materials in convenient placement for individuals who have physical issues (e. g., wheelchair, size), which facilitated reading for these individuals. Research indicated that participants who interact with an audience on a regular basis become more competent or are able to generalize communication interactions within multiple environments (Light, Binger, Agate, & Ramsay, 1999; Light & Kent-Walsh; Skinner; Sundberg & Partington, 1998). Participation in small group instruction fosters positive interaction and self-confidence (Bellon-Harn & Harn, 2008).

Preparation for the intervention included a myriad of duties (e.g., ensuring that devices have batteries, picture symbols are created for individual symbols and communication boards, symbols are laminated, tables, stools, or boxes are attained for placement AAC devices). The researcher employed a digital video recorder to detect when a particular response had occurred, the duration of the response, or other features of performance (Kazdin, 1982). The researcher

used a digital video recording of the intervention sessions to record the participants' responses due to the limited intellectual capacity, verbal behavior (e.g., nonverbal less than 100 word vocabulary), and group interactions occurring simultaneously. In addition, a digital recording allows the opportunity to review the session at a later time in order to obtain more accurate scoring of responses and increase interobserver reliability. The researcher set a digital video recorder in proximity to face the participants in order to record their verbal, nonverbal, and behavioral responses to the probes during shared story reading, using all steps of the task analysis.

Each lesson consisted of the researcher reading one adapted book and the participants responding to the researcher's probes such as step one: "What book would you like to read?, as the researcher held up two books that have been adapted for the literacy lesson for the small group instruction. The participants responded by verbalizations, activation of voice output device, eye gaze, touching the book (i.e., slapping, grabbing, pointing, reaching, Mimio Interactive Pen), or in a manner that the particular participant's planning team discussed as an appropriate response. If the participant response was elicited with or without prompting (e.g., pen light shone on correct response, proximal placement of a book), then the researcher employed verbal praise associated with the task. In the event the participant did not respond to the selection process, no praise was given and the researcher said, "I am unsure which book you want to read so I will make a choice for you." Each step included a request by the researcher and a response from the participant.

The researcher indicated which book was selected by the participant(s) and this book was used for literacy instruction. The researcher held the book upright and read the cover of the book (i.e., title, author). Depending on the functional level of the participants in the group, this step

had to be repeated to get the participants to attend to the book cover (i.e., attend). The response could be verbal, activation of voice output device, eye gaze, or touching the book (e.g., slapping, grabbing, pointing, and reaching). The researcher and other professionals had materials or objects that were representative of the book's theme preselected during the planning session. The researcher discussed the objects associated with the story while in proximity to each participant, in order to attain focused attention. The response to each object could be verbal, activation of voice output device, eye gaze held for at least 2 seconds, or touching the object (e.g., reaching, slapping, grabbing, pointing, reaching).

The first intraverbal question was related to the prediction, "What do you think this story is about?", while two objects were presented, one representing the story theme and the other not associated with the story. The participant could attend to the object by responding verbally, activation of voice output device, eye gazing, or touching the object (e.g., slapping, grabbing, pointing, and reaching). In the event the participants did not respond, predetermined prompts were employed (e.g., pen light, proximity, repeat probe, etc.). Verbal praise was presented to participants who provided correct responses, with or without prompts. After the participants were provided with an opportunity to respond, the nonstudy participants were asked the same question and given an opportunity to respond. Thus began the actor portion of the researcher instructional process.

During this stage of the intervention, the researcher initiated reading the book enthusiastically and energetically. According to Tomlinson (2002), learning becomes easier for a child when the teacher makes the content inviting. One modification to the story was that each participant's name replaced the name of the character in the story. In an effort to elicit a reaction from each participant this process was be repeated for each participant. The responses varied for

each participant, but targeted responses consisted of a head turn or lift, clap, laugh, smile, wide or open eyes, activation of voice output device, verbalization, or using communication board. This step was not presented to the nonstudy participants. After the response was produced by the participants, the researcher continued to read the story aloud.

In order to facilitate attention/focus for the participants, the researcher presented the object to the participants individually. The participants' response could be verbal, activation of voice output device, eye gaze, or touching the object (e.g., slapping, grabbing, pointing, and reaching for the object). The repeated storyline portion was programmed into the voice output devices (e.g., Dynavox, CheapTalk, BigMac, 7 level Communication Builder, Techtalk, Super Talker); sentence strip and individual symbols were created prior to literacy instruction. When the page was read that depicted the repeated storyline, the participants interacted by completing the phrase or line. The response was activation of voice output devices (e.g., Dynavox, CheapTalk, and BigMac), attempted to pick up or touch the correct individual symbol, touched correct picture symbol on the communication board, and/or verbalized word or phrase. The timeframe was amended to allow ample opportunity for each participant to respond; however, if there was no movement toward a device it was counted as a nonresponse. In the event of a nonresponse, the researcher requested that one of the professionals providing support assist the participant. The nonstudy participants modeled this step of the task analysis for the participants; interestingly, some of the nonstudy participants even elected to use the AAC devices. This was recorded as a nonresponse when scoring the task analysis of shared stories. The repeated storyline was presented for at least three pages in the book for each participant to respond. This step was representative of intraverbal training.

In order to complete this intervention, the researcher continued to read the story and, during an appropriate spot in the story, presented a surprise element (e.g., dropped book for loud noise, pop water balloon) in order to get a reaction from the participants. The responses varied for each participant, but acceptable responses could be head turn or lift, clap, laugh, smile, wide or open eyes, scream, or verbalization. After the story was completed, the researcher presented the two objects from the prediction portion (i.e., intraverbal training) of the task analysis to the participants and asked, “What was this story about?” The participants had the opportunity to select the correct object via vocalizations, activation of voice output device, eye gaze, or touching one object (e.g., slapping, grabbing, pointing, reaching for the object). The nonstudy participants had the opportunity to interact with the story by modeling for participants.

During the last step of the task analysis, the researcher asked each participant another intraverbal training question, “Do you want to read the story again?” The researcher displayed yes/no symbols individually, on a communication board (e.g., enlarged, color coded, tactilely elevated with puffy paint), and auditory scanning in proximity to one participant to elicit a response. The responses could be vocalizations, eye gazing of one symbol, or touching one symbol (e.g., slapping, grabbing, pointing, and reaching). If a particular participant indicated “yes,” then the process was repeated by the researcher, the teacher reading the story, or a DVD/compact disc previously recorded version of the story could be viewed or listened to on. If a participant indicated “no,” then they were allowed to continue the literacy instruction with a different task that the teacher had planned.

The 16 steps in the task analysis were presented to each participant, however, the nonstudy participants were presented with a maximum of 12 steps (i.e., not presented with choose a book, or name embedded within the story). The individual participants were involved in

direct question/answer procedures for at least 5-10 minutes per story. The lessons were presented three times a week for 6 weeks for intervention, 1 week for generalization, and 2 weeks for maintenance.

Baseline

Baseline observations were employed to predict the types of behavior that would likely continue to transpire in the event specific interventions were not introduced into the environment. The researcher gained insight into the limitations of the participants' behavior being elicited by gathering baseline data of specific target behaviors prior to intervention (Kazdin, 1982). Data pertaining to baseline behaviors provide a benchmark to compare with the intervention phase (Horner et al., 2005). Rapport with the participants began at this time. For the purposes of this study, three books were identified based on the current literature being addressed in the elementary schools and team choice. In accordance with Browder, Mims, Spooner, Ahlgrim-Delzell, and Lee (2008), the team determined adaptations to the books that were appropriate for each participant. Three predetermined books were used to ascertain both the baseline response patterns of each participant as well as for intervention and maintenance. The book represented during generalization was a novel book.

The researcher allowed the participants the opportunity to select the book from a choice of two books for the literacy activity (i.e., step one on the task analysis; see Appendix A). When all of the participants had indicated their choice, the researcher read the book chosen by the majority of the participants. In the event the participant was unwilling to make a selection or the response of the participant was incoherent, the researcher informed the participant that the choice was unclear; therefore, in this particular instance, the researcher made the selection. If by chance

one participant's book was in the minority, that book was read during the next literacy lesson.

During the baseline session, the researcher presented no reinforcement or cues while reading the book. The researcher read the book enthusiastically while giving the participant the opportunity to perform the steps on the task analysis (see Appendix A). The researcher circled the type of responses made to each step on the task analysis checklist as soon as the digital video recording of the session was reviewed. Because the researcher's dialogue was digitally video recorded, this served to identify specific participant responses (e.g., yes, Participant 1 smiled at the object, Participant 2 reached for a certain symbol) for later analysis. The baseline phase of this study was conducted in ample time allowing the participants to present a trend in behavior. Baseline data were collected for 7 to 10 days at school one and 13 to 16 days at school two, which is considered an acceptable amount of days, according to Horner et al. (2005). Kazdin (1982) stated that five data points are sufficient to ascertain the participants' present level of functioning. After the video sessions were scored, the results were presented at the team planning meeting. Team meetings were conducted after the baseline data were collected.

Team Planning Meeting

Team planning meetings were held in the classroom after the baseline data were collected and prior to implementation of intervention to discuss the appropriateness of the devices, symbols, and adaptations in order to facilitate participants' interaction and engagement with the literacy lesson. The researcher conducted team planning meetings in order to discuss the implementation of each storybook. Follow-up team planning meetings were scheduled on an as needed basis to ensure the fidelity of the intervention strategies. Operant conditioning was incorporated into the study due to the fact that it fits neatly within the UDL concept by allowing

the environment to be manipulated in a manner that facilitates success for students with severe and multiple disabilities (CAST, 2010; Michael & Trazek, 2006; Wehmeyer, 2006).

The planning team included the researcher and special education classroom teacher for all of the meetings. Other professionals were invited to attend on an as needed basis, but in the event that scheduling was a problem, then additional information was provided as required by the SLP, OT, PT, paraprofessional, and parent to plan each participant's adaptations. Other professionals who could have attended the meetings were the principal, general education teacher, and special education administrators. The SLP shared knowledge about the availability of AAC devices as well as objects relating to the stories. The occupational therapist provided strategies for the participants that had occupation therapy as a related service on their IEP. The physical therapist assisted with positioning ideas for the devices and positioning of body for the participants with PT as a related service. The paraprofessionals provided suggestions about size of symbols, placement of devices, and auditory scanning. A calendar of meeting dates and times were sent home to the parents. The parent(s) were provided with the opportunity to share suggestions about what their child enjoyed, such as sounds, smells or touches, to encourage increased interaction. The other professional(s), who may participate in the team planning meetings, offered general suggestions or location of devices at other schools that could be borrowed or transferred for use during the intervention. A special education administrator attended one meeting and one literacy lesson during this study.

The steps in the task analysis were discussed in relation to each participant. The UDL components questions with task analysis were utilized to ensure that each step of the task analysis was addressed with all components (see Appendix B). The participants' responses to

each step on the task analysis for shared story reading were listed on a score sheet for easy access for the researcher and teacher when reviewing digital recorded sessions (see Appendix H).

The researcher, classroom teacher, and/or the paraeducators (e.g., part of the UDL team) shared the responsibility of recording the text into an AAC voice output device, creating and printing individual picture symbols, and communication boards, which were appropriate to meet the individual needs of each participant and member of the literacy group. Objects relating to each book were obtained by the researcher or teacher. All preparations were completed prior to the intervention phase for each story.

Intervention

The function of the intervention stage was to ascertain whether the behavior observed in the baseline phase had been altered as the result of the modifications implemented during the intervention. This task was accomplished by affording the researcher with the opportunity to visually inspect data points via comparison to test whether performance during the intervention phase actually departed from projections made during baseline (Kazdin, 1982). During the intervention phase of this study, training of appropriate responses were conducted using modeling, verbal praise and/or prompting in response to each step of the task analysis, which Skinner (1957) referred to as educational reinforcers (Frost & Bondy, 2006). Intraverbal training consisted of interventions that also could be used for fill-in-the-blank items on storyboards of familiar stories and the use of actual objects to answer questions. The literacy instruction consisted of a specialized environment (e.g., AAC, positioning equipment) and staff that were previously trained to assist the researcher and or teacher. Vygotsky (1993) indicated that a

special education program should consist of a specialized environment and staff trained to address the individualized strengths of the student (Gindis, 1995).

Acceptable responses could be pointing, labeling, reaching, and eye gazing toward a picture or an actual object related to the story. The researcher and other professionals provided verbal praise, cues, and prompting specific for each task the participants performed, which was recorded for later analysis. In the event the participant did not make any response, the researcher or other professionals employed the least intrusive prompt to facilitate a correct response on the part of the participant. Additional prompting was implemented as needed to encourage correct responses (Browder, Mims, et al., 2008).

The participant response was counted correct if an attempt was made to activate the device but not enough pressure was applied to activate the device. If no response was made to activate the device, then the researcher asked the participant to “show me with your talker.” In the event the participant still did respond to the probes (i.e., makes no attempt to activate the device) the professional modeled and/ or guided the participant’s hand to activate the device with adequate pressure; this was counted as a nonresponse, but provided an opportunity for the participant to practice a correct response (Browder, Mims, et al., 2008). The nonstudy participants modeled independent correct responses by activating devices and responding verbally. In the event they were necessary, supports were provided for picture symbols and communication boards. Two common supports that were employed to facilitate this process were light cue and proximity of the picture symbol (Browder, Mims, et al.). To encourage participant responses verbal cues such as, “show me”, “pick one”, repeating the first part of the repeated storyline or question, and/or modeling activating a device were employed.

This study extended the Browder, Mims, et al. (2008) study, in that it used a small group format, new materials, and collected data over time. For this study, which was an extension of the Browder, Mims, et al. study, the intervention phase was conducted three times a week for approximately 30 minutes for 6 weeks. Presenting the intervention three times a week allowed each book to be presented one time during each week.

Follow-up

The generalization phase of the study was conducted immediately following the intervention phase and lasted for 1- week consisting of three sessions lasting approximately 30 minutes. The generalization phase of the study consisted of reading a book that was not presented in the intervention phase of the study (Dyches et al., 2002; Mims, Browder, Baker, Lee, Spooner, 2009; Rosa-Lugo & Kent Walsh, 2008) but with identical strategies (e.g., SuperTalker, sentence strips with picture symbols, individual symbols, communication board, objects, storyboards, BigMac) presented during intervention. All the steps of the task analysis were presented by the researcher in an energetic and enthusiastic manner.

The researcher implemented the maintenance phase after the introduction of a short break from the initial intervention. A 1-week intermission from intervention (e.g., books and materials) and a 1- week break from all strategies and interventions that were implemented prior to the initiation of the maintenance phase of the study. During this 2-week period the participants were not exposed to any of the materials that were used during the study (e.g., adapted book, story boards, etc.). A 2-week intermission was determined to be adequate in other studies (Fallon, Light, McNaughton, Drager, & Hammer, 2004; Mims et al.; Rosa-Lugo & Kent-Walsh) and was subsequently employed for this study. Upon completion of the intermission, the researcher

reintroduced the initial three adapted books and the intervention strategies employed during intervention to determine whether the participants maintained correct and independent responses to steps of the task analysis for shared stories. The reintroduction of intervention books and materials relating to UDL components were referred to as the maintenance phase of the study. The maintenance phase of this study was conducted three times a week for approximately 30 minutes for 2 weeks, which was consistent with the presentation of books during the intervention phase (Cuvo, Leaf, & Borakove, 1978).

Instrumentation

The *Task Analysis for Shared Stories,* developed by Browder, Mims, et al. (2008; see Appendix A), which was included in this study, focused on facilitating appropriate responses to each step of the task analysis. The task analysis was presented in the Browder, Mims, et al. (2008) study and was adapted from Browder, Trela, and Jimenez's (2007) work, which addressed increasing participation of students with significant intellectual disabilities by the researcher presenting each step of a task analysis. Task analysis instruction with prompting cues has been successful for instructing students with moderate to severe intellectual disabilities in areas such as household chores, job skills, and, more recently, academics (Browder, Trela, & Jimenez; Griffin, Wolery, & Schuster, 1992; Maeser & Thyer, 1990). The data collected from a task analysis can be utilized to allow the teacher to self-monitor to ensure that all steps are included in the lesson (Browder, Trela, & Jimenez; Spooner, 2007). Task analysis can be useful to the teacher in small group format to ensure that all participants have an opportunity to engage in each step (Browder, Trela, & Jimenez).

Each session consisted of a 16-step task analysis (see Appendix A), which measured participant independent correct responses to the steps during shared story reading. The steps of the *Task Analysis for Shared Stories* included tasks such as the participant choosing a book to read, activating an AAC device to repeat storylines, looking at or touching objects or symbols relating to the shared story to predict and answer questions. The steps included choice making, attending to the cover, attending to introduction of story, predicting what the story is about, *recognizes own name in story, attends to object presented that relates to story, activates device to complete a repeated storyline* (the 3 italicized skills are repeated three times), shows a reaction to the surprise element, using objects to select what the story was about, indicates desire to hear the story again using communication boards or large picture symbol (see Appendix A). The study was an extension of Browder, Mims, et al.'s (2008) study; therefore, threats to the external validity of the intervention were addressed in the previous study (Horner et al., 2005).

Research Procedures

Training for Observers

Twaney and Gast (1984) indicated that observers are typically individuals who are available in the environment at the time and willing to be trained. All observers (i.e., classroom teachers) received training for scoring the task analysis by an explanation of the score code and were required to practice scoring the target responses (i.e., no responses, independent correct responses, reactions, and incorrect responses). For this study, nonresponses were defined as opportunities presented to the participant to respond but no reaction was conveyed. Independent correct responses were defined as opportunities presented to the participant to respond with observable behaviors based on what the participant could perform physically without assistance

or were developed by the team during the planning meeting, which corresponded to each participant's UDL checklist with TA. Reactions were defined as opportunities presented to the participant to respond as indicated by an alteration in a nonverbal behavior such as widening eyes, repositioning of head, or a vocalization (i.e., verbal, nonverbal, or behavioral improvements over a nonresponse). Incorrect responses were defined as opportunities presented to the participant to respond to probes but the responses were inconsistent, incorrect or nonresponsive. Definitions were reviewed by all observers during training sessions and after the completion of each phase of the study, which, according to Kazdin (1982), is necessary to ensure continued accuracy. To ascertain interobserver agreement, all principal raters reviewed 33.3% or one session per week viewing digital recordings of lessons. The scores were compared step by step. Practice of scoring continued until observers obtained a proficiency of 87% or greater in scoring.

Establishing Interobserver Agreement

Interobserver Reliability

Interobserver reliability refers to the degree of consistency between raters on the scoring of participants' responses to steps of a task analysis. Reliability refers to the step-by-step agreement (Kazdin, 1982), which were employed, and results were compared to determine interobserver agreement (reliability). Step-by-step agreement refers to instances in which both observers concur on the occurrence of target response within the task analysis. Disagreements are instances in which the observers' score in target responses did not concur.

Interobserver agreement was calculated using the number of agreements and dividing this number by the number of agreements plus the number of disagreements then multiplying by 100.

This provided a percentile score, which was used to determine the rate of interobserver agreement. Kazdin (1982) recommends a 20% margin of error in observer agreement, with lower levels desired for studies with two or fewer variables. Discrepancies in excess of 20% were reviewed on the DVD-RW and the observers came to an agreement pertaining to the proper coding. The ratio of observer agreement was computed by the formula proposed by Kazdin (1982).

The only instances that the researcher and classroom teachers did not concur were during the initial intervention phase of the study. During this phase some disagreement in scoring student responses was evident. The primary disagreement concerned the comprehension of the participants' responses. The researcher reviewed and discussed that in order for participants' responses to be scored as correct, the responses had to be comprehended by the general educational community, not just the professional who worked daily with the participants. After this discussion, the teachers' and researcher's score sheets concurred on the majority of the steps of the task analysis (i.e., 91.8% for school one and 92.5% for school two).

Fidelity

Procedural fidelity was accomplished by reviewing all steps of the task analysis with all three UDL components during planning meetings with the assistance of a checklist (see Appendix B). Procedural fidelity for the researcher consisted of the delivery of all steps of the task analysis during presentation of an adaptive book to a small group format (Browder, Trela, & Jimenez, 2007; Browder, Mims, Spooner, Ahlgrim-Delzell, & Lee, 2009), which also was digitally recorded. Fidelity was accomplished by team members completing a UDL component checklist (see Appendix B) for each step of the task analysis during team planning meetings.

This consisted of each component of the UDL being discussed for each step of the *Task Analysis for Shared Stories* (see Appendix A).

Data Analysis

Kazdin (1982) stated that a treatment effect is more apparent when a trend can be seen in the data and the trend occurs expeditiously after a change in intervention (or treatment or condition). Two constructs that are related to rate of change are trend and latency. A trend refers to the propensity of performance to change systematically over time. Latency is associated with the rate of change (Tawney & Gast, 1984). The mean is the mathematical average of the scores obtained by the participants on the task analysis for each phase. This was obtained by adding all the individual scores and dividing by the number of sessions to report the mean (Ray, 1993). The mean score indicated that the intervention produced a change in the behavior of the participants' responses as measured on the task analysis.

Experimental criteria are typically employed to evaluate data within a single subject design (Kazdin, 1982). *Experimental criterion* is defined as the methodology employed to evaluate data and determine whether the intervention elicited a meaningful effect (Kazdin, 1982). Determining a particular phase of the study was effective can be accomplished by inspecting a graphic representation of the data (Kazdin). Alterations in trends are essential in demonstrating systematic increases or decreases during the implementation of an intervention (Kazdin). This methodology was utilized in this study in order to determine the effectiveness of each phase or each condition of the study.

Baseline data were collected to indicate alterations or a trend in the behavior of responding to steps in a task analysis for shared stories. During all phases of the study, sufficient

data points were collected to detect a trend in participant's response patterns. Kazdin stated that five data points are sufficient to ascertain the participants' performance. In this study more than five data points were collected for all participants. Prolonged baseline data were not necessary for this study, due to the fact that all participants required prompts and assistance to complete steps of the task analysis (Mims, Browder, Baker, Lee, & Spooner, 2009; Rusa-Luga & Kent-Walsh, 2009). Time-series analysis is appropriate for comparing changes in the trend of the different phases in a study such as baseline and intervention (Kazdin; Ray, 1993). Time-series analysis was appropriate for this study secondary to the fact that it facilitates comparing data over time of the individual phases for individual participants.

Kazdin (1982) indicated for single subject research designs numeric graphical representation of the data can be utilized to assess and demonstrate the treatment effect of a study. All data points for each phase of the study were graphically represented using a scatter plot for each participant. Frequencies of correct independent responses were represented on the vertical axis and baseline, intervention, generalization, and maintenance sessions were represented on the horizontal axis. Dots representing the number of correct independent responses for each participant were connected with lines. Baseline, intervention, generalization, and maintenance phases were separated by dotted vertical lines. Analyses of the data were conducted by analyzing the changes in frequencies on the score on the task analysis across conditions. Differences in the rate of change were evaluated by comparing participants' average scores across conditions during the study. Kazdin (1982) indicated that an increase in the mean number of independent correct responses between baseline and intervention corresponded to a positive treatment effect for the participants.

The criterion for determining successful progression during shared story reading was derived from the task analysis used in Browder, Mims, et al. (2008). Because this study is an extension of Browder, Mims, et al. it is important to utilize identical measures in this study (Kazdin, 1982; Ray, 1993; Tawney & Gast, 1984). Therefore, the task analysis employed in this study has already been validated in Browder, Mims, et al. To further validate the task analysis, the researcher aligned the steps of the task analysis with specific principles associated with the Alabama State Department of Education (ALSDE) Extended Standards for Reading (see Appendix A; Morton, 2006). The ALSDE standards are assessed or measured by the Alabama Alternative Assessment (AAA), which was also developed by the ALSDE (Morton, 2006). Fifteen steps of the task analysis that related to the reading extended standards for the elementary grade levels are all considered complexity level one standards. The one step of the task analysis (i.e., choose a book) that does not relate to the ALSDE standards is considered an emergent skill. Scores obtained using complexity level 1 standards are targeting the 25th percentile and will never be considered as meeting the extended standards as measured by the AAA (Morton, 2011). However, considering the mental abilities of the participants included in this study, the steps in the task analysis utilized are considered adequately challenging and developmentally appropriate.

In other words, the participants' progress on the task analysis is at complexity level 1, which targets 25% mastery as measured by the AAA criteria. In order to be assessed using the AAA, students have to have an IQ of 55 or below, which is one standard deviation below the mean IQ to meet the eligibility criteria for mental retardation as defined by the ALSDE (Morton, 2009). The IQs for all of the participants in this study were at or exceeded four standard deviations below the standardized mean IQ (i.e., 100), two standard deviations below the criteria

for mental retardation (i.e., 70), and one standard deviation below the criteria to be assessed with the AAA (i.e., 55). Using complexity level 1 extended reading standards, which coincided with the steps of the task analysis in Browder, Mims, et al. (2008), provides obtainable but challenging goals for the study participants. After reviewing the aforementioned information, the researcher determined that making progress toward 16-step task analysis would be appropriate assessment for the participants in this study.

The following data were then associated with specific criteria for scoring the *Task Analysis for Shared Stories*. According to ALSDE AAA criteria, scores between 0% to 25% are in the category of *does not meet academic content standards*, scores above 25% to 50% are categorized as *partially meets academic content standards*, scores above 50% to 75% are considered as *meets extended standards*, and scores above 75% to 100% are categorized as *exceeds academic content standards*. The academic achievement levels, which are obtained from standardized assessments, define the degree to which students are mastering standards as set forth by the state for individual grade levels. The results of the Alabama Reading and Math Test (ARMT), Alabama High School Graduation Exam (AHSGE), and AAA are reported in the four academic achievement levels (e.g., level IV = exceeds academic content standards; Morton, 2011). Therefore, using the same terminology and relating these criteria to the task analysis, which has a total of 16 possible points, translates to scores of 0-4 were associated with *does not meet academic content standards*, 4 to 8 is *partially meets academic content standards*, 8 to 12 is *meets academic content standards*, and 12 to 16 is considered *exceeds academic content standards* (Morton; Quenemoen, Perie, & Kearns, 2010). Scores of 8 to 12, which are in the range of *meets extended standards*, are considered acceptable scores for mastery on the task analysis.

Table 3

Rubric Explanation

Traditional scoring for AAA with extended standards	Percentages used for AAA and for TA	Wording on AAA and used for TA	All standards for Task Analysis	TA
Complexity level 1	0-25%	*does not meet academic content standards*	Complexity level 1	0-4
Complexity level 2	Above 25%-50%	*partially meets academic content standards*	Complexity level 1	4 -8
Complexity level 3	Above 50%-75%	*meets extended standards*	Complexity level 1	8-12
Complexity level 4	Above 75%-100%	*exceeds academic content standards*	Complexity level 1	12-16

Trends in baseline, intervention, and follow-up phases (i.e., generalization, maintenance) were examined. Means from the four phases of the study were compared to determine whether the intervention was successful. The numbers of independent correct responses on the task analysis were recorded, graphically represented, and visually inspected. Trend lines were employed to determine the daily rate of change as well as estimated and projected values for independent correct responses for all phases of the study. The projected trend line was used to predict a participant's likely performance on future assessments in the event no intervention was implemented (Kazdin, 1982). According to Kazdin, the projected trend line is an essential element in single subject design because it provides criterion to compare baseline to the intervention phases of a study. Values from the estimated and projected values of the trend lines were compared to the phase of the study that proceeded and/or followed the targeted phase of the study.

Summary

In this chapter, study designs and methodology were reviewed with particular detail to this study. Participants, settings, instrumentation, and procedures were discussed with detail. Data analysis was provided based upon the plan for the study. The variables (i.e., independent and dependent) were discussed in this third chapter. The results of this study are presented in chapter 4.

CHAPTER 4

RESULTS

The purpose of this study was to determine whether employing the steps of UDL with the framework of planning literacy instruction for students with severe and multiple disabilities would improve independent correct responses on a task analysis while participating in a group format. This study was an extension of Browder, Mims, et al. (2008); however, it employed small group instruction as opposed to individual instruction. Unlike Browder, Mims, et al., who collected data only on a baseline and intervention phase, this study expanded the previous research and examined whether participants could maintain independent correct responses during generalization and maintenance phases. This study focused on students with severe and multiple disabilities participating in target literacy skills. To investigate the effects of a task analysis paired with UDL components on this population, a single subject design across participants was utilized. The data consisted of the number of correct independent participant responses on a task analysis during a shared story small group literacy lesson.

Six participants with severe and multiple disabilities were selected for inclusion in this study. The participants for this study consisted of five males and one female between the ages of 6 and 11 who attended a self-contained elementary classroom for individuals with *significant cognitive and multiple disabilities,* which is the terminology used by this particular school district. All of the participants were identified as nonverbal (i.e., vocabulary of less than 100 words) and had significant intellectual disabilities (i.e., IQ less that 55 on an individually

administered test of intelligence). One of the participants had an expressive vocabulary of zero words and had limited receptive capabilities. Three participants had a diagnosis of Autism Spectrum Disorder; three of the participants had a diagnosis of cerebral palsy, and one participant had a diagnosis of Down's Syndrome. One participant exhibited echoic speech patterns and two had an expressive vocabulary of approximately 50 words, which were mostly unintelligible. Two participants had an expressive vocabulary ranging from 5-20 words and one participant had no words. All of the students within the targeted classrooms interacted in the literacy lessons; however, data were collected only for participants of the study.

A single subject design across participants within the framework of a small group setting was employed for this study. The initial phase of the study consisted of baseline. Phase two of the study was the intervention stage. Phase three was generalization, during which the books utilized during the intervention phase were replaced by different adaptive book not used during the intervention phase. During phase four, the maintenance phase, the participants were presented with the initial three books and AAC techniques/devices employed during the intervention phase after a brief intermission.

Reliability

Reliability measures were conducted across all conditions for all participants. During each phase of the study, reliability was conducted on 33.3% of the recorded data. In other words, for one of the three shared story intervention sessions the classroom teacher viewed the digital recording of participants during shared story reading. The classroom teacher used the task analysis score sheet (see Appendix G) to record the participants' (in her classroom) responses to the researcher's questions and probes. All phases of the study were captured on a model

HDRCX160 Sony digital video recorder. All recordings were promptly scored and transferred to DVD/RWs by the researcher for storage in a locked vault. Because all of the shared story reading sessions were recorded, the classroom teachers were afforded the opportunity to view the shared story reading at their convenience. The DVD/RWs were made available to the classroom teachers to ensure interobserver agreement.

Reliability analysis was conducted using a step-by-step procedure described in chapter 3 for the participants' responses to each step of the task analysis. One of the three lessons (33.33%) for each participant was reviewed by the classroom teachers each week to maintain interobserver agreement. Agreement was calculated by taking the number of agreements and dividing it by the number of agreements plus disagreement then multiplying by 100. Interobserver agreement was consistently scored in excess of 91%. Interobserver agreement at School one was 91.8% and at School two Elementary School 92.5% interobserver agreement was obtained. The classroom teacher and researcher initially scored some responses inconsistently. However, after further discussion the consensus was reached that participants' responses must be understood by the individuals within the school environment who interact with the participant (e.g., SLP, researcher) not just those who interact with them on a daily basis and have interacted with the participant for multiple years.

Fidelity

Procedural fidelity was maintained by the classroom teacher via scoring whether the researcher presented each step of the task analysis to the participant. A procedural fidelity score was obtained by taking the number of present items and dividing by the total items then multiplying by 100. This score exceeded 98% across all phases of the study for the researcher

presenting steps of the task analysis. The fidelity at School one was 98.7% and at School two 99.1% fidelity was obtained. Another method to ensure procedural fidelity during the team planning meetings was by checking whether each step of the task analysis was discussed using the components of UDL. Fidelity associated with discussing the UDL components with each step of the task analysis was 100% at both settings.

Research Questions

1. What are the effects of the components of UDL on the number of independent correct responses for students in small group instruction to progress through a shared story as measured by the task analysis? (P. Mims, personal communication, January 6, 2010).

2. To what extent does the team planning process to individualize instruction generalize to shared story reading with a different book as measured by the task analysis? (P. Mims, personal communication, January 6, 2010).

3. What are the effects of the components of UDL on students' ability to maintain independent correct responses during small group instruction to progress through a shared story as measured by the task analysis? (P. Mims, personal communication, January 6, 2010).

Research Question 1 Data

The following data demonstrated the efficacy of the intervention as seen by the increased number of independent correct responses from baseline to intervention. The participants' number of independent correct responses were as follows: participant 1 baseline average 2.4 [range 0,4], intervention average 12.1 [range 3, 16]; participant 2 baseline average .50 [range 0, 1], intervention average 9.5 [range 3, 15]; participant 3 baseline average .71 [range 0. 2],

intervention average 12.2 [range 3, 16]; participant 4 baseline average 1.8 [range 0, 3], intervention average 11.8 [range 4; 15]; participant 5 baseline average .31[range 0.1], intervention average 10.2 [range 3. 15]; participant 6 baseline average 2.3[range 1, 3], intervention average 11.6 [range 4, 16]; (see Table 4).

Table 4

Response to Question 1

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6
Baseline Average	2.4	.50	.71	1.8	.31	2.3
Baseline Range	[0, 4]	[0, 1]	[0, 2]	[0, 3]	[0, 1]	[1, 3]
Intervention Average	12.1	9.5	12.2	11.8	10.2	11.6
Intervention Range	[3, 16]	[3, 15]	[3, 16]	[4, 15]	[3, 15]	[4, 16]

Research Question 2 Data

The following data demonstrated the efficacy of the intervention as seen by the increased number of independent correct responses from intervention to generalization. The participants' number of independent correct responses were as follows: participant 1 intervention average 12.1 [range 3.16], generalization average 13.0 [range 13, 13]; participant 2 intervention average 9.5 [range 3, 15], generalization average 13.3 [range 13, 14]; participant 3 intervention 12.2 [range 3, 16], generalization average 13.3 [range 12, 15]; participant 4 intervention average 11.8 [range 4, 15], generalization average 13.0 [range 13; 13]; participant 5 intervention average 10.2 [range 3.15], generalization average 13.8 [range 11, 16]; participant 6 intervention average 11.6 [range 4, 16], generalization average 12.7 [range 12, 13]; (see Tables 5).

Table 5

Response to Question 2

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6
Intervention average	12.1	9.5	12.2	11.8	10.2	11.6
Intervention range	[3, 16]	[3, 15]	[3, 16]	[4, 15]	[3, 15]	[4, 16]
Generalization average	13	13.3	13.3	13	13.8	12.7
Generalization range	[13, 13]	[13, 14]	[12, 15]	[13, 13]	[11, 16]	[12, 13]

Research Question 3 Data

The following data demonstrated the efficacy of the intervention as seen by the increased number of independent correct responses from generalization to maintenance. The participants' number of independent correct responses were as follows: participant 1 intervention average 12.1 [range 3.16], generalization average 13.0 [range 13, 13], maintenance average 15.3 {range 14, 16]; participant 2 intervention average 9.5 [range 3, 15], generalization average 13.3 [range 13, 14], maintenance average 15.0 [range 14,16]; participant 3 intervention 12.2 [range 3, 16], generalization average 13.3 [range 12, 15], maintenance average 15.5 [range 14, 16]; participant 4 intervention average 11.8 [range 4, 15], generalization average 13.0 [range 13; 13], maintenance average 15.0 [range 15, 15]; participant 5 intervention average 10.2 [range 3.15], generalization average 13.8 [range 11, 16], maintenance average 13.8 [range 111. 16]; participant 6 intervention average 11.6 [range 4, 16], generalization average 12.7 [range 12, 13], maintenance average 14.3 [range 13, 16]; (see Tables 6).

Table 6

Response to Question 3

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6
Intervention average	12.1	9.5	12.2	11.8	10.2	11.6
Increase over baseline	*60.6%*	*56.4%*	*71.9%*	*62.5%*	*62.5%*	*58.1%*
Generalization average	13	13.3	13.3	13	13.8	12.7
Increase over intervention	*5.7%*	*23.7%*	*6.8%*	*7.5%*	*9.7%*	*6.9%*
Maintenance average	15.3	15	15.5	15.	13.8	14.3
Increase over generalization	14.3%	10.7%	13.8%	12.5%	13.2%	10%

Participants

Participant 1

At the onset of the study, Participant 1's scores on the *Task Analysis for Shared Stories* (see Appendix A) did not meet academic content standards as defined by the researcher and based on ALSDE AAA rubric (Morton, 2006; Quenemoen et al., 2010). Through shared story reading in a small group format, Participant 1 demonstrated an increase in the total number of independent correct responses on the task analysis between baseline and intervention phases, and exceeded academic content standards during the intervention. Participant 1 continued to exceed the ASLDE extended standards for academic content during the generalization and maintenance phases of the study. These results are explained in detail below and visually presented (see Figure 3).

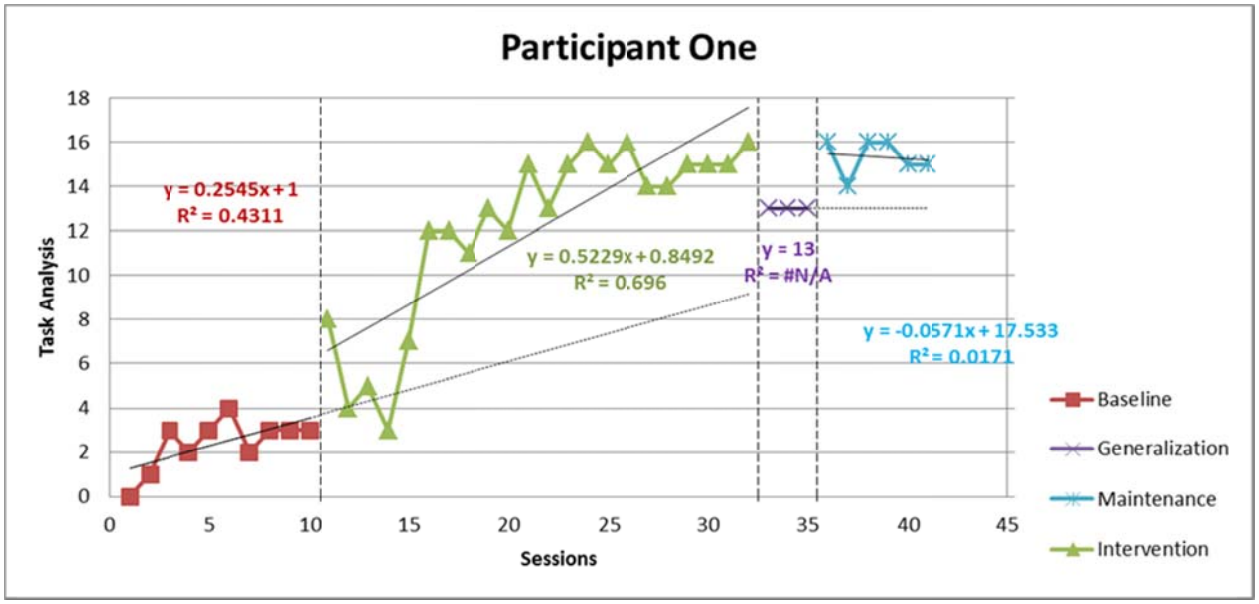

Figure 3. Participant 1's data across phases.

Baseline phase. Participant 1 did not meet academic content standards set by the researcher and based on the ALSDE AAA scoring rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2010) during the baseline phase of the study, averaging 2.4 independent correct responses with an estimated starting point of 1.3 and endpoint of 3.5 independent correct responses (*SD* = 1.2, range [0, 4]; see Figure 3).

During baseline, Participant 1 routinely responded correctly to answering yes or no to the question about wanting to read the book again and choosing a book to read. Participant 1 had independent correct responses to the following steps on the task analysis: react to name, react to surprise element, attend to book, attend to material, and focus on objects for at least one session. Participant 1 obtained his highest score on day 6 of the 10 baseline sessions, in which he had correct independent responses to four of the steps on the task analysis. The steps were attend to book, attend to materials, react to name (one time), and answer yes or no to the question about wanting to read the book again. Participant 1 struggled with all other aspects of the on the task

analysis (i.e., predict what the story is about, complete a storyline, answer the question what the story was about using the prediction objects).

The trend line estimated that Participant 1 would have obtained a score of 9.1 (meets expectations) without intervention. In this instance, during the baseline phase of the study, the projected trend line indicated that Participant 1 would have obtained a score of 9.1 for baseline during shared story reading. Therefore, presumably at the end of intervention on day 32, the participant's projected score would be a 9.1 on the task analysis even with no intervention, which falls in the range of meets the ALSDE extended standards for academic content, which is in the 50th to 75th percentile (Morton, 2006).

Intervention phase. Participant 1 exceeded the criteria set by the researcher and based on the ALSDE rubric for AAA (see Appendix H) extended standards for academic content during the intervention phase of the study (Morton, 2006; Quenemoen et al., 2010). Participant 1 averaged 12.1 independent correct responses (*SD* = 4.1, range [3, 16]). Comparing the average independent correct responses during intervention to the average during baseline revealed an overall increase of 60.6%; an increase of 9.7 independent correct responses from baseline to intervention.

During the initial phase of intervention, Participant 1 routinely had correct independent responses to the following steps of the *Task Analysis for Shared Stories* (see Appendix A): choose a book, predict what the story is about using objects shown to introduce the story, focus on objects when named in the story and displayed to the participant, react to surprise element, and answer yes or no to the question do you want to read the book again. Participant 1 struggled with incorrect responses or no responses to attend to book, attend to materials used to introduce

the story, react to name that is embedded within the story (which is presented three times), complete the storyline, and answer the question about what was the story about using prediction objects.

Participant 1 obtained three scores of 16 during the 22 days of intervention. On days 24, 26, and 32, Participant 1 had independent correct responses to choose a book, attend to a book, attend to materials, predict what the book is about, react to name embedded within the story three times, focus on objects when named and displayed, complete a storyline, react to surprise element, answer what the story was about using predictions objects, and answer yes or no to "do you want to read the story again?"

The estimated trend line for the intervention phase produced an initial estimated score of 6.6 independent correct responses on the task analysis and a daily rate of change of +0.52 independent correct responses. This estimate produced an estimated score of 16[1] at the end of the intervention, an increase of 58.7% from the start of the intervention. Comparing the difference between the estimates from the trend line at the end of baseline (3.5) with the beginning of intervention (6.6) was an increase of 3.1 independent correct responses, demonstrating a 19.4% increase from baseline to intervention. These results demonstrated that the intervention produced a higher number of initial correct independent responses than baseline.

Comparing the difference between the estimates from the trend line at the end of intervention (16; see Footnote 1) against the estimated values using the projected baseline trend line (9.1), revealed a difference of 6.9 independent correct responses, an increase of 43.1% for intervention over baseline. These results demonstrated that the intervention produced a higher daily rate of change in the number of independent correct responses. Taken together, these data

[1] The projected trend line indicated that the value of the independent correct response would exceed 16, which is the maximum score attainable on the task analysis. Therefore, all values above 16 have been truncated.

revealed that intervention produced a predicted daily rate of change in obtaining independent correct responses that was more than twice that of baseline.

Generalization phase. Participant 1 continued to exceed the extended standards for academic content standards based on the ALSDE rubric for the AAA (see Appendix H; Morton, 2006; Quenemoen et al., 2010) as the criteria set forth by the researcher and during the generalization phase of the study, averaging 13 independent correct responses (*SD* = 0, range [13, 13]). Comparing this value to the average during intervention revealed an overall decrease of 5.7 %, equivalent to .9 independent correct responses.

Participant 1 scored 13 independent correct responses during the 3 days of the generalization phase. Participant 1 routinely had independent correct responses to the following steps of *Task Analysis for Shared Stories* (see Appendix A): Choose a book, attend to a book, attend to materials, predict what the book is about, focus on objects when named and displayed, complete a storyline, react to surprise element, answer what the story was about using predictions objects, and answer yes or no to do you want to read the story again. Participant 1 struggled with react to the presentation of his name embedded within the story at least three times.

The estimated trend line for the generalization phase produced an initial estimated score of 13 independent correct responses on the task analysis and a daily rate of change of 0 independent correct responses. This estimate produced an estimated score of 13 at the end of generalization, an increase of 0.0% from the start of the generalization. Comparing the difference between the estimates from the trend line at the end of intervention (16; see Footnote 1) with the beginning of generalization (13) showed a decrease of 3 independent correct responses,

demonstrating an 18.7% decrease from intervention to generalization. These results demonstrated that the generalization produced a lower number of initial independent correct responses than intervention, but Participant 1 still exceeded extended content standards as criteria set by the researcher and based on the ALSDE AAA rubric (Morton, 2006; Quenemoen et al., 2010).

Comparing the difference between the estimates from the trend line at the end of generalization (13) against the estimated values using the intervention projected trend line (16; see Footnote 1), revealed a difference of 3 independent correct responses; a decrease of 18.7% from intervention to generalization. These results demonstrated that generalization produced a lower daily rate of change in the number of independent correct responses. Although lower than the intervention phase, Participant 1 still exceeded extended standards as criteria set by the researcher and based on the ALSDE AAA rubric during all points of the generalization phase Morton, 2006; Quenemoen et al., 2010). Participant 1 demonstrated that previous learning during intervention was transferred to new reading material during the generalization phase.

Maintenance phase. Participant 1 exceeded the extended standards for academic content standards as criteria set by the researcher and based on the ALSDE AAA rubric during the maintenance phase of the study (Morton, 2006; Quenemoen et al., 2010). Participant 1 averaged 15.3 correct independent responses (*SD* = .82, range [14, 16]). Comparing this value to the average during generalization revealed an overall increase of 14.4%, equivalent to 2.3 independent correct responses.

Participant 1 obtained a score of 16 independent correct responses during three out six sessions for the maintenance phase. Participant 1 routinely had independent correct response to

14 of the steps of the *Task Analysis for Shared Stories* (see Appendix A): Choose a book, attend to book, attend to materials, predict what the story is about, focus on objects when named in story and displayed to student, complete repeated storyline, react to surprise, answer the question what was the story about using prediction objects, answer yes or no to the question do you want to read the story again. Participant 1 struggled with the step associated with reacting to his name embedded within the story three times. This is also the step of the *Task Analysis for Shared Stories* (see Appendix A) that Participant 1 did not consistently respond to during the generalization phase of the study.

The estimated trend line for the maintenance phase produced an initial estimated score of 15.5 independent correct responses and a daily rate of change of -.06 independent correct responses. This estimate produced a score of 15.2 at the end of maintenance, an increase of 13.7% from generalization. Comparing the difference between the estimates from the trend line at the end of generalization (13) with the beginning of maintenance (15.5) was an increase of 2.5 independent correct responses, demonstrating a 12.5% increase from generalization to maintenance. These results demonstrated that the maintenance phase produced a higher number of initial independent correct responses than generalization.

Comparing the difference between the estimates from the trend line at the end of maintenance (15.2) against the estimated values using the generalization projected trend line (13), revealed a difference of 2.2 independent correct responses, an increase of 13.7% for maintenance over generalization. Although, these results demonstrated that maintenance produced a lower daily rate of change (-.06) in the number of correct independent responses, the data indicated an overall increase in independent correct responses. More importantly, the maintenance phase demonstrated that Participant 1 continued to exceed ALSDE extended

content standards after the intervention and generalization phases of the study, increasing the likelihood that these changes are enduring.

Trend line analysis. The results of this study suggested that Participant 1 demonstrated an overall increase in the number of independent correct responses during intervention. Although some regression was noted on the trend line during generalization and maintenance, the data indicated that once UDL components were implemented, the participant's progress was maintained throughout the study. The average number of independent correct responses was 12.1 for intervention, increased to 13.0 for the generalization phase, and demonstrated an additional increase to 15.3 for the maintenance phase of the study. Initially, during the baseline phase, Participant 1 met the criteria for does not meet extended standards, but progressed through to exceeded extended academic content standards during intervention. Participant 1 continued to exceed extended standards using new material during the generalization phase of the study, and continued to exceed extended standards during the maintenance phase of the study. The data indicated that once the UDL components were employed, Participant 1 was able to generalize these techniques into other situations. That is, the skills learned by Participant 1 were not an isolated occurrence, but were enduring, lasting through generalization and maintenance. Simply stated, shared story reading was highly effective in promoting literacy learning for Participant 1 (see Figure 5).

Implementation of UDL techniques. The previous results can only be understood within the context of instruction. The following is a qualitative description of Participant 1's observed behaviors, and the individualized instruction that was utilized during shared story reading.

During baseline, Participant 1 pointed to objects and verbalized some phrases during the shared story. After the team meetings, AAC was added for the intervention phase in an effort to facilitate more interactions and demonstrate comprehension. Participant 1 was able to employ verbalizations (i.e., unintelligible to unfamiliar people) when responding to probes and activating a voice output device (i.e., SuperTalker, Progressive Communicator) with a selection of two picture symbols to answer probes pertaining to the reading of the shared story.

An additional meeting was conducted during which reports from the Alabama Institute for the Deaf and Blind (AIDB) specialist were reviewed. The team determined that Participant 1 was in all likelihood an auditory learner. The teacher indicated that Participant 1 was able to see large pictures but is color blind so the white board and Elmo were added as AAC techniques. During shared story reading the researcher named the presented objects during predictive and comprehensive questioning.

After a subsequent planning meeting, the team decided to employ AAC techniques and devices in an alternative format (e.g., SuperTalker was turned vertically). In addition, black and white pictures were presented on a whiteboard using a Mimio Teach Interactive System and a digital projector (e.g., coverts a whiteboard into a smart board). Once these techniques were implemented, an increase in Participant 1's number of independent correct responses was noted during shared story reading.

After another team meeting, it was decided to present objects relating to the story that were tactile or auditory (e.g., sticky balls, laughing ball toy, water balloon). A different voice output device (i.e., a 7-level CommuniBuilder with a two frame raised divider) was presented to Participant 1 in an attempt to provide tactile stimulation of the placement of different symbols and allow refinement of communication choices. The team also decided to replace the black and

white pictures with copies of the actual book covers, which were presented on the smart board for Participant 1 to attend to and make his selection of the book to be read. Participant 1 used the Mimio Interactive Pen to indicate his selection for the desired book to be read on a given day.

Participant 2

At the onset of the study, Participant 2's scores on the *Task Analysis for Shared Stories* (see Appendix A) did not meet the academic content standards as set by the researcher and based on ALSDE scoring rubric for the AAA (see Appendix H; Morton, 2006; Quenemoen et al., 2010). Through shared story reading in a small group format, Participant 2 demonstrated an increase in the total number of independent correct responses on the task analysis between baseline and intervention phases, and exceeded extended standards set by the researcher and based on AAA rubric (Morton; Quenemoen et al.) for academic content during the intervention. Furthermore, Participant 2 continued to exceed the extended standards for academic content during generalization and maintenance phases of the study. The results are explained in detail below and visually represented (see Figure 4).

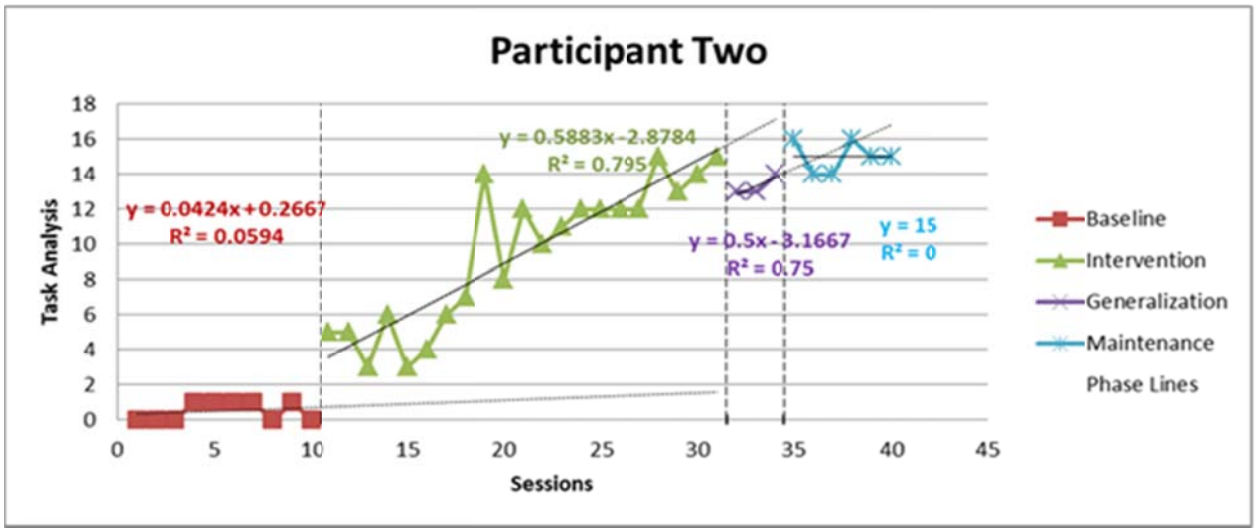

Figure 4. Participant 2's data across phases.

Baseline phase. Participant 2 did not meet academic content standards set by the ALSDE during the baseline phase of the study, averaging .50 independent correct responses with an estimated starting point of .3 and endpoint of .7 independent correct responses (*SD* = 5.3, range [0, 1]; see Figure 4).

During baseline, Participant 2 routinely responded to react to a surprise element in the story. Participant 2 had an independent correct response to various steps of the task analysis during the 10 baseline sessions (i.e., choose a book, attend to materials, focus on objects). Participant 2 struggled with other steps of the task analysis (i.e., attend to book, predict what the story is about, react to name embedded within the story, complete a storyline, answer what the story was about using prediction objects, and answer yes or no to do you want to read the story again).

The trend line estimated that Participant 2 would have obtained a score of 1.6 (does not meet expectations) without intervention. In this instance, during the baseline phase of the study the projected trend line indicated that Participant 2 would have obtained a score of 1.6 for

baseline during shared story reading. Therefore, presumably at the end of the intervention on day 31, the participant's projected score would be a 1.6 on the task analysis even with no intervention, which does not meet extended content standards as set by the researcher and based on the ALSDE AAA rubric, because it falls below the 25th percentile (Morton, 2006; Quenemoen et al., 2010).

Intervention phase. Participant 2 met the extended standards for academic content standards as set by the researcher and based on the ALSDE AAA rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2010) during the intervention phase of the study. Participant 2 averaged 9.5 correct independent responses (*SD* = 4.1, range [3, 15]). Comparing the average independent correct responses during intervention to the average during baseline revealed an overall increase of 56.3%, an increase of 9 correct responses from baseline to intervention.

During the initial phase of intervention, Participant 2 routinely had independent correct responses to the following steps of the *Task Analysis for Shared Stories* (see Appendix A): Attend to book, attend to materials, react to surprise element. In the beginning, Participant 2 struggled with incorrect responses or no responses to choose a book, predict what the story is about, react to name, focus on objects when named and displayed, complete the storyline, answer the comprehension question of what was the story about using prediction objects, and answer yes or no to whether he wanted to read the story again.

Participant 2 had two scores of 15 out of the 21 days of intervention. On days 28 and 31, Participant 2 had independent correct responses to choose a book, attend to a book, attend to materials, predict what the book is about, react to name three times, focus on objects when named and displayed, complete a storyline, react to surprise element, and answer yes or no to do

you want to read the story again. Even on the days when Participant 2 obtained 15 independent correct responses he struggled with incorrect or no responses to answering what the story was about using predictions objects.

The estimated trend line for the intervention phase produced an initial estimated score of 3.6 correct independent responses and a daily rate of change of +0.59 independent correct responses. This estimate produced an estimated score of 15.4 at the end of intervention, an increase of 73.8% from the start of the intervention. Comparing the difference between the estimates from the trend lines at the end of baseline (.7) with the beginning of intervention (3.6) was an increase of 2.9 independent correct responses, demonstrating an 18.1% increase from baseline to intervention. These results revealed that the intervention produced a higher number of initial correct independent responses than baseline.

Comparing the difference between the estimates from the trend line at the end of intervention (15.4) against the estimated values using the projected baseline trend line (1.6), revealed a difference of 13.8 independent correct responses, an increase of 86.3% for intervention over baseline. These results demonstrated that the intervention produced a higher daily rate of change in the number of correct independent responses. Taken together, these data revealed that intervention produced a predicted daily rate of change in obtaining independent correct responses that was more than 10 times that of baseline.

Generalization phase. Participant 2 exceeded the extended standards for academic content standards as set by the researcher and based on the ALSDE AAA rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2010) during the generalization phase of the study, averaging 13.3 independent correct responses (*SD* = .58, range [13, 14]). Comparing this value to

the average during intervention revealed an overall increase of 23.7% (3.8) independent correct responses.

Participant 2's scores ranged from 13 to 14 on the three days of the generalization phase. Participant 2 routinely had independent correct responses to the following steps on the task analysis: Choose a book, attend to a book, attend to materials, predict what the book is about, focus on objects when named and displayed, complete a storyline, react to surprise element, answer what the story was about using predictions objects, and answer yes or no to the question "do you want to read the story again?" Participant 2 continued to struggle with reacting to the presentation of his name embedded within the story at least three times.

The estimated trend line for the generalization phase produced an initial estimated score of 12.8 correct independent responses and a daily rate of change of .5 correct independent responses. This estimate produced an estimated score of 13.8 at the end of generalization, an increase of 6.3% from the start of generalization. Comparing the difference between the estimates from the trend lines at the end of intervention (15.4) with the beginning of generalization (12.8) is a decrease of 2.6 independent correct responses, demonstrating a 16.3% decrease from intervention to generalization. These results demonstrated that generalization produced a lower number of initial independent correct responses than intervention, but Participant 2 still exceeded extended standards as set by the researcher and based on the ALSDE AAA rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2010).

Comparing the difference between the estimates from the trend line at the end of generalization (13.8) against the estimated values using the intervention projected trend line (16), revealed a difference of 2.2 correct independent responses, a decrease of 13.7% from intervention to generalization. These results demonstrated that the generalization produced a

lower daily rate of change in the number of correct independent responses. Although lower than the intervention phase, Participant 2 still exceeded extended standards as set by the researcher and based on the ALSDE AAA rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2010) during all points of the generalization phase. Participant 2 demonstrated that previous learning during intervention was transferred to new reading material during the generalization phase.

Maintenance phase. Participant 2 exceeded the extended standards for academic content standards as set by the researcher and based on the ALSDE AAA rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2010) during the maintenance phase of the study. Participant 2 averaged 15 correct independent responses (*SD* = .9, range [14, 16]). Comparing this value to the average during generalization revealed an overall increase of 10.7% (1.7) independent correct responses.

Participant 2 obtained a score of 16 independent correct responses during 2 out 6 days for the maintenance phase. Participant 2 routinely had independent correct response to 14 of the steps on the task analysis (i.e., choose a book, attend to a book, attend to materials, predict what the book is about, focus on objects when named and displayed, complete a storyline, react to surprise element, and answer yes or no to the question “do you want to read the story again?”). Participant 2 struggled with the steps to react to name embedded within the story and answer what was the story about when presented with the objects used for prediction. This is the same step of the task analysis that Participant 2 struggled with in previous phases of the study.

The estimated trend line for the maintenance phase produced an initial estimated score of 15 correct independent responses and a daily rate of change of zero correct independent responses. This estimate produced a score of 15 at the end of maintenance, an increase of 7.5 %

from generalization. Comparing the difference between the estimates from the trend lines at the end of generalization (13.8) with the beginning of maintenance (15) produced an increase of 1.2 independent correct responses, demonstrating a 7.5% increase from generalization to maintenance. These results demonstrated that the maintenance phase produced a higher number of initial correct independent responses than generalization.

Comparing the difference between the estimates from the trend line at the end of maintenance (15) against the estimated values using the projected generalization (16; see footnote 1), revealed a difference of -1 independent correct responses, which is a decrease of 6.2% for maintenance over generalization. Although, these results established that maintenance produced a lower daily rate of change (0.0) in the number of correct independent responses, the data indicated an overall increase in independent correct responses. More importantly, the maintenance phase demonstrated that Participant 2 continued to exceed extended content standards as set by the researcher and based on the ALSDE AAA rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2010) after the intervention and generalization phases of the study, increasing the likelihood that these changes are enduring.

Trend line analysis. The results of this study suggested that Participant 2 revealed an overall increase in the number of independent correct responses during intervention. Although some regression was noted on the trend line during generalization and maintenance, the data indicated that once UDL components were implemented, the participant's progress was maintained throughout the study. The average number of independent correct responses was 9.5 for intervention, increased to 13.3 for the generalization phase, and demonstrated an additional increase of 15.0 for the maintenance phase of the study. Initially during the baseline phase,

Participant 2 did not meet extended academic content standards, but met extended standards during intervention. Participant 2 continued to make progress enabling him to exceed extended standards during the generalization and maintenance phases of the study. The data indicated that once the AAC techniques and devices were employed Participant 2 was able to generalize these techniques into other situations. That is, the skills learned by Participant 2 were not an isolated occurrence, but were enduring, lasting through generalization and maintenance. Simply stated, shared story reading was effective for Participant 2 (see Figure 4).

Implementation of UDL techniques. The previous results can only be understood within the context of instruction. The following is a qualitative description of Participant 2's observed behaviors, and the individualized instruction that was utilized during shared story reading. Prior to intervention, Participant 2 was able to employ simple phrases consisting of one to three word utterances, but typically communicated by pointing or grabbing at desired items. Participant 2 has begun to repeat words spoken by the teacher but frequently made self-stimulating growls and other sounds. Participant 2 was able to name pictures and pictures symbols while pointing to them. During baseline, Participant 2 grabbed at the objects as he verbalized and growled to elicit repeated storyline after the researcher said the beginning words several times during the shared story.

After the team planning meetings, AAC (i.e., 7-level CommuniBuilder) was added for the intervention phase in an effort to facilitate more interactions. An additional planning meeting was conducted during which the occupational therapist provided several suggestions for vestibular stimulation. The team determined that Participant 2 would likely benefit from wearing a tight bear hug vest with adjustable straps, having a weighted lap blanket, sitting in a Rifton

chair with a clear tray and an air pillow. Participant 2 also partook of vestibular stimulation exercises prior to listening to the shared story. During shared story reading, the researcher named and presented the objects for Participant 2 prior to asking the predictive and comprehensive questions listed on the task analysis.

After an additional planning meeting, the team decided that the voice output device was not considered the most effective mode of communicating for Participant 2 and added sentence strips with picture symbols representing the repeated storyline. This modification enabled Participant 2 to demonstrate an increase in his correct independent responses during shared story reading. The voice output device was available for Participant 2 if needed.

During the final team meeting, the team decided to perform the vestibular stimulation exercises (e.g., joint compressions, deep pressure massage) to calm the participant during the reading of the shared story, discontinued the weighted lap blanket and air pillow, and added a solid tray to the Rifton chair. During the last day of maintenance, Participant 2 completed the repeated storyline without picture symbol sentence strip and without being placed in the Rifton chair. Participant 2 was wearing his bear hug vest and received vestibular stimulation throughout the shared story reading.

Participant 3

At the onset of the study, Participant 3's score on the *Task Analysis for Shared Stories* (see Appendix A) did not meet the academic content standards as set by the researcher and based on the ALSDE AAA rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2010). Through shared story reading in a small group format, Participant 3 demonstrated an increase in the total number of independent correct responses on the task analysis between baseline and intervention

phases, and exceeded extended standards for academic content as set by the researcher and based on the ALSDE AAA rubric during the intervention (see Appendix H; Morton; Quenemoen et al.). Furthermore, Participant 3 continued to exceed the extended standards for academic content as set by the researcher and based on the ALSDE AAA rubric during generalization and maintenance phases of the study. The results are explained in detail below and visually represented (see Figure 5).

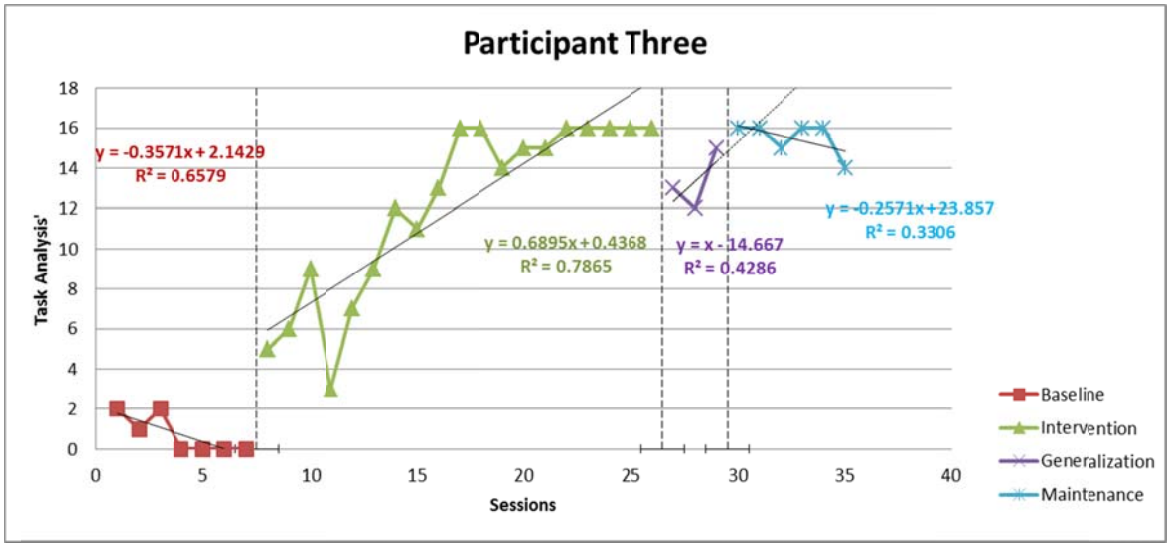

Figure 5. Participant 3's data across phases.

Baseline phase. Participant 3 did not meet academic content standards set as set by the researcher and based on the ALSDE AAA rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2010) during the baseline phase of the study, averaging .71 correct independent responses with an estimated starting point of 1.8 and endpoint of 0[2] correct independent responses (*SD* = .95, range [0, 2]; see Figure 5; see Footnote 2).

[2] The projected trend line indicated that the value of the independent correct response would be below 0, which is the minimum score attainable on the task analysis. Therefore, all values below zero have been truncated.

During baseline, Participant 3 routinely had independent correct responses to attend to book and attend to materials during the 7 sessions of baseline. On two days, Participant 3 had independent correct responses to both of these steps. Participant 3 struggled with incorrect responses or no responses to choose a book, predict what the book is about, react to name three times, focus on objects when named and displayed, complete a storyline, react to surprise element, answer what the story was about using prediction objects, and answer yes or no to "do you want to read the story again?"

The trend line estimated that Participant 3 would have obtained a score of 0.0 (does not meet expectations) without intervention. In this instance, during the baseline phase of the study, the projected trend line indicated that Participant 3 would have obtained a score of 0.0 for baseline during shared story reading. Therefore, presumably at the end of intervention on day 26, the participant's projected score would be a 0.0 (see Footnote 2) on the task analysis even with no intervention, which does not meet extended content standards as set by the researcher and based on the ALSDE AAA rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2010), because it falls below the 25th percentile.

Intervention phase. Participant 3 exceeded the extended standards for academic content standards as set by the researcher and based on the ALSDE AAA rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2010) during the intervention phase of the study. Participant 3 averaged 12.2 correct independent responses (*SD* = 4.4, range [3, 16]). Comparing the average independent correct responses during intervention to the average during baseline revealed an overall increase of 71.9%, an increase of 11.5 correct responses from baseline to intervention.

During the initial phase, intervention, Participant 3 routinely had independent correct responses to the following steps of the *Task Analysis for Shared Stories* (see Appendix A): attend to materials, predict what the story is about, complete the storyline, answer what the story was about using prediction objects, react to surprise, and answer yes or no to the question "do you want to read the story again?" Participant 3 struggled with incorrect responses or no responses to choose a book attend to book, react to name embedded within the story, and focus on objects when named and displayed.

Participant 3 obtained scores of 16 during 7 out of the 19 days of intervention. On days 16, 17, and 22 through 26, Participant 3 had independent correct responses to choose a book, attend to a book, attend to materials, predict what the book is about, react to name embedded within the story, focus on objects when named and displayed, complete a storyline, react to surprise element, answer what the story was about using predictions objects, and answer yes or no to "do you want to read the story again?"

The estimated trend line for the intervention phase produced an initial estimated score of 6 correct independent responses and a daily rate of change of +0.69 independent correct responses. This estimate produced an estimated score of 16 (see Footnote 1) at the end of intervention, an increase of 62.5% from the start of the intervention. Comparing the difference between the estimates from the trend lines at the end of baseline (0.0; see Footnote 2) with the beginning of intervention (6) was an increase of 6 independent correct responses, demonstrating a 37.5% increase from baseline to intervention. These results demonstrated that the intervention produced a higher number of initial correct independent responses than baseline.

Comparing the difference between the estimates from the trend line at the end of intervention (16; see Footnote 1) against the estimated values using the baseline trend line (0.0;

see Footnote 2), revealed a difference of 16 independent correct responses, an increase of 100% for intervention over baseline. These results demonstrated that the intervention produced a higher daily rate of change in the number of correct independent responses. Taken together, these data revealed that intervention produced a predicted daily rate of change that was inverse to baseline and in excess of 1.00 independent correct responses.

Generalization phase. Participant 3 continued to exceed the extended standards for academic content standards as set by the researcher and based on the ALSDE AAA rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2010) during the generalization phase of the study, averaging 13.3 independent correct responses (*SD* = 1.5, range [12, 15]). Comparing this value to the average during intervention revealed an overall increase of 9.8%, which is an increase of 1.1 independent correct responses.

Participant 3's scores ranged from 12 to 15 on the 3 days of the generalization phase. Participant 3 routinely had independent correct responses to choose a book, attend to a book, attend to materials, predict what the story is about, complete storyline, focus on objects, react to surprise element, and answer yes or no to "do you want to read the story again?" Participant 3 struggled with reacting to his name embedded within the story and answering what he thought the story was about using prediction objects.

The estimated trend line for the generalization phase produced an initial estimated score of 12.3 independent correct responses and a daily rate of change of 1 independent correct response. This estimate produced an estimated score of 14.3 at the end of generalization, an increase of 12.5% from the start of the generalization. Comparing the difference between the estimates from the trend lines at the end of intervention (16; see Footnote 1) with the beginning

of generalization (12.3) is a decrease of 3.7 independent correct responses, demonstrating a 23.1% decrease from intervention to generalization. These results demonstrated that generalization produced a lower number of initial independent correct responses than intervention, but Participant 3 still exceeded extended standards as set by the researcher and based on the ALSDE AAA rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2010).

Comparing the difference between the estimates from the trend line at the end of generalization (14.3) against the estimated values using the intervention trend line (16; see Footnote 1) revealed a difference of 1.7 independent correct responses, a decrease of 10.6% from intervention to generalization. These results demonstrated that the generalization produced a higher daily rate of change in the number of correct independent responses. Participant 3 still exceeded ALSDE extended standards during all points of the generalization phase. Participant 3 demonstrated that previous learning during intervention was transferred to new reading material during the generalization phase.

Maintenance phase. Participant 3 exceeded the extended standards for academic content standards as set by the researcher and based on the ALSDE AAA rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2010) during the maintenance phase of the study. Participant 3 averaged 15.5 independent correct responses (*SD* = .84, range [14, 16]). Comparing this value to the average during generalization revealed an overall increase of 13.8%, which is equal to 2.2 independent correct responses.

Participant 3 obtained a score 16 independent correct responses for 4 out of 6 days for the maintenance phase. For the other two days, Participant 3 routinely had independent correct responses ranging from 14 to 15 of the steps on the task analysis (i.e., choose a book, attend to a

book, attend to materials, predict what the book is about, focus on objects when named and displayed, complete a storyline, answering what the story was about using prediction objects, and answering yes or no to do you want to read the story again) Participant 3 struggled with incorrect responses to react to name embedded within the story and react to a surprise element.

The estimated trend line for the maintenance phase produced an initial estimated score of 16 (see Footnote 1) correct independent responses and a daily rate of change of -.26 correct independent responses. This estimate produced a score of 14.9 at the end of maintenance, a decrease of 3.7% from generalization. Comparing the difference between the estimates from the trend lines at the end of generalization, 14.3 with the beginning of maintenance (16; see Footnote 1) was an increase of 1.7 independent correct responses, demonstrating a 10.6% change from generalization to maintenance. These results demonstrated that the maintenance phase produced a higher number of initial correct independent responses than generalization.

Comparing the difference between the estimates from the trend line at the end of maintenance (14.9) against the estimated values using the projected generalization (16; see footnote 1) revealed a difference of -1.1 independent correct responses, which is a decrease of 6.9% for maintenance over generalization. Although, these results demonstrated that maintenance produced a lower daily rate of change (-.26) in the number of independent correct responses, the data indicated an overall increase in independent correct responses. More importantly, the maintenance phase demonstrated that Participant 3 continued to exceed extended content standards as set by the researcher and based on the ALSDE AAA rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2010) after the intervention and generalization phases of the study, increasing the likelihood that these changes are enduring.

Trend line analysis. The results of this study suggested that Participant 3 demonstrated an overall increase in the number of independent correct responses during intervention. Although some regression was noted in the trend line during generalization and maintenance, the data indicated that once UDL components were implemented the participant's progress was maintained throughout the study. The average number of independent correct responses was 12.2 for intervention, increased to 13.3 for the generalization phase, and demonstrated an additional increase of 15.5 for the maintenance phase of the study. Initially, during the baseline phase Participant 3 did not meet extended academic content standards, but exceeded extended standards during intervention, generalization, and maintenance phases of the study. The data indicated that once the UDL components with shared story reading were employed, Participant 3 was able to generalize these techniques into other situations. That is, the skills learned by Participant 3 were not an isolated occurrence, but are enduring lasting through generalization and maintenance. Simply stated, shared story reading was highly effective for Participant 3.

Implementation of UDL techniques. Participant 3 exhibited echolalia speech patterns, which typically consisted of repeating phrases employed by others. According to the classroom teacher, Participant 3 responded verbally with the word "no" to indicate a negative response and repeated the last word of a sentence to indicate an affirmative response. Participant 3 would look at and name a limited number of picture symbols. During baseline, Participant 3 played with the feet of many of the objects presented while repeating the last few words stated by the researcher during shared story reading.

During the team planning meeting, the team decided that AAC voice output device (i.e., Tech/Talk Communication Builder) with picture symbols relating to the repeated storyline

should be added for the intervention phase in an effort to facilitate more interactions. The team decided that the researcher should hold the objects by their feet to minimize the possibility of Participant 3 becoming fixated on the feet. During shared story reading, the researcher reminded Participant 3 to choose one of the presented objects to answer the questions that were listed on the task analysis.

An additional meeting was conducted during which the speech teacher, speech intern, classroom teacher, and researcher agreed that Participant 3 could communicate using sentence strips with picture symbols as a reminder to vocalize the repeated storyline of the shared story. The team decided that the voice output device was no longer needed so it was discontinued for Participant 3 at this point in the study.

After another team planning meeting, the team determined that reminders should be used more sparingly and primarily be employed when Participant 3 continued to fixate on the objects' feet. The team determined that altering the presentation in this manner should augment Participant 3's number of independent correct responses during shared story reading.

Participant 4

At the onset of the study, Participant 4's scores on the *Task Analysis for Shared Stories* (see Appendix A) did not meet the academic content standards set by the researcher and based on the ALSDE AAA rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2009). Through shared story reading in a small group format, Participant 4 demonstrated an increase in the total number of independent correct responses on the task analysis between baseline and intervention phases and exceeded extended standards for academic content during the intervention. Furthermore, Participant 4 continued to exceed the extended standards for academic content

during the generalization and maintenance phases of the study. The results are explained in detail below and visually represented (see Figure 6).

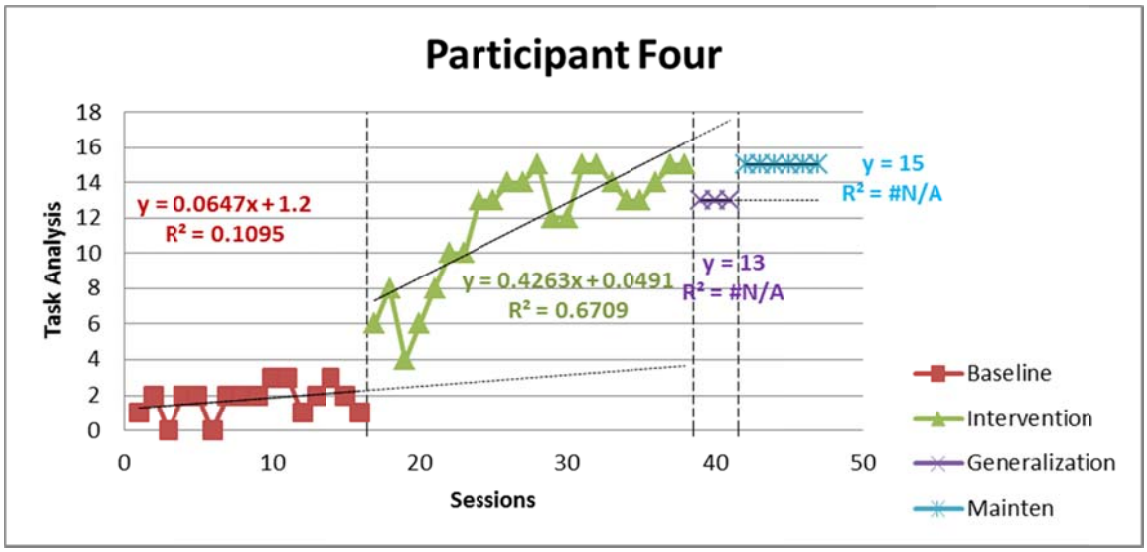

Figure 6. Participant 4's data across phases.

Baseline phase. Participant 4 did not meet academic content standards set by the researcher and based on the ALSDE AAA rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2009) during the baseline phase of the study, averaging 1.8 correct independent responses with an estimated starting point of 1.3 and endpoint of 2.2 correct independent responses (*SD* = .93, range [0, 3]; see Figure 6).

During baseline, Participant 4 routinely had independent correct responses to attend to materials, focus on objects, and answer yes or no to "do you want to read the book again?" Participant 4 responded correctly to various steps on the task analysis (i.e., choose a book, react to surprise, and answer what the story was about using prediction objects). Participant 4 struggled with attend to book, predict what the story is about using objects, react to name, and complete a storyline.

The trend line estimated that Participant 4 would have obtained a score of 3.7 (does not meet expectations; Morton, 2006) without intervention. In this instance, during the baseline phase of the study, the projected trend line indicated that Participant 4 would have obtained a score of 3.7 for baseline during shared story reading. Therefore, presumably at the end of intervention on day 38, the participant's projected score would be a 3.7 on the task analysis even with no intervention, which does not meet ALSDE extended content standards (Morton), because it falls below the 25th percentile.

Intervention phase. Participant 4 exceeded the ALSDE extended standards for academic content standards (Morton, 2006) during the intervention phase of the study. Participant 4 averaged 11.8 correct independent responses (*SD* = 3.4 range [4, 15]). Comparing the average independent correct responses during intervention to the average during baseline revealed an overall increase of 62.5%, an increase of 10 independent correct responses from baseline to intervention.

During the initial phase of intervention, Participant 4 routinely had independent correct responses to choose a book, attend to book, attend to materials, predict what the story is about, react to surprise element, and answer yes or no to the question "do you want to read the story again?" Participant 4 responded correctly to various steps of the task analysis (i.e., complete storyline, and answer what was the story about using prediction objects). Participant 4 struggled with independent responses to react to name, answer what the story was about using prediction objects, and focus on objects.

Participant 4 obtained five scores of 15 during the 22 days of intervention. On days 12, 15, 16, 21, and 22, Participant 4 had independent correct responses to choose a book, attend to a

book, attend to materials, predict what the book is about, focus on objects when named and displayed, react to name embedded in the story (when presented two times), complete a storyline, react to surprise, answer what the story was about using prediction objects, and answer yes or no to the question “do you want to read the story again?” Participant 4 responded to his name twice, but did not react to his name embedded within the story on one occasion.

The estimated trend line for the intervention phase produced an initial estimated score of 7.3 correct independent responses and a daily rate of change of +0.43 independent correct responses. This estimate produced an estimated score of 16 (see Footnote 1) at the end of the intervention, an increase of 54.4% from the start of the intervention. Comparing the difference between the estimates from the trend lines at the end of baseline (2.2) with the beginning of intervention (7.3) was an increase of 5.1 independent correct responses, demonstrating a 31.8% increase from baseline to intervention. These results demonstrated that the intervention produced a higher number of initial correct independent responses than baseline.

Comparing the difference between the estimates from the trend line at the end of intervention (16; see Footnote 1) against the estimated values using the baseline trend line (3.7), revealed a difference of 12.3 independent correct responses, an increase of 76.9% for intervention over baseline. These results demonstrated that the intervention produced a higher daily rate of change in the number of correct independent responses. Taken together, these data revealed that intervention produced a predicted daily rate of change in obtaining independent correct responses that was more than seven times that of baseline.

Generalization phase. Participant 4 continued to exceed the ALSDE extended standards for academic content standards (Morton, 2006; Quenemoen et al., 2010) during the

generalization phase of the study, averaging 13 independent correct responses (*SD* = 0.0, range [13, 13]). Comparing this value to the average during intervention revealed an overall increase of 7.5 % or 1.2 independent correct responses.

Participant 4 consistently scored a 13 during the 3 days of the generalization phase. Participant 4 routinely had independent correct responses to choose a book, attend to book, attend to materials, predict what the book is about, focus on objects, complete storyline, react to surprise, answer what was the story about using prediction objects, and answer yes or no to the question "do you want to read the story again?" As in previous phases, Participant 4 continued to struggle with reacting to name embedded within the story.

The estimated trend line for the generalization phase produced an initial estimated score of 13 correct independent responses and a daily rate of change of 0.0 correct independent responses. This estimate produced an estimated score of 13 at the end of generalization, an increase of 0.0% from the start of the generalization. Comparing the difference between the estimates from the trend lines at the end of intervention (16; see Footnote 1) with the beginning of generalization (13) is a decrease of 3 independent correct responses, demonstrating an 18.7% decrease from intervention to generalization. These results demonstrated that generalization produced a lower number of initial independent correct responses than intervention, but Participant 4 still exceeded ALSDE extended standards.

Comparing the difference between the estimates from the trend line at the end of generalization (13) against the estimated values using the intervention trend line (16; see Footnote 1), revealed a difference of 3 correct independent responses, a decrease of 18.7% from intervention to generalization. These results demonstrated that the generalization produced a lower daily rate of change in the number of correct independent responses. Although lower than

the intervention phase, Participant 4 still exceeded ALSDE extended standards during all points of the generalization phase. Participant 4's results indicated that previous learning during intervention was transferred to new reading material during the generalization phase.

Maintenance phase. Participant 4 exceeded the ALSDE extended standards for academic content standards (Morton, 2006; Quenemoen et al., 2010) during the maintenance phase of the study. Participant 4 averaged 15 correct independent responses (*SD* = .0.0, range [15, 15]). Comparing this value to the average during generalization revealed an overall increase of 12.5%, equal to 2 independent correct responses.

During the maintenance phase, Participant 4 routinely had independent correct responses to choose a book, attend to book, attend to materials, predict what the book is about, focus on objects, complete storyline, react to surprise, and answer yes or no to the question, "do you want to read the story again?" Participant 4 struggled with independent correct responses to reacting to name embedded within the story and to answering what was the story about using prediction objects. As with previous phases of the study, Participant 4 struggled with react to name embedded within a story during this phase.

The estimated trend line for the maintenance phase produced an initial estimated score of 15 correct independent responses and a daily rate of change of 0 correct independent responses. This estimate produced a score of 15 at the end of maintenance, an increase of 12.5% from generalization. Comparing the difference between the estimates from the trend lines at the end of generalization (13) with the beginning of maintenance (15) was an increase of 2 independent correct responses, demonstrating a 12.5% increase from generalization to maintenance. These

results demonstrated that the maintenance phase produced a higher number of initial correct independent responses than the generalization phase.

Comparing the difference between the estimates from the trend line at the end of maintenance (15) against the estimated values using the projected generalization (13), revealed a difference of 2 independent correct responses, which is an increase of 12.5% for maintenance over generalization. Although, these results demonstrated that maintenance produced an analogous daily rate of change (0.0) in the number of correct independent responses, the data indicated an overall increase in independent correct responses. More importantly, the maintenance phase demonstrated that Participant 4 continued to exceed ALSDE extended content standards after the intervention and generalization phases of the study, increasing the likelihood that these changes are enduring.

Trend line analysis. The results of this study suggested that Participant 4 demonstrated an overall increase in the number of independent correct responses during intervention. Although some regression was noted in the trend line during generalization and maintenance, the data indicated that once UDL was implemented the participant's progress was maintained throughout the study. The average number of independent correct responses was 11.8 for intervention, increased to 13.0 for the generalization phase, and demonstrated an additional increase of 15.0 for the maintenance phase of the study. Initially during the baseline phase, Participant 4 did not meet extended academic content standards, but met extended standards during intervention. Participant 4 continued to make progress enabling him to exceed extended standards during the generalization and maintenance phases of the study. The data indicated that once the UDL components with shared story reading were employed Participant 4 was able to generalize these

techniques into other situations. That is, the skills learned by Participant 4 were not an isolated occurrence, but were enduring, lasting through generalization and maintenance. Simply stated, shared story reading was highly effective for Participant 4 (see Figure 6).

Implementation of UDL techniques. Participant 4 communicated by physically directing adults to desired object and would use some words when prompted. According to the classroom teacher, he enjoyed reading words and pictures symbols. Participant 4 would repeat words and phrases spoken to him but it was difficult even for familiar personnel to understand him. This was due to the fact that Participant 4 did not close his mouth properly to make the appropriate sounds. It was noted that Participant 4 used his tongue as a stimulating activity, which resulted in loss of focus on target activities and excessive drooling.

During baseline, Participant 4 periodically appeared frightened of dolls and stuffed animals. During shared story reading as the researcher presented related objects, Participant 4 occasionally would jump up and run from group so objects were present at knee level. After the team meetings, the members decided that AAC techniques and devices (i.e., 7-level CommuniBuilder) would be added for the intervention phase. The team was of the opinion that this form of intervention would augment the participant's ability and confidence to increase independent correct responses.

An additional planning meeting was conducted during which the speech teacher, classroom teacher, and researcher agreed Participant 4 could communicate using sentence strips with picture symbols as a reminder to vocalize the repeated storyline of the shared story. The team also decided that a voice output device would be available for Participant 4 to use when his speech patterns were unintelligible. In an attempt to decrease tongue stimulating activity,

Participant 4 would have his mouth dried or wiped with a towel. During shared story reading, the researcher reminded Participant 4 to focus and select one of the presented objects to respond to the questions that were listed on the task analysis.

Participant 5

At the onset of the study, Participant 5's scores on the *Task Analysis for Shared Stories* (see Appendix A) did not meet the academic content standards as set by the researcher and based on the ALSDE AAA rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2010). Through shared story reading in a small group format, Participant 5 demonstrated an increase in the total number of independent correct responses on the task analysis between baseline and intervention phases, and exceeded extended standards for academic content during the intervention. Furthermore, Participant 5 continued to exceed the extended standards for academic content during the generalization and maintenance phases of the study. The results are explained in detail below and visually represented (see Figure 7).

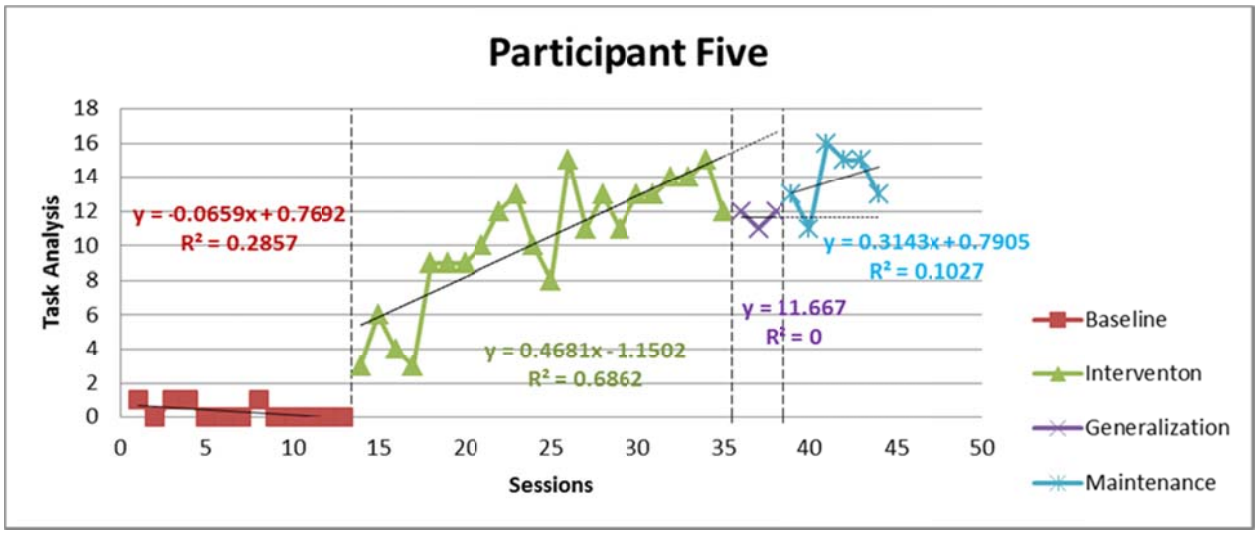

Figure 7. Participant 5's data across phases.

Baseline phase. Participant 5 did not meet academic content standards set by the ALSDE (Morton, 2006; Quenemoen et al., 2010) during the baseline phase of the study, averaging .31 correct independent responses with an estimated starting point of .70 and endpoint of 0.0 (see Footnote 2) correct independent responses (*SD* = .48, range [0, 1]; see Figure 7).

During baseline, Participant 5 routinely had independent correct responses to react to name embedded within the story for the 13 baseline sessions. Participant 5 reacted to name once per session during baseline. Participant 5 struggled with incorrect or no responses to choose a book, attend to a book, attend to materials, predict what the story is about, focus on objects, complete a storyline, react to surprise, answer the question what was the story about using the prediction objects, and answer yes or no to "do you want to read the story again?"

The trend line estimated that Participant 5 would have obtained a score of 0 (see Footnote 2; does not meet expectations) without intervention. In this instance, during the baseline phase of the study the projected trend line indicated that Participant 5 would have obtained a score of 0.0 (see Footnote 2) for baseline during shared story reading. Therefore, presumably at the end of intervention on day 35, the participant's projected score would be a 0.0 (see Footnote 2) on the task analysis even with no intervention, which does not meet ALSDE extended content standards, because it falls below the 25th percentile.

Intervention phase. Participant 5 exceeded the ALSDE extended standards for academic content standards (see Appendix H; Morton, 2006; Quenemoen et al., 2010) during the intervention phase of the study. Participant 5 averaged 10.3 correct independent responses (*SD* = 3.7, range [3, 15]). Comparing the average independent correct responses during intervention to

the average during baseline revealed an overall increase of 62.5%, an increase of 10 correct responses from baseline to intervention.

Initially during the intervention phase, Participant 5 routinely had independent correct responses to choose a book, predict what the story is about, complete a storyline, and answer yes or no to “do you want to read the book again?” Participant 5 responded correctly to attend to materials, focus on objects, react to surprise, and answer the question what was the story about using prediction objects. During intervention, Participant 5 struggled with reacting to name and attending to book.

Participant 5 obtained two scores of 15 independent correct responses during the 22 days of intervention. Participant 5 had independent correct responses to choose a book, attend to a book, attend to materials, predict what the book was about, complete a storyline, react to surprise element, and answer yes or no to “do you want to read the story again?” Participant 5 had one incorrect or no response for one of the three presentations on which these steps were presented: reacting to name and focus on objects when named and displayed.

The estimated trend line for the intervention phase produced an initial estimated score of 5.4 correct independent responses and a daily rate of change of +0.47 independent correct responses. This estimate produced an estimated score of 15.2 at the end of intervention, an increase of 61.2% from the start of the intervention. Comparing the difference between the estimates from the trend lines at the end of baseline (0.0; see Footnote 2) with the beginning of intervention (5.4) was an increase of 5.4 independent correct responses, demonstrating a 33.8% increase from baseline to intervention. These results demonstrated that the intervention produced a higher number of initial correct independent responses than baseline.

Comparing the difference between the estimates from the trend line at the end of intervention (15.2) against the estimated values using the baseline trend line (0.0; see Footnote 2), revealed a difference of 15.2 independent correct responses; an increase of 95% for intervention over baseline. These results demonstrated that the intervention produced a higher daily rate of change in the number of correct independent responses. Taken together, these data revealed that intervention produced a predicted daily rate of change inverse to baseline and an increase of .54 independent correct responses.

Generalization phase. Participant 5 continued to exceed the ALSDE extended standards for academic content standards (Morton, 2006; Quenemoen et al., 2010) during the generalization phase of the study, averaging 11.7 independent correct responses (*SD* =.58, range [11, 12]). Comparing this value to the average during intervention revealed an overall increase of 8.7%, which were 1.4 independent correct responses.

During the generalization phase, Participant 5 routinely had independent correct responses to choose a book, attend to book, attend to materials, predict what the story is about, focus on objects, complete storyline, answer what was the story about using prediction objects, and answer yes or no to “do you want to read the book again?” Participant 5 struggled with react to name embedded within the story during all three sessions. Participant 5 answered incorrectly or provided no response to react to name, surprise element, and focus on object for one of three presentations.

The estimated trend line for the generalization phase produced an initial estimated score of 11.7 correct independent responses and a daily rate of change of 0.0 correct independent responses. This estimate produced an estimated score of 11.7 at the end of generalization, an

increase of 0.0% from the start of generalization. Comparing the difference between the estimates from the trend lines at the end of intervention (15.2) with the beginning of generalization (11.7) is a decrease of 3.5 independent correct responses, demonstrating a 21.9% decrease from intervention to generalization. These results demonstrated that generalization produced a lower number of initial independent correct responses than intervention, but Participant 5 still exceeded ALSDE extended standards.

Comparing the difference between the estimates from the trend line at the end of generalization (11.7) against the estimated values using the projected intervention trend line (16) (see Footnote 1) revealed a difference of 4.3 correct independent responses, a decrease of 26.9% from intervention to generalization. These results demonstrated that the generalization produced a lower daily rate of change in the number of correct independent responses. Although lower than the intervention phase, Participant 5 still exceeded ALSDE extended standards during all points of the generalization phase. Participant 5 demonstrated that previous learning during intervention was transferred to new reading material during the generalization phase.

Maintenance phase. Participant 5 exceeded the ALSDE extended standards for academic content standards (Morton, 2006; Quenemoen et al., 2010) during the maintenance phase of the study. Participant 5 averaged 13.8 correct independent responses (*SD* = 1.8, range [11, 16]). Comparing this value to the average during generalization revealed an overall increase of 13.2%, which was equal to 2.1 independent correct responses.

Participant 5 obtained 16 independent correct responses during one of six sessions in the maintenance phase of the study. For three sessions, Participant 5 had independent correct responses to choose a book, attend to book, attend to materials, predict what the story is about,

focus on objects, complete storyline, react to surprise element (except session 4), answer what was the story about using prediction objects, and answer yes or no to “do you want to read the book again?” Participant 5 struggled with independent correct responses to react to name all three times. For one session, Participant 5 had incorrect responses or no responses to complete a storyline, react to name embed in the story three times, and answer what was the story about using prediction objects one time.

The estimated trend line for the maintenance phase produced an initial estimated score of 13 correct independent responses and a daily rate of change of .31 correct independent responses. This estimate produced a score of 14.6 at the end of maintenance, an increase of 10% from generalization. Comparing the difference between the estimates from the trend lines at the end of generalization (11.7) with the beginning of maintenance (13) was an increase of 1.3 independent correct responses, demonstrating an 8.2% increase from generalization to maintenance. These results demonstrated that the maintenance phase produced a higher number of initial correct independent responses than generalization.

Comparing the difference between the estimates from the trend line at the end of maintenance (14.6) against the estimated values using the projected generalization (11.7), revealed a difference of 2.9 independent correct responses, which is an increase of 18.2% for maintenance over generalization. These results demonstrated that maintenance produced a higher daily rate of change (+.31) in the number of independent correct responses, as well as an overall increase in independent correct responses. More importantly, the maintenance phase demonstrated that Participant 5 continued to exceed ALSDE extended content standards after the intervention and generalization phases of the study, increasing the likelihood that these changes are enduring.

Trend line analysis. The results of this study suggested that Participant 5 demonstrated an overall increase in the number of independent correct responses during intervention. Although some regression was noted on the trend line during generalization and maintenance, the data indicated that once UDL was implemented the participant's progress was maintained throughout the study. The average number of independent correct responses was 10.3 for intervention, increased to 11.7 for the generalization phase, and demonstrated an additional increase of 13.8 for the maintenance phase of the study. Initially during the baseline phase, Participant 5 did not meet extended academic content standards, but met extended standards during intervention and generalization. Participant 5 continued to make progress enabling him to exceed extended standards during the maintenance phase of the study. The data indicated that once the UDL components were employed, Participant 5 was able to generalize these techniques into other situations. That is, the skills learned by Participant 5 were not an isolated occurrence, but were enduring, lasting through generalization and maintenance. Simply stated, shared story reading was highly effective for Participant 5 (see Figure 7).

Implementation of UDL techniques. Participant 5 was considered nonverbal but had the capacity to communicate using a BigMac communication device (i.e., single recorded message of 30 seconds). He accomplished this task by auditory scanning choices with 2-second pauses between selections and facial expressions. Participant 5 was presented with two choices each, which were presented verbally by the researcher, teacher, paraprofessionals, or classmates with a 2-second delay between choices. The choices of response were presented verbally followed by two claps by the researcher, teacher, paraprofessional, and/or classmates. During the 2-second

interval, Participant 5 would activate the BigMac, which was preprogrammed with the message "that's it," to make his selection. This method was used during all phases of the study.

During baseline, Participant 5 attempted to fake sleeping in order to not participate but was easily redirected by the researcher. After the team meetings, the AAC device was continued for the intervention phase with additional messages programmed during the reading activity, in an effort to facilitate more interactions. During the intervention phase of the study, the message on Participant 5's BigMac was altered from "that's it" to the repeated storyline. This allowed Participant 5 to actually interact by completing the repeated the storyline. The team used both the voices of the teacher and a classmate to determine whether this would increase the response rate of Participant 5. Participant 5 did not appear that have a preference to a particular voice; subsequently, there was no discernible difference in the response rate.

An additional meeting was conducted during which the speech teacher, classroom teacher, and researcher agreed that Participant 5 could communicate or indicate focusing by facial expression or head movement when objects were associated with sound, smell, or texture. For example when the story was discussing clothing, a soft textured mitten was rubbed across Participant 5's arm and cheek. During shared story reading, the researchers presented objects and named them for prediction and comprehension. Participant 5 employed auditory scan to select one of the presented objects in response to the questions that were listed on the task analysis.

Participant 6

At the onset of the study, Participant 6's score on the *Task Analysis for Shared Stories* (see Appendix A) did not meet the academic content standards as set by the researcher and based on the ALSDE AAA rubric (see Appendix H; Morton, 2006; Quenemoen et al., 2010). Through

shared story reading in a small group format. Participant 6 demonstrated an increase in the total number of independent correct responses on the task analysis between the baseline and intervention phases, and exceeded extended standards for academic content during the intervention. Furthermore, Participant 6 continued to exceed the extended standards for academic content during the generalization and maintenance phases of the study. The results are explained in detail below and visually represented (see Figure 8).

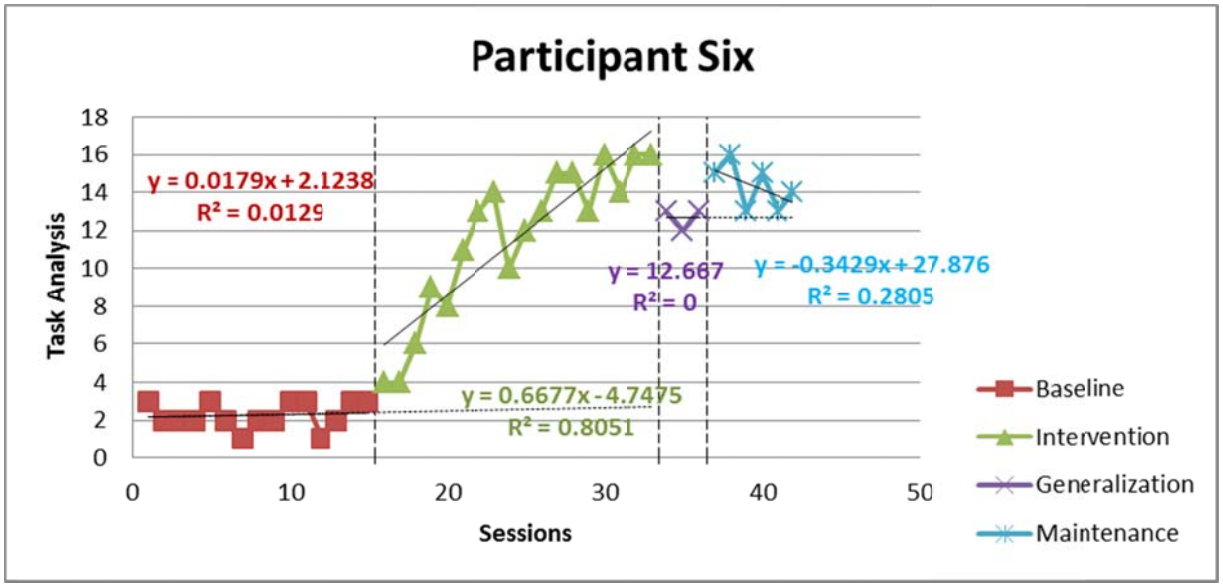

Figure 8. Participant 6's data across phases.

Baseline phase. Participant 6 did not meet academic content standards set by the ALSDE (see Appendix H; Morton, 2006; Quenemoen et al., 2010) during the baseline phase of the study, averaging 2.3 correct independent responses with an estimated starting point of 2.1 and endpoint of 2.4 correct independent responses (*SD* = .70, range [1, 3]; see Figure 8).

During baseline, Participant 6 routinely had independent correct responses to choose a book, attend to materials, and answer yes or no to "do you want to read the book again?"

Participant 6 also had independent correct responses to attend to book, react to name, focus on object one time during story, and react to surprise; however, this ability was inconsistent throughout the baseline phase of the study. Participant 6 struggled with independent correct responses for predicting what the story is about, completing storyline, and answering what the story was about using prediction objects.

The trend line estimated that Participant 6 would have obtained a score of 2.7 (does not meet expectations) without intervention. In this instance, during the baseline phase of the study the projected trend line indicated that Participant 6 would have obtained a score of 2.7 for baseline during shared story reading. Therefore, presumably at the end of intervention on day 33 the participant's projected score would be a 2.7 on the task analysis even with no intervention, which does not meet ALSDE extended content standards, because it falls below the 25th percentile.

Intervention phase. Participant 6 exceeded the standards set by the researcher and based on the ALSDE extended standards for academic content standards (see Appendix H; Morton, 2006; Quenemoen et al., 2010) during the intervention phase of the study. Participant 6 averaged 11.6 correct independent responses (*SD* = 4, range [4, 16]). Comparing the average independent correct responses during intervention to the average during baseline revealed an overall increase of 58.1%, an increase of 9.3 correct responses from baseline to intervention.

During the initial phase of intervention, Participant 6 routinely had independent correct responses to attend to book, attend to materials, predict what the book is about, focus on objects, react to surprise element, and answer yes or no to "do you want to read the book again?" Participant 6 had inconsistent independent correct responses to choose a book and complete

storyline for one time. Participant 6 struggled with independent correct responses to react to name, answer what the book was about using prediction objects, and complete storyline three times during a session.

Participant 6 obtained a score of 16 independent correct responses for 3 of the 18 days of intervention. On days 15, 17, and 18, Participant 6 had independent correct responses to all of the steps on the task analysis (i.e., to choosing a book, attending to a book, attending to materials, predicting what the book was about, reacting to name three times, focusing on objects when named and displayed, completing a storyline, reacting to surprise element, and answering yes or no to "do you want to read the story again?" see Appendix A). Participant 6 struggled with independent correct responses on react to name, and answer the question what was the story about using prediction items.

The estimated trend line for the intervention phase produced an initial estimated score of 5.9 correct independent responses and a daily rate of change of +0.67 independent correct responses. This estimate produced an estimated score of 16 (see Footnote 1) at the end of intervention, an increase of 63.1% from the start of the intervention. Comparing the difference between the estimates from the trend lines at the end of baseline (2.4) with the beginning of intervention (5.9) was an increase of 3.5 independent correct responses, demonstrating a 21.9% increase from baseline to intervention. These results demonstrated that the intervention produced a higher number of initial correct independent responses than baseline.

Comparing the difference between the estimates from the trend line at the end of intervention (16; see Footnote 1) against the estimated values using the projected baseline trend line (2.7), revealed a difference of 13.3 independent correct responses, an increase of 83.1% for intervention over baseline. These results demonstrated that the intervention produced a higher

daily rate of change in the number of correct independent responses. Taken together, these data revealed that intervention produced a predicted daily rate of change in obtaining independent correct responses that was more than 30 times that of baseline.

Generalization phase. Participant 6 continued to exceed the ALSDE extended standards for academic content standards (see Appendix H; Morton, 2006; Quenemoen et al., 2010) during the generalization phase of the study, averaging 12.7 independent correct responses (*SD* = .58, range [12, 13]). Comparing this value to the average during intervention revealed an overall increase of 6.9%, which equals 1.1 independent correct responses.

During generalization, Participant 6 had independent correct responses to choose a book, attend to book, attend to materials, predict what the book is about, focus on objects, complete storyline, react to surprise, answering what the story was about using prediction objects, and answer yes or no to “do you want to read the story again?” Participant 6 struggled with independent correct responses to react to name embedded within the story.

The estimated trend line for the generalization phase produced an initial estimated score of 12.7 correct independent responses and a daily rate of change of 0.0 correct independent responses. This estimate produced an estimated score of 12.7 at the end of generalization, an increase of 0.0% from the start of the generalization. Comparing the difference between the estimates from the trend lines at the end of intervention (16; see Footnote 1) with the beginning of generalization (12.7) is a decrease of 3.3 independent correct responses, demonstrating a 20.6% decrease from intervention to generalization. These results demonstrated that generalization produced a lower number of initial independent correct responses than intervention, but Participant 6 still exceeded ALSDE extended standards.

Comparing the difference between the estimates from the trend line at the end of generalization (12.7) against the estimated values using the projected intervention trend line (16; see Footnote 1), revealed a difference of 3.3 correct independent responses, a decrease of 20.6% from intervention to generalization. These results demonstrated that the generalization produced a lower daily rate of change in the number of correct independent responses. Although lower than the intervention phase, Participant 6 still exceeded ALSDE extended standards during all points of the generalization phase. Participant 6 demonstrated that previous learning during intervention was transferred to new reading material during the generalization phase.

Maintenance phase. Participant 6 exceeded the extended standards for academic content standards (see Appendix H; Morton, 2006; Quenemoen et al., 2010) during the maintenance phase of the study. Participant 6 averaged 14.3 correct independent responses (*SD* = 1.2, range [13, 16]). Comparing this value to the average during generalization revealed an overall increase of 10% (1.6) independent correct responses.

Participant 6 obtained a score of 16 independent correct responses (i.e., choose a book, attend to book, attend to materials, predict what the book is about, focus on objects, complete storyline, react to name embedded within the story, react to surprise, answering what the story was about using prediction objects, and answering yes or no to “do you want to read the story again?”) during one of six sessions of the maintenance phase. For one session, Participant 6 had independent correct responses to choose a book, attend to book, attend to materials, predict what the book is about, complete a storyline, react to name embedded within the story, react to surprise element, answer what the story was about using prediction objects, and answer yes or no to “do you want to read the story again?” Participant 6 correctly responded to focus on objects

for two of three presentations. For three sessions, Participant 6 had independent correct responses to choose a book, attend to book, attend to materials, predict what the book is about, focus on objects, complete storyline, react to surprise, and answer yes or no to “do you want to read the story again?” Participant 6 struggled with reacting to name embedded in the story for two of three attempts and incorrectly responded to answering what the story was about using prediction objects.

The estimated trend line for the maintenance phase produced an initial estimated score of 15.2 correct independent responses and a daily rate of change of -.34 correct independent responses. This estimate produced a score of 13.5 at the end of maintenance, a decrease of 10.6% from generalization. Comparing the difference between the estimates from the trend lines at the end of generalization (12.7) with the beginning of maintenance (15.2) was an increase of 2.5 independent correct responses, demonstrating a 15.6 % increase from generalization to maintenance. These results demonstrated that the maintenance phase produced a higher number of initial correct independent responses than the generalization phase.

Comparing the difference between the estimates from the trend line at the end of maintenance (13.5) against the estimated values using the projected generalization (12.7), revealed a difference of .8 independent correct responses, which is an increase of 5% for maintenance over generalization. Although, these results demonstrated that maintenance produced a lower daily rate of change (-.34) in the number of correct independent responses, the data indicated an overall increase in independent correct responses. More importantly, the maintenance phase demonstrated that Participant 6 continued to exceed ALSDE extended content standards after the intervention and generalization phases of the study, increasing the likelihood that these changes are enduring.

Trend line analysis. The results of this study suggested that Participant 6 demonstrated an overall increase in the number of independent correct responses during intervention. Although some regression was noted in the trend line during generalization and maintenance, the data indicated that once UDL was implemented, the participant's progress was maintained throughout the study. The average number of independent correct responses was 11.6 for intervention, increased to 12.7 for the generalization phase, and demonstrated an additional increase of 14.3 for the maintenance phase of the study. Initially during the baseline phase, Participant 6 did not meet extended academic content standards, but met extended standards during intervention. Participant 6 continued to make progress, enabling him to exceed extended standards during the generalization and maintenance phases of the study. The data indicated that once the UDL techniques were employed, Participant 6 was able to generalize these techniques into other situations. That is, the skills learned by Participant 6 were not an isolated occurrence, but are enduring, lasting through generalization and maintenance. Simply stated, shared story reading was highly effective for Participant 6 (see Figure 8).

Implementation of UDL techniques. Participant 6 was considered nonverbal, with only 3 to 5 words that could be easily understood. The teacher indicated that the use of picture symbols had been questionable in the past, secondary to visual problems and her becoming overly excited. During the study, Participant 6's mother took her to an optometrist to obtain corrective lenses, which corrected the vision problems. During base line, Participant 6 remained overly excited when presented with picture symbols or objects, wanting to maintain possession of these objects. It appeared that this form of behavior was her way of interacting with the tasks. She

appeared to have a more highly developed receptive vocabulary. This was evident secondary to the participant comprehending and following specific steps associated with routine tasks.

During intervention, Participant 6 made approximations of the repeated storyline words and appeared excited when she responded to the steps of task analysis. After the team meetings, AAC techniques and devices (i.e., SuperTalker) were continued for the intervention phase in an effort to facilitate interactions. An additional meeting was conducted during which the speech teacher, classroom teacher, and researcher agreed Participant 6 would require verbal and visual reminders to use one hand (e.g., participant would give a high five prior to the command to use one hand). During shared story reading, the researcher asked for a high five then asked the participant to choose the objects to answer the questions that were listed on the task analysis. Toward the end of the study, Participant six was making approximations of the repeated storyline with the correct intonation and syllables.

Aggregate

When comparing the aggregate of averages among baseline, the data indicated that the number of independent correct responses was 1.3 with a daily rate of change of 0. The aggregate response rate for the intervention phase was 11.3 independent correct responses. This is an increase of 62.5% or 10 independent correct responses over base line. The aggregate response rate for generalization was 12.8 independent correct responses, which represents an increase of 9.4% or 1.5 independent correct responses. The aggregate response rate for maintenance was 14.8 independent correct responses. This represents an increase of 12.5% or 2 independent correct responses. The data demonstrated that the number of correct independent responses increased during each phase of the study. Because the increases in correct responses occurred

among all six students in an analogous manner, this suggested that the increases in independent correct responses were a function of the UDL components and not associated with some extraneous phenomena. Furthermore, the data demonstrated that the increases in independent correct responses were maintained during a generalization phase. This suggested that once the UDL components were employed with shared story reading, all six participants were able to turn previously learned strategies into novel learning experiences. The maintenance phase of the study demonstrated that previous learning was not forgotten but endured over time. That is, the skills learned by all six participants were not an isolated occurrence, but both generalized and persisted. Simply stated, shared story reading was highly effective for all six participants (see Figure 9).

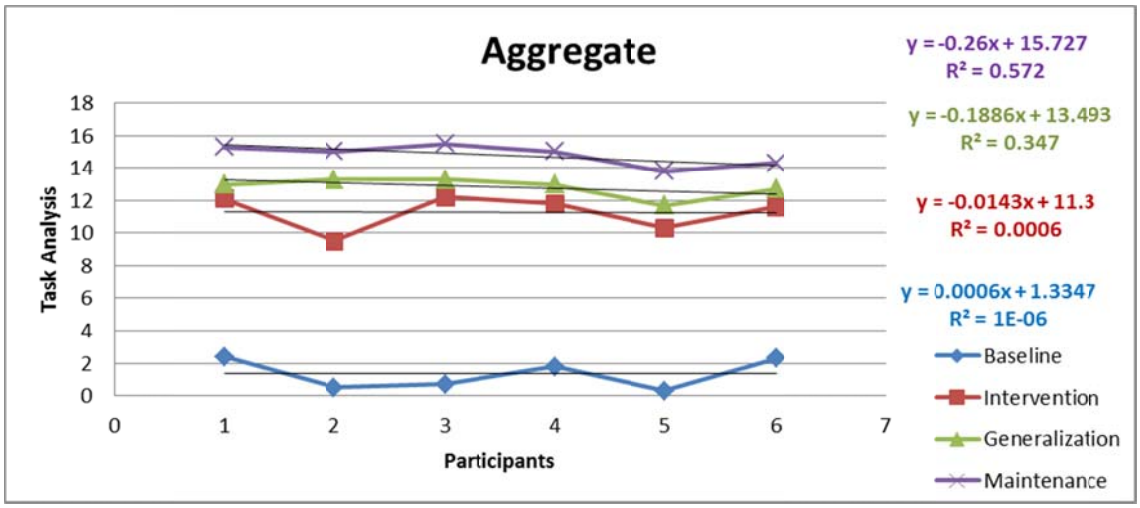

Figure 9. Aggregate scores for participants across phases.

Summary

In line with single subject research design, numeric and graphical summaries of the data collected during baseline were utilized to assess and demonstrate a trend (Kazdin, 1982). For this

study, visual analysis was utilized to analyze the results. Chapter 4 presented the data collected during the study. Results were presented as follows. Initially, all six of the participants were categorized as not meeting extended standards for academic content. During the intervention phase, two of the participants were categorized as exceeding extended standards for academic content, while the other four participants were categorized as meeting extended standards for academic content areas. The generalization phase had five of the six participants categorized as exceeding extended standards for academic content. In the final phase, maintenance, all six of the participants were categorized as exceeding extended content standard for academic content. Overall, the small group format for shared story reading with UDL techniques was a productive setting for students with severe and multiple disabilities.

Intervention goals contributed to the efficacy research of shared story reading, AAC use, and intraverbal training. A general goal of this type of intervention was to include and increase the literacy interaction of the participants (Bedrosian, 1999; Browder, Mims, et al., 2008; Light, 1997). The explicit goals during the intervention phase of shared story reading were for the participants to use picture symbols or objects to make choices (e.g., concerning the book to read and whether they want to hear it again) and activating a voice output device (e.g., complete a repeated storyline; Bedrosian, 1999; Browder, Mims, et al., 2008). Other objectives were for the participants to activate an AAC device, choose a picture symbol on a communication board, or select individual symbols to answer questions related to the story during literacy instruction (Bedrosian; Browder, Mims, et al.). Upon completion of the intervention, a desired outcome was for the participants to generalize the ability to communicate into their environment in a manner which augments interaction among community members (Durand, 1999; Goldsmith, LeBlanc, & Sautter, 2007).

Chapter 5 will provide the researcher's interpretation of the data presented in chapter four. Data for each research question will be examined and further implications of the data will be discussed in chapter 5. Implications for further research pertaining to shared story reading and the implementation of UDL also will be addressed in chapter 5.

CHAPTER 5

DISCUSSION AND RECOMMENDATIONS

According to the No Child Left Behind Act (2001) and The Individuals with Disabilities Education Improvement Act (2004), students with significant cognitive disabilities should receive a highly qualified education toward the general education curriculum and be assessed on general education standards. Both NCLB and IDEA set forth guidelines and standards for assessing these goals, for participation in the curriculum, and research-based practices. Therefore, intervention strategies to facilitate progress toward these objectives are a critical component in complying with these mandates for individuals with significant cognitive disabilities.

The primary purpose of the study was to examine the effects of planning meetings utilizing UDL prior to teaching literacy lessons using shared stories for students with severe and multiple disabilities. Building on the Browder, Mims, et al. (2008) study, this study addressed two of the limitations mentioned in the study. One being, would the students be able to acquire independent correct responses when instruction was provided in a small group format in a self-contained class? The second limitation addressed the necessity for follow-up phases (i.e., maintenance and generalization) data to be collected in order to strengthen the previous research. The results demonstrated that during small group instruction the participants obtained increased independent correct response as measured on a task analysis, generalized the new skills to novel materials, and maintained previously learned skills over time to obtained increases in

independent correct responses. In addition, participants actually continued to demonstrate increases in independent correct responses when the material was reintroduced.

The current study adds to the literature promoting shared story reading as an effective technique to teach literacy and skills that address extended standards of academic content to students with severe and multiple disabilities. Various studies involving students with severe and/or multiple disabilities have used shared story reading to demonstrate comprehension and increased interaction (Blyden, 1998; Browder et al., 2007; Browder, Mims, et al., 2008; Koppenhaver, Erickson, & Skotko, 2001; Mims, Browder, Baker, Lee, & Spooner, 2009), increased skills such as attentiveness (Bellon-Harn & Harn 2008; Stephenson, 2009), use of devices, and enjoyment (Browder, Ahlgrim-Delzell, Courtade, Gibbs, & Flowers, 2008; Koppenhaver, Erickson, Harris, et al., 2001; Skoto, Koppenhaver, & Erickson, 2004). This study was an extension of Browder, Mims, et al. (2008) study in that it used generalization and maintenance phases with the study and also employed a small group format to instruct students with severe and multiple disabilities using UDL components. This study is consistent with previous research in that it promotes the ability of the participants to learn target literacy skills (Browder, Mims, et al., 2008). In this study the steps of the task analysis were matched with the reading extended standards, which are evidence for the AAA (see Appendix A). A discussion of the findings of this study will be addressed below starting with data relating to the research questions. Afterwards, a discussion of the limitations of the research will be addressed. Suggestions for additional research and implications for practice will conclude this chapter.

Research Questions

1. What are the effects of the components of UDL on the number of independent correct responses for students in small group instruction to progress through a shared story as measured by the task analysis? (P. Mims, personal communication, January 6, 2010).

2. To what extent does the team planning process to individualize instruction generalize to shared story reading with a different book as measured by the task analysis? (P. Mims, personal communication, January 6, 2010).

3. What are the effects of the components of UDL on students' ability to maintain independent correct responses during small group instruction to progress through a shared story as measured by the task analysis? (P. Mims, personal communication, January 6, 2010).

Incorporating the task analysis developed by Browder, Mims, et al. (2008) into this study validated the measure; the researcher further validated the task analysis by matching each step to the Alabama extended standards for elementary reading (Morton, 2006). The steps of the task analysis relate to the lowest complexity level for the reading extended standards (see Appendix A) for several elementary grades. Since all of the participants' met the ALSDE eligibility criteria for severe mental disability (Morton, 2009) the researcher determined that complexity level one reading extended standards were considered developmentally appropriate and challenging for this population.

Complexity level one reading extended standards are associated with the 25th percentile; therefore, it should be understood that mastery of these standards will not allow the participants to achieve a passing score on the AAA (Morton, 2011). However, in the event an intervention is successful in facilitating mastery of complexity level one, then the implementation of additional strategies to target more complex skills could facilitate higher scores on the AAA. In this study,

the majority of participants reached or approached the ceiling effect, which suggested that development of a task analysis to measures higher complexity level skills needs to be addressed. This study suggested that students who have appropriate instructional strategies, which include scaffolding skills and AAC, demonstrated increases in both interaction and engagement. The current trend suggested that planning with UDL components for higher complexity level reading extended standards has the capacity to increase reading scores on the AAA, which in turn would increase adequate yearly progress (AYP) scores for the individual schools and district.

Discussion

Research Question 1

The first question examined the effects of UDL components on the number of independent correct responses for students with severe and multiple disabilities. To investigate the effects of UDL components, the participants were exposed to shared story reading in small group instruction. The degree of improvement each participant demonstrated to progress through shared story reading was measured on a task analysis. When participants engaged in shared story reading without adaptations, all participants demonstrated low levels of comprehension of the story and possessed limited ability to interact with the book. After UDL components were employed the participants began progressing at a more substantial rate.

The previously reported data demonstrated the efficacy of the intervention as seen by the increased number of independent correct responses from baseline to intervention. The data indicated that once the researcher implemented the intervention strategy all of the participants had increases in the number of independent correct responses, which is consistent with Browder, Mims, et al. (2008). The participants' progress trended upward during the intervention phase.

The data indicated that the participants became more proficient due to the implementation of the UDL strategies presented by the planning team. This is consistent with Vygotsky's (1978) contention that interaction between the individual with a disability and individuals within their environment provided the most promising potential for remediation.

When comparing the results of this study to those obtained in Browder, Mims, et al. (2008) the following similarities were noted: In Browder, Mims, et al. the increase in the number of independent correct responses from baseline to intervention for student 1 was 5.79; student 2 was 7.2 independent correct responses; and student 3 was 6.5 independent correct responses (see Table 7). In the current study for school number one participant 1 obtained an increase 9.7 independent correct responses, participant 2 obtained an increase of 9 independent correct responses, and participant 3 obtained an increase of 11.49 independent correct responses (see Table 7). The participants in school number two obtained the following results; Participant 4 obtained an increase of 10 independent correct responses, participated 5 obtained an increase of 5.99 independent correct responses, and participant 6 obtained an increase of 9.3 independent correct responses (see Table 7). It should be noted that the results from Browder, Mims, et al. were obtained during individual intervention sessions, whereas the results from this study were obtained within the context of small group instruction. The results are comparable to those of Browder, Mims, et al. in that increases in the number of independent correct were noted in both studies. However, the results from this study were more pronounced (i.e., participants demonstrated greater increases in the number of independent correct responses) than those found in Browder, Mims, et al. This could be due to the fact that participants in the current study had higher functioning age appropriate peers to model during small group instruction, which was not the case in Browder, Mims, et al.

The results of this study supported the efficacy of the intervention in augmenting the ability of the participants to produce independent correct responses while engaging in shared story reading within the context of a small group format. The data indicated that once the researcher applied UDL components to shared story reading in an effort to increase interaction and comprehension, the number of independent correct responses elicited by all six participants increased substantially. The results are consistent with previous research demonstrating the effectiveness of UDL components with shared story reading (Browder, Mims, et al., 2008).

Three potential factors were identified as possible explanations for the increased number of independent correct responses from participants on the task analysis. One factor for the increased rate of responses is that AAC techniques and/or devices are an avenue of expression, which encouraged learning with the Zone of Proximal Development, and a viable means to increase the ability for an individual to augment independent correct response (Bedrosian, 1999; Browder, Mims, et al., 2008; Light, 1997; Skotko, Koppenhaver, & Erickson, 2004; Vygotsky, 1993). Another possible factor is that this study employed objects related to the story (e.g., picture of a frog, cat, boy, etc.) to facilitate comprehension and the participant's ability to respond to probes. This is consistent with the Mims, Browder, Baker, Lee, and Spooner (2009) study in which the researcher employed concrete objects related to the book to increase participant interaction and comprehension (i.e., independent correct responses) of the participants. An additional factor that may be attributed to the increase in the number of independent correct responses is the fact that the researcher consistently maintained all 16 steps of the task analysis during each session. According to the Browder, Trela, and Jimenez (2007) study, maintaining all of the steps associated with a task analysis was a contributing factor to increasing the number of independent correct responses.

This study was consistent with Vygotsky's Learning Theory (1993), in that the participants had opportunities for learning that allow for active participation (Herb, 1997). According to Vygotsky's Learning Theory (1993), a skillful person in the participants' world is necessary to guide and pace the literacy instruction in order for the participant to have as many opportunities as possible to engage in literacy activities (Herb, 1997). Since the researcher has 25 years of experience teaching students with severe and multiple disabilities it would be rational to conclude that the researcher would meet this classification. However, it should not be construed that this degree of experience is a prerequisite to be considered skillful in this area. According to Herb, anyone with the capacity to challenge the student's abilities in a given area could be classified as skillful. The researcher became the cultural contact by engaging the participants in task related to reading that are within their learning curve but may require supports (e.g., Zone of Proximal Learning; Bronfenbrenner, 1995; Herb, 1997; Skinner, 1974; Vygotsky, 1993).

Other factors that are relative to the study are the UDL components (e.g., AAC techniques and devices) developed during team planning meetings that assisted the participants with engaging in the story as well as demonstrating comprehension, skill level, and interest in the task (CAST, 1998; Hunt, Soto, Maier, Liboiron, & Bae, 2004). The participants relied on AAC techniques and devices to become more active members of the class during literacy lessons and subsequently increased the number of independent correct responses on the task analysis (McGuire, Scott, & Shaw, 2006; Pisha,& Coyne, 2001; Spooner, Baker, Harris, Ahlgrim-Delzell, & Browder, 2007). Age appropriate peers participating in the small group instruction provided the potential for modeling of correct responses and interaction for the participants.

Table 7

Comparison of Studies

Browder, Mims, et al.	Baseline Average	Intervention Average	Difference
Student 1	7.3	13.9	+5.79
Student 2	3.0	10.2	+7.2
Student 3	2.0	8.5	+6.5
This Study	Baseline Average	Intervention Average	Difference
Participant 1	2.4	12.1	+9.7
Participant 2	.50	9.5	+9
Participant 3	.71	12.2	+11.49
Participant 4	1.8	11.8	+10
Participant 5	.31	10.2	+9.99
Participant 6	2.3	11.6	+9.3

Research Question 2

The second research question examined the effects of UDL components during shared story reading with a novel book. As in the previous question, the number of independent correct responses each participant demonstrated was measured on a task analysis. This phase of the study was referred to as generalization and consisted of the introduction of new materials (i.e., a new book, objects) into the framework of shared story reading. The generalization phase was introduced after the participants had completed the intervention phase in which three books were presented. The purpose of this phase was to determine whether learned skills or potential gains in the number of independent correct responses would be generalized to new material. During this phase of the study, all previously introduced intervention strategies were continued with a different book, which to this point, had not been part of the study. The introduction of new reading materials resulted in an initial decease in the number of independent correct responses, which were noted during visual inspection. However, the average scores for all participants

actually increased over intervention. All six participants demonstrated evidence of generalization of the intervention strategy to the shared story reading of a novel book.

The data demonstrated the efficacy of the intervention as seen by the increased number of independent correct responses from intervention to generalization. The data indicated that the participants were able to employ previously learned behaviors within the context of new materials in order to successfully respond to the researcher's probes. The participants were successful with novel materials secondary to continued access to the UDL strategies (e.g., AAC techniques and devices, scaffolding skills).

Vygotsky's (1978) Model of Learning addresses communication (e.g., responding to probes), interaction (e.g., participating in small group instruction), and engagement (e.g., using symbols, devices, words), which are all targeted in this study. According to Vygotsky (1978), individuals have the capacity to enhance learning through practice and modeling via social interaction (e.g., small group format). Both Skinner (1957) and Vygotsky (1978) indicated that literacy is a form of behavior (e.g., pointing or labeling), and is subsequently an important factor for social interaction. Therefore, a case could be made that teaching literacy skills is not only essential to education but also a critical element in the socialization process.

To date no peer reviewed empirical data could be located that examined generalization of independent correct responses to target literacy skills with students who have severe and multiple disabilities. This study is unique in regard to exploring the potential of generalization of skills for the target population. It is encouraging that the data from the generalization phase of this study indicated that the participants obtained abilities, which they were able to employ across materials. Browder, Mims, et al. (2008) study indicated that the implementation of a generalization phase would also serve to support their research.

The data indicated that UDL components not only generalized to another book but continued to facilitate increases in the number of independent correct responses for all participants. All six participants demonstrated increases in the number of independent correct responses during generalization. Two participants (i.e., 1 and 3) remained in the exceeded extended academic standards throughout the generalization phase. Three of the participants (i.e., 2, 4, and 5) were classified in the met extended academic standards prior to generalization and progressed into the exceeded extended academic standards upon completion of the generalization phase. One participant (i.e., 5) remained in the met extended academic standards during both the intervention and generalization phases of the study.

One explanation for the current finding was that participants were able to use previous learning, which was acquired during intervention, to interact and comprehend the new materials. These results were similar to other study results demonstrating the manner in which skills generalize to new material (Hanser & Erickson, 2007; Fallon Light, McNaughton, Drager, & Hammer, 2004; Jimenez, Browder, & Courtade, 2009; Millar, Light, & McNaughton, 2004). The ability for participants to generalize skills into novel materials has been attributed to confidence obtained during intervention and a means to facilitate interaction (e.g., AAC; Dyches, Davis, Lucido, & Young, 2002; Mechling, & Cronin, 2006). An additional factor that has been attributed to generalization, as well as the increase in the number of independent correct responses, was the fact that the researcher consistently maintained all 16 steps of the task analysis during each session. According to the Jimenez, Browder, and Courtade (2009) study, maintaining consistent steps in a task analysis allowed the students to anticipate the routine and follow through with correct responses in a novel setting after the introduction of new material. In

other words, the participants had become proficient with the concepts instead of just memorizing independent correct responses (Jimenez et al.).

Research Question 3

The third research question examined the effects of the components of UDL on participants' ability to maintain independent correct responses and progress through shared story reading within the framework of small group instruction as measured by the task analysis. This phase of the study was referred to as the maintenance phase and was introduced after the participants had a 2-week intermission from the original three books presented during intervention and a 1-week intermission from any presentation of the materials and intervention strategies. The purpose of this phase was to determine whether participants would be able to maintain independent correct responses after UDL components had been withdrawn for 1 week. After a visual inspection of the graph, it was apparent that when the participants engaged in shared story reading using the individualized strategies developed via UDL components during the intervention phase, all participants demonstrated increases in the average number of independent correct responses when compared to the intervention phase. Upon visual inspection of the graph, it became evident that when participants engaged in shared story reading during the maintenance phase, all participants demonstrated increases in the average number of independent correct responses when compared to generalization. The average scores during maintenance actually exceeded those for all other phases of the study across participants. As in the previous question, the increases each participant demonstrated to progress through shared story reading was measured on a task analysis.

The data demonstrated the efficacy of the intervention as seen by the increased number of independent correct responses from intervention to generalization through maintenance. The data indicated that the participants were able to employ previously learned behaviors over time in order to successfully respond to the researcher's probes. Having access to UDL strategies (e.g., AAC, scaffolding skills) provided the participants with the requisite confidence and skills to maintain intervention strategies over time. Vygotsky's (1993) Zone of Proximal Development related directly to the participants' progress with independent correct responses during shared story reading within the context of a small group format. Higher functioning nonparticipant members provided scaffolding skills through modeling responses and words of encouragement to the participants. The AAC techniques and devices allowed the participants a mode of communication to demonstrate comprehension.

The following increases among phases of the study were noted: Participant 1 had a 60.6% increase in the number of independent correct responses from baseline to intervention, a 5.7% increase from intervention to generalization, and a 14.3% increase from generalization to maintenance. Participant 2 had a 56.4% increase in the number of independent correct responses from baseline to intervention, a 23.7% increase from intervention to generalization, and a 10.7% increase from generalization to maintenance. Participant 3 had a 71.9% increase in the number of independent correct responses from baseline to intervention, a 6.8% increase from intervention to generalization, and a 13.8% increase from generalization to maintenance. Participant 4 had a 62.5% increase in the number of independent correct responses from baseline to intervention, a 7.5% increase from intervention to generalization, and a 12.5% increase from generalization to maintenance. Participant 5 had a 62.5% increase in the number of independent correct responses from baseline to intervention, a 9.7% increase from intervention to generalization, and a 13.2%

increase from generalization to maintenance. Participant 6 had a 58.1% increase in the number of independent correct responses from baseline to intervention, a 6.9% increase from intervention to generalization, and a 10.0% increase from generalization to maintenance (see Table 8).

Generally speaking, average scores on the task analysis increased during the maintenance phase as compared to the average scores obtained during the generalization phase. Actually, the average scores during the maintenance phase exceeded those of all other phases of the study for all participants. The data indicated that all participants not only maintained previously learned skills, but actually demonstrated increases in the average number of independent correct response with continued exposure to UDL strategies during shared story reading for the maintenance phase of the study. Despite the fact that scores for all participants increased during the maintenance phase, five participants (i.e., 1, 2, 3, 4, and 6) remained in the range of exceeded extended academic standards. One participant (i.e., 5) increased from met standards to exceeded extended academic standards, as defined by the ALSDE criteria (Morton, 2011).

One explanation that accounts for the ability of participants to maintain previously acquired materials was that they had actually learned a routine for interacting with books (Browder, Trela, & Jimenez, 2007; Mims, Browder, Baker, Lee, & Spooner, 2009). Research indicated that when participants were able to learn skills taught during intervention, they were able to maintain these skills after an intermission (Fallon, Light, McNaughton, Drager, & Hammer, 2004). The participants were successful due to the diminished fear of what is expected of them (Romski & Sevcik, 1997). Fidelity in maintaining the steps of the task analysis also has been attributed to maintenance. According to the Jimenez, Browder, and Courtade (2009) study, maintaining consistent steps in a task analysis allowed the participants to anticipate the routine, which augmented their ability to produce independent correct responses. In other words, the

participants had become proficient with the concepts associated with the task analysis instead of just memorizing independent correct responses (Jimenez et al.). Light (1997) indicated that continuous access to AAC has the capacity to increase the success rate for intervention strategies allowing participants to progress through their Zone of Proximal Development (Vygotsky, 1993).

The researcher was unable to locate any peer reviewed studies to date that examined maintenance of independent correct responses to target literacy skills with students who have severe and multiple disabilities. Browder, Mims, et al. (2008) listed this as a limitation and stated that maintenance measures would serve to expand the literature. The maintenance data reported in this study demonstrated positive results and continued learning. The positive results obtained in this study are especially meaningful, given the fact that it appears that this study represents the first documented attempt to utilize shared story reading within the context of a small group format employing multiple phases (i.e., baseline, intervention, generalization, and maintenance). Although similar interventions have been implemented with individuals and obtained positive outcomes (Browder, Mims, et al.; Koppenhaver, 2001, 2004), no research investigating the effects of shared story reading for students with severe and multiple disabilities participating in small group instruction could be located.

Table 8

Study Phases

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6
Intervention average	12.1	9.5	12.2	11.8	10.2	11.6
Increase over baseline	*60.6%*	*56.4%*	*71.9%*	*62.5%*	*62.5%*	*58.1%*
Generalization average	13	13.3	13.3	13	13.8	12.7
Increase over intervention	*5.7%*	*23.7%*	*6.8%*	*7.5%*	*9.7%*	*6.9%*
Maintenance average	15.3	15	15.5	15.	13.8	14.3
Increase over generalization	14.3%	10.7%	13.8%	12.5%	13.2%	10%

Limitations

The researcher noted the following limitations associated with the study. The participants selected for inclusion in this study were from two elementary schools within a single LEA located in one southeastern state within the United States. Therefore, the possibility existed that some extraneous variable may have been present that prevents the results obtained in this study from generalizing to this population as an aggregate. According to Browder, Mims, et al. (2008), future research should be conducted in the students' grade level with typical peers in order to assess the effectiveness of UDL components. However, since this study is an extension of the Browder, Mims, et al. (2008) study, it serves to minimize this concern. That is, other research on similar populations has produced comparable results.

Another limitation to this study was the sample size. Horner et al. (2005) and Kazdin (1982) indicated that a single subject design can include up to eight participants. Although six participants are considered to be an adequate sample for single subject research, it would require

replication with several studies with a sample equaling 30 participants to make a valid conclusion (Kazdin, 1982). This study was conducted on a sample of convenience. It employed a sample that was not randomly selected, but chosen on the basis of classroom assignment. This form of nonprobability sampling is considered acceptable practice and can provide useful information. However, the researcher should be aware of the fact that the results obtained when employing this design may not readily generalize (Ray, 1993).

The one limitation that directly affects the teacher was that a single individual cannot provide the literacy instruction and score the task analysis simultaneously. In addition, in its present form the task analysis cannot be scored for more than one student at a time. Therefore, these strategies require that multiple individuals are involved in the intervention process or that the process be recorded for later analysis. The task analysis could be amended and streamlined to enhance the ability of a single individual to complete the form while providing intervention strategies. Although the results achieved through the intervention were positive, the rubric was predicated upon the lowest complexity level for reading, and gives no credit for AAA (Morton, 2011). A ceiling effect was an artifact of the task analysis but the complexity level of the task analysis could be altered to allow for growth and the possibility of addressing more complex standards associated with the extended standards for reading, which will allow for potentially higher scores on the AAA.

Implications

Implications for Current Practice

The results from this study indicated that the intervention was successful in increasing the number of independent correct responses for participants with severe and multiple disabilities. The findings suggested that the task analysis for shared story reading can be used by teachers providing small group instruction as an assessment tool to measure the abilities in reading for student with severe and multiple disabilities and facilitate progress towards participating in shared stories. The task analysis can be used to mediate the educational needs for student achievement and guide the teacher in the area in which the student needs additional training. The task analysis can be used to provide future instruction appropriate for individual students. The complexity level used for the task analysis can be modified (i.e., redesigning a task analysis utilizing higher complexity level standards) to allow for growth and credit on the AAA.

The data indicated that all participants were able to interact appropriately during group settings. The participants were making progress toward the general education curriculum through extended standards, which are consistent with their IEP goals. Using scaffolding skills, AAC techniques, and devices, the participants were able to obtain skills that would allow them to progress to a higher level on the ALSDE extended standards for reading in all instances. This is consistent with Kazdin (1982) who indicated that the goal of the intervention would be to increase practical knowledge.

This study added to the literature, indicating that students with severe and multiple disabilities were able to progress and benefit from shared story reading when provided AAC techniques, devices, and scaffolding skills (e.g., modeling) through team planning with UDL components. Previous studies (Browder, Mims, et al., 2008; Skoto, Koppenhaver, & Erickson,

2004) emphasized the benefits students with severe and multiple disabilities obtained through exposure to literature with a meaningful method to communicate knowledge. Using UDL components (i.e., representation, expression, and engagement) in conjunction with shared story reading was an essential method to involve participants with severe and multiple disabilities in literacy training and can be used into adulthood (Browder, Mims, et al.). The task analysis developed by Browder, Trela, and Jimenez (2007), and amended for the Browder, Mims, et al. study, contained steps that targeted 23 of the steps of the extended standards for reading at the elementary level (see Appendix A). According to Browder, Mims, et al. (2008), all participants with severe and multiple disabilities deserve the necessary adaptations that would allow them a connection to literature (e.g., books on tape, read alouds).

The positive results of this study were significant in that they represent the first documented attempt to employ shared story reading within the context of small group instruction for students with severe and multiple disabilities. Although Browder, Trela, and Jimenez (2007) study published positive results for students with moderate disabilities in small group format, none have examined the effects of shared story reading targeting students with severe and multiple abilities. One finding in this study that was surprising was the inconsistency in which the participants responded to their name embedded within the story. Logic dictated that this would be one of the easiest steps in the task analysis yet it was the one that the participants frequently exhibited no reaction. This may be accounted for by the participants learning the routine of the stories and anticipating events (i.e., surprise elements, objects, and materials related to the stories). This also may be accounted for by the response being suppressed by the participants secondary to the familiarity of the stimuli.

Implications for Future Research

The participants demonstrated a slight decrease in performance during the maintenance phase of the study as compared to the end on intervention. However the data indicated that as long as the interventions (i.e., structures) were in place, the participants remained successful. One area in which future research should be conducted is whether participants can progress through shared story reading with interventions in a less restrictive environment (e.g., general education classroom, library, home). That is, generalize these skills to other environments, activities, and individuals.

Research has validated that single subject research is essential in identifying solutions for individuals with disabilities. Due to the limited research associated with this particular methodology (i.e., population and intervention strategy), single subject research requires more investigation into what specific techniques work for which subset of individuals, under what conditions, and associated with what tasks (Kazdin, 1982). The limited research in this area indicated that students with severe and multiple disabilities can learn literacy skills and comprehend concepts when presented with appropriate adaptations. This study is one of a few single subject studies that addressed this issue; additional studies would be required to replicate the study in order to ensure that shared story reading using UDL components promotes literacy skills for students with severe and multiple disabilities (Kazdin, 1982). In this study, the participants' scores on the task analysis indicated that the intervention strategies employed in relation to the UDL components had a positive effect on participants' interactions with the shared story reading during the literacy instruction. Although not relevant to this study, the task analysis also targeted 13 steps of the extended standards for reading at the secondary level. Therefore, this study could easily be adapted for implementation into a secondary setting.

The task analysis format could be redesigned to allow for data from more than one student to be collected on a single form. The grade level standards could be divided into separate task analysis for the students in certain grades, which will make it more convenient for the teacher to collect the body of evidence for the students' AAA. The task analysis could be redesigned into a format so that age appropriate peers (i.e., paraeducators, higher functioning students) could document the progress of other students while the classroom teacher guides the lesson. This would allow for the teacher to score the task analysis upon completion of instruction.

The scoring rubric used with the task analysis remains useful in conjunction with the AAA, but it will require some reconstruction in order to facilitate student progress to more complex standards. There are several areas that could be targeted with the reconstruction of the task analysis. One area is addressing higher level complexity goals to allow the students an opportunity to increase scores on the AAA, a second area is addressing different subjects, and a third area is addressing intraverbal training skills to include the comprehension skills associated with the Alabama Reading Extended Standards (or standards set forth by other states) within the new task analysis, lastly the specific AAC devices that are necessary to facilitate the participants' ability to meet the Alabama Reading Extended Standards should be incorporated within the task analysis This modifications would address the areas in which the participants are struggling.

Another single subject research design that could be beneficial in proving the effectiveness of shared story reading would be an ABAB design in which the participants return to baseline for various intervals. Once the implementation of the intervention phase has been established, students could be divided into several groups who return to baseline for varying intervals to determine how long the participants maintained the skills. This could serve at least

two functions: (1) to determine the duration of the treatment effect and (2) to determine the interval required for participants to regain any skills lost in the absence of intervention.

Very limited research was available that represents students with severe and multiple disabilities progressing in literacy lessons in the general education setting. The small group format would consist of students with severe and multiple disabilities and peers without disabilities. Therefore, conducting a study using UDL techniques and components in a general education setting to instruct shared story reading to the small group could produce interesting results. However, such a study would require a high degree of collaboration between the researcher, classroom, and/or special education teacher.

Skinner's (1957) research applies to the current research study in that the task analysis consists of five steps that relate to intraverbals, so, in effect, the researcher was training the participants with severe and multiple disabilities to interact appropriately with their environment or others by allowing them to practice using or responding to intraverbals. There are 15 of the 16 steps in the task analysis that corresponded to the Alabama Reading Extended Standards for the elementary level (Morton, 2006) to allow for progress towards the general education curriculum. The task analysis has at least 6 steps that related directly to comprehension that demonstrates understanding of text. Augmentative and alternative techniques and devices were utilized for at least 8 steps in the task analysis. The researcher and other professionals provided feedback to the participants' correct interactions or responses with educational or social reinforcers and the devices (i.e., Big Mac, CommuniBuilder, SuperTalker, Tech-Talk Communication Builder) can provide feedback when activated with the appropriate response (Frost & Bondy, 2006; Skinner, 1957). Therefore, two areas that can be examined in future research are training participants

more intensely with intraverbal skills and the utilization of AAC in developing more advanced comprehension skills in the area of reading.

Summary

The NCLB (2001) and IDEA (2004) mandated that all students receive evidence-based practices that have been proven effective on the target population. Both IDEA and NCLB directed that students with significant cognitive disabilities receive a quality education in the general education curriculum. Therefore, educators have the responsibility to plan for and implement strategies that have been proven effective. Because the implementation of UDL components with shared story reading has been indicated effective by research, this methodology should be investigated as a viable intervention to fill this void for individuals with severe and multiple disabilities. This study was an extension of Browder, Mims, et al. (2008) and adds to the literature by promoting learning through shared story reading within the context of a small group format, continued learning of targeted skills to a new book as indicated by the collected data for generalization, and maintaining learned skills over time during the maintenance phases.

This study indicated the effectiveness of UDL components with shared story reading in facilitating the number of independent correct responses across participants and conditions. During this study, the participants presented with noticeable increases in interaction and participation in the literacy instruction. The participants' scores on the task analysis indicated that the intervention strategies employed in relation to the UDL components had a positive effect on the participants' ability to interact, comprehend, and engage in shared story reading during the literacy instruction. Without the intervention, the participants likely would not have obtained increased scores on the task analysis. As indicated by the data, all of the participants made

significant progress in the number of independent correct responses as measured by the task analysis. All of the participants were described as having various abilities and disabilities; but, all six of the participants demonstrated increased engagement with the shared stories. The two participants (i.e., 1 and 5) who were considered to have the most significant involvement made increases in independent correct responses comparable to or exceeding the other four participants. This indicated that the UDL components were equally as effective on participants with the most severe disabilities.

The team planning meetings were an essential part of the intervention process. When using UDL components, it is imperative to reach an accurate consensus on the AAC devices and techniques to implement, which will yield positive results for a particular participant. In the event the devices and/or techniques that were initially implemented did not facilitate engagement or allow participants to demonstrate knowledge, then another team planning meeting must be conducted to discuss other avenues. The participants can only perform to the best of their ability when the team or teacher has provided the devices and or techniques to allow the participant an avenue to interact and demonstrate comprehension of the materials. A goal of the literacy lesson is that the participants must be able to learn, communicate, and express knowledge in a manner that the majority of the population can understand (Bedrosian, 1999).

The results of the study indicated that all participants exhibited an increase in independent correct responses during all three phases of the study. Some regression was noted when a new phase of the study was introduced, but, overall, the entire population selected for inclusion into this study exhibited an increase in the number of independent correct responses throughout the study. This indicated that the UDL components continued to allow the

participants to progress throughout the study. This study adds to the small, but growing evidence-based practices for students with severe and multiple disabilities.

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APPENDIX A

TASK ANALYSIS FOR SHARED STORIES

Task Analysis for Shared Stories

Steps of task analysis	**Alabama Reading Extended Standards Elementary**	**Examples of Independent Correct Responses**
Choose book to read (Step 1)		Touches one book, touches one book cover presented on white board, holds eye gaze on one book, reaches for one book, verbalizes, activate voice output device
Attend to chosen book while title and author are read (Step 2)	Grade 1, Standard 4, Complexity 1 Grade 4 Standard 1 & 5, Complexity 1	Holds eye gaze on chosen book cover for at least two seconds
Attend to materials used to introduce theme of story (Step 3)	Grade 4, Standard 4, Complexity 1	Holds eye gaze toward material
Makes a prediction when asked, "What do you think the story is about?" Shown 2 objects (Step 4)	Grade 1, Standard 4, Complexity 1	Touches one object, holds eye gaze on one object, reaches toward one object, verbalizes, activate voice output device
Reacts to name embedded within the story (Steps 5,8,11)	Grade K, Standard 1, Complexity 1 Grade 2, Standard 4, Complexity 1 Grade 4, Standard 1, Complexity 1 Grade 4, Standard 2, Complexity 1	Laughs, smiles, turns head toward reader, opens eyes, lifts head, vocalizes, verbalizes
Focuses on objects when named in story and displayed to student (steps 6,9, 12)	Grade K, Standard 2, Complexity 1 Grade 1, Standard 5, Complexity 1 Grade 4, Standard 1, Complexity 1	Touches one object, holds eye gaze on one object, reaches toward one object, verbalizes

Steps of task analysis	Alabama Reading Extended Standards Elementary	Examples of Independent Correct Responses
Participate in reading by completing repeated storylines (Step 7, 10, 13)	Grade 3, Standard 3, Complexity 1 Grade 4, Standard 2, Complexity 1	Activates voice output device within five seconds of reading first half of line (wait longer if student is moving toward device until response is completed), reads picture symbol sentence strip, verbalize
React to surprise element within the story (Step 14)	Grade K, Standard 1, Complexity 1 Grade K, Standard 3, Complexity 1 Grade 2, Standard 4, Complexity 1 Grade 3, Standard 5, Complexity 1	Laughs, smiles, turns head toward reader, opens eyes, lifts head, vocalizes, verbalizes
When presented with objects used for prediction. Answers question, "What was the story about?" (Chooses correct object) (Step 15)	Grade K, Standard 2, Complexity 1	Touches one object, holds eye gaze on one object, reaches toward one object, verbalizes, activate voice output device
When asked "Do you want to read the story again?" Indicate/Answer Yes/No (Step 16)	Grade K, Standard 5, Complexity 1, 2, 3 Grade 2, Standard 3, Complexity 1	Touches one symbol, holds eye gaze on one symbol, reaches toward one symbol, verbalizes, activate voice output device

(Browder, Mims, Spooner, Ahlgrim-Delzell, & Lee, 2007; Morton, 2006)

APPENDIX B

UDL COMPONENT QUESTIONS WITH TASK ANALYSIS

Task Analysis Steps	**Representation** Is there a better way to present this step?	**Expression** Is there an alternative way the student could more easily make the response?	**Engagement** How can the response be prompted so the student learns the desired response? How can prompt be faded?
1 Choose a book			
2 Attend to book			
3 Attend to material			
4 Prediction w/ 2 object			
5, 8, 11 React to name			

6, 9, 12 Focus on Object			
7, 10, 13 Completes storyline			
14 React to surprise			
15 Comprehension w/ 2 objects			
16 Read again?			

(Browder, Mims, Spooner, Ahlgrim-Delzell, & Lee, 2007)

Participant 1
Members present: researcher, teacher, AIDB, input from speech teacher and PT
2/8/2012

Task Analysis Steps	**Representation** Is there a better way to present this step?	**Expression** Is there an alternative way the student could more easily make the response?	**Engagement** How can the response be prompted so the student learns the desired response? How can prompt be faded?
1 Choose a book	Color blind so present book covers enlarged in black and white also outline main picture with black marker, dim lights when using white board Name the books AIDB says participant is auditory learning more than likely	Participant attempts to vocalize (give the word guy for boy because participant cannot say boy) Touch book cover hard copy or on white board	Encourage participant to look at the covers or board
2 Attend to book	Present in front of study group then share with classmates	Cocks head, widens eyes, makes sounds, laughs	
3 Attend to material	Name objects that are being presented	Let participant handle or touch objects	Adult comments about objects as participant touches them
4 Prediction w/ 2 object	Researcher names objects presented and ask the question close to the participant	Touches, vocalizes, attempts to name object that relates	

5, 8, 11 React to name	Researcher will read this page close to the named participant	Laughs, smiles, vocalizes	
6, 9, 12 Focus on Object	Name object prior to bringing it close, participant appears scared of some objects	Touches, attempts to name	Adults tells participant that object is in front of him or on his tray
7, 10, 13 Completes storyline	Researcher says first part of the storyline while in front of study group	Activates SuperTalker after researcher says first part of storyline Attempts to verbalize	Adult assist participant in finding the voice output device and lets participant practice pushing prior to the time to respond to storyline
14 React to surprise	Present surprise element near study group first	Laughs, smiles, squeals,	
15 Comprehension w/ 2 objects	Researcher names objects presented and ask the question close to the participant	Touches, vocalizes, attempts to name object that relates	
16 Read again?	Ask question in front of participant and give choices verbally and with symbols	Touch symbols or verbalize	Notes from PT for all steps… Have all straps connected on wheelchair, lap tray, position participant close to objects, books, board

Participant 2
Members present: researcher, teacher input provided by speech teacher
2/8/2012

Task Analysis Steps	**Representation** Is there a better way to present this step?	**Expression** Is there an alternative way the student could more easily make the response?	**Engagement** How can the response be prompted so the student learns the desired response? How can prompt be faded?
1 Choose a book	Hold books back –out of arms reach when asking the question then bring closer	Touches (slaps), grabs	Adult will remind participant to be easy and use one hand
2 Attend to book	Researcher will be positioned in front of study group	Points, rocks toward book, widens eyes	
3 Attend to material	Hold objects back –out of arms reach when naming objects then bring closer	Touches, grabs	Adult will remind participant to be easy and use one hand
4 Prediction w/ 2 object	Hold objects back –out of arms reach when naming objects then bring closer when asking the question	Touches, grabs, names	

7, 10, 13 Completes storyline	Researcher will stand in front of study group when reading these pages	Activates a CommuniBuilder with recorded message of second part of storyline that is positioned on a box in front of participant	Adult reminds participant to use one hand and to be easy
14 React to surprise	Researcher will be positioned in front of study group	Laughs, smiles, covers face, jumps up	
15 Comprehension w/ 2 objects	Hold objects back –out of arms reach when naming objects then bring closer after question is asked	Touches, grabs, names	
16 Read again?	Researcher will stand in front of participant and ask the question	Use large communication board with yes/no symbols outlined with puffy paint	Adult will remind participant to use one hand and to be easy

Notes: prior to reading –teacher or paraeducator will provide participant 2 with vestibular exercise—deep pressure

Participant 3
Members present: researcher, teacher, paraeducator, input from speech teacher
2/8/2012

Task Analysis Steps	**Representation** Is there a better way to present this step?	**Expression** Is there an alternative way the student could more easily make the response?	**Engagement** How can the response be prompted so the student learns the desired response? How can prompt be faded?
1 Choose a book	Ask the question one time	repeats a word in the title, touches	
2 Attend to book	Researcher will stand in front of the study group when presenting this part	Repeats words that researcher said, raises eyebrows	
3 Attend to material	Researcher will present objects without the feet showing	name the objects	
4 Prediction w/ 2 object	Name the objects then ask the question	Touches, names	Adult reminds participant to choose one of the presented objects to answer the question
5, 8, 11 React to name	Researcher will read the pages in front of the participant	Smiles, raises eyebrows, looks around	Adult uses participant's name with the action or page read
6, 9, 12 Focus on Object	Researcher will present objects	Touches, names objects, handles objects	

7, 10, 13 Completes storyline	Researcher stands in front of the study group and says the first part of the storyline	Activates the Tech/Talker Communication Builder	
14 React to surprise	Researcher stands in front of the study group	Smiles, startles, raises hands/arms	
15 Comprehension w/ 2 objects	Name the objects then ask the question while showing book and objects	Touches, names	Adult reminds participant to choose one of the presented objects to answer the question
16 Read again?	Researcher will stand in front of participant and ask the question Give choices yes/no and say tell me	Use communication board with picture symbols Use both sides of board to switch the symbols order	Adult will remind participant to make a choice

Participant 4
Members present: researcher, teacher, speech teacher
2/8/2012

Task Analysis Steps	**Representation** Is there a better way to present this step?	**Expression** Is there an alternative way the student could more easily make the response?	**Engagement** How can the response be prompted so the student learns the desired response? How can prompt be faded?
1 Choose a book	Move the books slightly Wait longer	Touching or holding is acceptable	repeat question but not too many times
2 Attend to book	Be positioned near the three participants, then show to the rest of the classmates	Watch the eyes	
3 Attend to material	Name the individual objects	Allow time	Make the request to look at objects.
4 Prediction w/ 2 object	Keep the same spacing between the objects and the participant Show book again	Allow participant to hold the correct object	
5, 8, 11 React to name	Say name louder or more excitedly	Attends to eyes and posture	Read in front of participant

6, 9, 12 Focus on Object	Be mindful that participant scares easily Keep the same spacing between the objects and the participant	Attends to eyes and posture	
7, 10, 13 Completes storyline	Comment the other classmates who are responding appropriately	Voice output device with picture symbols and recorded message…CommuniBuilder	Adult models using voice output device by activating it for the first part of the storyline
14 React to surprise	Don't present too close, participant scares easily	Jumping out of seat is acceptable	
15 Comprehension w/ 2 objects	Make the request to look at objects. Keep the same spacing between the objects and the participant		Name the individual objects
16 Read again?	Just ask the question without offering choices	Use separate symbols	Show book again

Participant 5
Members present: Research, teacher, speech teacher, paraeducator, physical therapist, input from AIDE
2/8/2012

Task Analysis Steps	**Representation** Is there a better way to present this step?	**Expression** Is there an alternative way the student could more easily make the response?	**Engagement** How can the response be prompted so the student learns the desired response? How can prompt be faded?
1 Choose a book	Use auditory scanning, wait for 2 seconds when presenting book titles, say the titles multiples times	BigMac recorded message is "that's it"	Prop elbow on towel or pillow Hand over hand if no response Use his name & encourage when no response is given
2 Attend to book	Each book has a main color put that color on black background AIDB suggested textures Speech suggested glue	Attend to eyes and mouth	Hold at eye level
3 Attend to material	Name objects and let him feel the objects	Attend to eyes and mouth	
4 Prediction w/ 2 object	Name objects	Use auditory scanning, wait for 2 seconds when presenting objects, name the object multiples times	Prop elbow on towel or pillow Make sure hand is on the right side of the BigMac and that BigMac is midway down on tray
5, 8, 11 React to name	Present close to participant	Smiles or holds head up	Adult says did you hear that you did …

6, 9, 12 Focus on Object	Use textures or smells	Attend s with eyes, posture, and mouth	
7, 10, 13 Completes storyline	Have teacher and paraeducator say beginning of storyline after researcher	BigMac recorded message is the second half of storyline	
14 React to surprise	Loud noises, funny sounds	Laughs, smiles, moves head, startles	
15 Comprehension w/ 2 objects	Name the presented objects when asking the question	Use auditory scanning, wait for 2 seconds when presenting objects, name the object multiples times	
16 Read again?	Ask the question close to participant (in his ear)	Use auditory scanning, wait for 2 seconds when presenting the choices yes and no multiples times	

Participant 6
Members present: researcher, teacher, paraeducator, speech teacher
2/8/2012

Task Analysis Steps	**Representation** Is there a better way to present this step?	**Expression** Is there an alternative way the student could more easily make the response?	**Engagement** How can the response be prompted so the student learns the desired response? How can prompt be faded?
1 Choose a book	Hold books close to face Repeat request often	Say use one hand to show me	One hand may need to be held
2 Attend to book	Hold book close to face	Posture is the participant shows attending Touches book (slaps)	With book close to participant maybe some of the posturing will limited and touch will be softer
3 Attend to material	Hold close within her vision	Touches or grabs objects	Remind participant to look at objects and be easy
4 Prediction w/ 2 object	Remind participant to look at objects while researcher names objects then ask the question- multiple times may be needed	Touches or grabs objects	Remind participant to look at objects and be easy
5, 8, 11 React to name	Read in front of participant when using their name	Laughs, smiles, looks closely at page, touches book, pats self	Adult will pat participant, repeat action or line in the story with participant's name if no response

6, 9, 12 Focus on object	Researcher will name object while presenting it close to the participant		
7, 10, 13 Completes storyline	Say the first part of the storyline close the to the study group Comment as classmates say storyline	Use SuperTalker with pre recorded message of the last part of the storyline	Adult says beginning of storyline multiple times
14 React to surprise	Present surprise close to the study group	Laughs, squeals, jumps up, Claps hands	
15 Comprehension w/ 2 objects	Remind participant to look at objects while researcher names objects then ask the question- multiple times may be needed	Touches or grabs objects	
16 Read again?	Stand in front of participant to ask and say yes while touching symbol and say no while touching symbol	Touch symbol	

Participant 1
Members present: researcher, teacher, paraeducator, and OT
2/29/2012

Task Analysis Steps	**Representation** Is there a better way to present this step?	**Expression** Is there an alternative way the student could more easily make the response?	**Engagement** How can the response be prompted so the student learns the desired response? How can prompt be faded?
1 Choose a book	Dim lights for white board presentation of book covers. Reminder: put hands on tray while looking	Use hands instead of pen to choose book.	Reminder: Look then choose
2 Attend to book	Present in front of study group then share with classmates	Cocks head, widens eyes, makes sounds, laughs, vocalizes	Researcher points to author and title
3 Attend to material	Name objects that are being presented Change wheelchair tray for more stable tray.	Let participant handle or touch objects	Adult comments about objects as participant touches them
4 Prediction w/ 2 object	Researcher names objects presented and ask the question close to the participant	Touches, vocalizes, attempts to name object that relates	
5, 8, 11 React to name	Researcher will read this page close to the named participant-emphasize name	Laughs, smiles, vocalizes, cocks head, leans forward	Adult comments about the statement made with the participant's name

6, 9, 12 Focus on object	Use objects that create a noise or noisy when touched.	Touches, attempts to name squeals, laughs	
7, 10, 13 Completes storyline	Researcher says first part of the storyline while in front of study group	Activates SuperTalker after researcher says first part of storyline Attempts to verbalize	Adult assist participant in finding the voice output device and lets participant practice pushing prior to the time to respond to storyline. The talker is turned vertically.
14 React to surprise	Present surprise element near study group first	Laughs, smiles, squeals,	
15 Comprehension w/ 2 objects	Researcher names objects presented while telling the participant to look or touch. Ask the question close to the participant.	Touches, vocalizes, attempts to name object that relates	Adult tells participant to get ready to answer the question, his turn is coming up next.
16 Read again?	Ask question in front of participant and give choices verbally and with symbols	Touch symbols or verbalize	Notes from PT for all steps… Have all straps connected on wheelchair, lap tray, position participant close to objects, books, board

Participant 5
Members present: researcher, teacher, speech teacher, paraeducator,
2/29/2012

Task Analysis Steps	**Representation** Is there a better way to present this step?	**Expression** Is there an alternative way the student could more easily make the response?	**Engagement** How can the response be prompted so the student learns the desired response? How can prompt be faded?
1 Choose a book	Use auditory scanning, wait for 2 seconds when presenting book titles, say the titles multiples times-TALK slow	BigMac recorded message is "that's it" with teacher's voice. Have students join in.	Prop elbow on towel or pillow Hand over hand if no response Use his name & encourage when no response is given
2 Attend to book	Each book has a main color put that color on black background AIDB suggested textures	Attend to eyes, mouth, and head-movement may be slight	Hold at eye level
3 Attend to material	Name objects and let him feel or hear the objects	Attend to eyes, mouth, and head-movement may be slight	
4 Prediction w/ 2 object	Name objects Use tone to encourage	Use auditory scanning, wait for 2 seconds when presenting objects, name the object multiples times Have students join in.	Prop elbow on towel or pillow Make sure hand is on the right side of the BigMac and that BigMac is midway down on tray

5, 8, 11 React to name	Present close to participant Use a funny tone of voice	Smiles or holds head up	Adult says did you hear that you did … Nudge participant and comment
6, 9, 12 Focus on object	Use textures, smells, or noise. TALK SLOW	Attend s with eyes, posture, and mouth	Adult comments on object as it relates to story
7, 10, 13 Completes storyline	Have teacher and paraeducator say beginning of storyline after researcher. Let the other students join in. Make it funny, entertaining.	BigMac recorded message is the second half of storyline with teacher voice or student voice	
14 React to surprise	Loud noises, funny sounds	Laughs, smiles, moves head, startles	

15 Comprehension w/ 2 objects	Name the presented objects when asking the question	Use auditory scanning, wait for 2 seconds when presenting objects, name the object multiples times. Have students join in.	
16 Read again?	Ask the question in front of participant	Use auditory scanning, wait for 2 seconds when presenting the choices yes and no multiples times Have students join in.	

APPENDIX C

INSTITUTIONAL REVIEW BOARD REQUEST FOR APPROVAL

Office for Research

Institutional Review Board for the
Protection of Human Subjects

THE UNIVERSITY OF
ALABAMA
RESEARCH

January 4, 2012

Cynthia D. Lee, Ed.S.
SPEMA
College of Education
4926 Emerald Bay Drive
Northport, AL 35473

Re: IRB Protocol # 11-017: "Teaching Students with Severe and Multiple Disabilities: The Implementation of Shared Stories"

Dear Mrs. Lee,

The University of Alabama Non-Medical Institutional Review Board has received the revisions requested by the full board on 12/21/2011. The Board has reviewed the revisions and your protocol is now approved for a one-year period.

Please be advised that your protocol will expire one year from the date of approval, 12/16/2011. If your research will continue beyond this date, please complete the IRB Renewal Application. If you need to modify the study, please submit the Modification of an Approved Protocol form. Changes in this study cannot be initiated without IRB approval, except when necessary to eliminate apparent immediate hazards to participants. When the study closes, please complete the Request for Study Closure (Investigator) form.

Should you need to submit any further correspondence regarding this application, please include the above protocol number.

Good luck with your research.

Sincerely,

[redacted]

Stuart Usdan, Ph.D.
Chair, Non-Medical Institutional Review Board
The University of Alabama

358 Rose Administration Building
Box 870127
Tuscaloosa, Alabama 35487-0127
(205) 348-8461
FAX (205) 348-7189
TOLL FREE (877) 820-3066

IRB Project #: 11-017

SEP 29 2011 PM04:39

UNIVERSITY OF ALABAMA
INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN SUBJECTS
REQUEST FOR APPROVAL OF RESEARCH INVOLVING HUMAN SUBJECTS

I. **Identifying information**

	Principal Investigator	Second Investigator	Third Investigator
Names:	Cynthia D. Lee Ed.S. (Student)	Mary Beirne-Smith Ed.D.	
Department:	Special Ed. and Muitiple Abilities	Special Ed. and Multiple Abilities	
College:	Education	Education	
University:	The University of Alabama	The University of Alabala	
Address:	4926 Emerald Bay Drive Northport Al. 35473	Box 870232	
Telephone:	(205) 333-0186	(205) 348-6093	
FAX:		(205) 348-9863	
E-mail:	lee071@crimson.ua.edu	mbeirne@bamaed.ua.edu	

Title of Research Project: Teaching Students with Severe and Multiple Disabilities: The Implementation of Shared Stories.

Date Submitted: 9/29/2011
Funding Source: N/A

Type of Proposal ☒ New | ☐ Revision | ☐ Renewal Please attach a renewal application | ☐ Completed | ☐ Exempt

Please attach a continuing review of studies form

Please enter the original IRB # at the top of the page

UA faculty or staff member signature: [redacted]

II. NOTIFICATION OF IRB ACTION (to be completed by IRB):
Type of Review: ✓ Full board ___ Expedited

IRB Action:
___ Rejected Date: _____
___ Tabled Pending Revisions Date: _____
___ Approved Pending Revisions Date: _____
✓ Approved-this proposal complies with University and federal regulations for the protection of human subjects.
Approval is effective until the following date: 12/20/2012
Items approved: ✓ Research protocol (dated_____)
✓ Informed consent/assent (dated_____)
✓ Recruitment materials (dated_____)
___ Other (dated_____)

Approval signature [redacted] Date 1/4/2012

AAHRPP DOCUMENT #192

UNIVERSITY OF ALABAMA
HUMAN RESEARCH PROTECTION PROGRAM

Informed Consent for a Non-Medical Study

Study title: Teaching students with severe and multiple disabilities: The implementation of shared stories.
Cynthia D. Lee, Primary Investigator, Doctoral Student
Your child is being asked to take part in a study. The study is being done by Cynthia D Lee, who is a doctoral student in special education at The University of Alabama. Mrs. Lee is a retired special education teacher with over 25 years experience. Mrs. Lee is being supervised by Dr. Mary Beirne-Smith who is a professor of special education at The University of Alabama.

What is this study about? What is the investigator trying to learn?
This study is being done to find out if planning for all students in the classroom before the lesson increases students' correct responses during shared story reading.

Why is this study important or useful?
This information is important because special educators need to learn and use more interventions that are good and helpful in order to improve instruction in the general education curriculum. The results will help special educators understand better ways to help students with severe and multiple disabilities participate in reading instruction.

Why has my child been asked to be in this study?
Your child has been asked to be in this study because of attendance in a special education classroom at your child's school. Your child is considered nonverbal (less than 100 word vocabulary).

How many people will be in this study?
The literature lesson will be presented to all students in the classrooms who have returned signed consent forms. The small group will consist of no more than 30 students.

What will my child be asked to do in this study?
Your child will participate in the class' regularly scheduled reading lessons with the researcher presenting the lesson three days a week for up to 40 minutes. Your child will be provided with toys and pictures, which will increase independent responses to the reading lessons. I would like to videotape in order to record and score your child's responses to questions about books read during the lessons.

UNIVERSITY OF ALABAMA IRB
CONSENT FORM APPROVED: 1/4/2012
EXPIRATION DATE: 12/20/2012

How much time will my child spend being in this study?
Every student in the class will participate in regularly scheduled reading lessons, which may last up to 40 minutes. This is part of your child's Individualized Education Plan. Students who have permission to participate will spend an additional 10 minutes answering questions about the reading lessons. The lessons will be taught 3 days per week over a period of 12 weeks.

Will being in this study cost me anything?
There will be no cost to you for your child to participate in this study.

Will I be compensated for being in this study?
You or your child will not be paid for being in this study.

What are the risks (dangers or harms) to my child if my child is in this study?
The risks of the proposed study are no greater than those encountered in everyday school life. The study involves educational interventions similar to those presented in the classroom's regularly scheduled reading lessons.

What are the benefits (good things) that may happen if my child is in this study?
There are no direct benefits to your child. However, your child's ability to participate in reading instruction in the classroom might be improved by having toys and pictures available that relate to the stories.

What are the benefits to science or society?
This study will help special educators to be more helpful to students with severe and multiple disabilities in participating in the general education curriculum (e.g., reading instruction).

How will my child's privacy be protected?
The videotaped lessons will be kept by the Primary Investigator and shown to the classroom teacher to record and score the participants' responses to the task analysis. All reasonable efforts will be made to videotape only study participants; however, no guarantees can be made that a non-study participant will not be accidently videotaped. In the event a non-study participant is accidently recorded no data will be used for the study. All videotaped lessons will be reviewed in the special education classroom or other private and secure room. The videotapes will be destroyed within one year of the completion of the study.

How will my child's confidentiality be protected?
The videotapes and data from task analysis will be kept in a locked filing cabinet at the Primary Investigator's home office and will not be shared with those not directly involved in implementing the study. Any articles or data written about the study will refer to your child with a code (e.g., participant 1, student 1). You child's name will not be reported in the study's reports. The videotaped lessons will be retained by the Primary Investigator and shown to the team planning members to record and score the participants' responses to the task analysis. The videotaped lessons will be reviewed in the special education classroom or other private and secure room. The videotapes will be destroyed within one year of the completion of the study.

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CONSENT FORM APPROVED: 1/4/2012
EXPIRATION DATE: 12/20/2012

What are the alternatives to being in this study? Do I have other choices?
The alternative or other choice to being in this study is not to participate. There will be no effect on your relations with your child's school.

What are my rights as a participant in this study?
Taking part in this study is voluntary. It is your free choice. You can refuse to be in it at all. If your child starts the study and decides not to continue he/she can stop at any time.

The University of Alabama Institutional Review Board ("the IRB") is the committee that protects the rights of people in research studies. The IRB may review study records from time to time to be sure that people in research studies are being treated fairly and that the study is being carried out as planned.

Who do I call if I have questions or problems?
If you have questions, concerns, or complaints about the study later on, please call Cynthia Lee at (205) 333-0186.
If you have questions about your rights as a person in a research study, call Ms. Tanta Myles, the Research Compliance Officer of the University, at 205-348-8461 or toll-free at 1-877-820-3066.

You may also ask questions, make suggestions, or file complaints and concerns through the IRB Outreach website at http://osp.ua.edu/site/PRCO_Welcome.html or email us at participantoutreach@bama.ua.edu.

After you participate, you are encouraged to complete the survey for research participants that is online at the outreach website or you may ask the investigator for a copy of it and mail it to the University Office for Research Compliance, Box 870127, 358 Rose Administration Building, Tuscaloosa, AL 35487-0127.

UNIVERSITY OF ALABAMA IRB
CONSENT FORM APPROVED: 1/4/2012
EXPIRATION DATE: 12/20/2012

I have read this consent form. I have had a chance to ask questions. I agree to take part in it. I will receive a copy of this consent form to keep.

_____My Child HAS permission to participate in this research study, which will include videotaping my child during the lessons.

_____ My Child DOES NOT have permission to participate in this research study

_____

Signature of Research Participant's Parent/Legal Guardian Date

_____

Signature of Investigator Date

UNIVERSITY OF ALABAMA IRB
CONSENT FORM APPROVED: 1/4/2012
EXPIRATION DATE: 12/20/2012

STUDY PARTICIPANT'S ASSENT

Hi (student's name). My name is Mrs. Cynthia Lee. I go to school at The University of Alabama. I am doing a study to help students read books. You are in Mrs. (teacher's name) class so I asking if you would like to be in my study.

Here is what will happen. I will read a story to your class. You will answer questions about the story using toys and pictures. It will take about 30 minutes. Most kids think that reading like this is fun.

Your parents know that I am asking you to do this and it is okay with them.

I will video tape the reading and only your teacher and myself will watch it.

If something makes you feel bad while reading please tell me. If you decide you do not like our reading you can stop at anytime.

Do you have any questions about this? You can ask me right now.

Do you think you would like to read with me and your class?

YES NO

Signature of Person Obtaining Assent

Date

UA IRB Approved Document
Approval date: 1/4/2012
Expiration date: 12/20/2012

Dear (Parent or Legal Guardian of Non-Study Participant),

I am a doctoral student in the Department of Special Education at The University of Alabama. I am teaching special reading lessons using toys and pictures to help students answer questions as part of a research project. This lesson will be taught in your child's classroom and will not add any time to your child's school day. The lessons will be taught during normal reading time 3 days a week for up to 12 weeks. My research study is approved by your child's principal, as well as The University of Alabama Institutional Review Board.

This type of reading lesson has been proven to help children with reading skills and give them a way to answer questions correctly. The reading lessons will be videotaped so that I can review the tapes with your child's teacher. Your child will not be videotaped on purpose but may accidentally get into the picture. Nobody but myself and the classroom teacher will be able to watch the tapes and they will be destroyed after the study is complete.

If you have questions about your rights as a person taking part in a research study, make suggestions or file complaints and concerns, you may call Ms. Tanta Myles, the Research Compliance Officer of the University of Alabama at (205) 348-8461 or toll-free at 1-877-820-3066. You may also ask questions, make suggestions, or file complaint and concerns through the IRB Outreach Website at http://osp.ua.edu/site/PRCO_Welcome.html. You may email us at participantsoutreach@bama.ua.edu.

If you have any questions about this study, or would like additional information feel free to contact me, Cindy Lee, at (205) 333-0186. Enclose is a consent form. Please read it carefully, sign and return it in the enclosed envelope. Allowing your child to participate in these lessons is completely voluntary. Thanks for your help.

Sincerely,

Cynthia D. Lee, EdS, N.B.C.
Special Education and Multiple Abilities Program, College of Education
The University of Alabama

I have read this consent form. I have had a chance to ask questions. I agree to take part in it. I will receive a copy of this consent form to keep.

_____**My Child HAS permission to participate in this reading lesson research study, which could include videotaping my child during the lessons.**

_____ **My Child DOES NOT have permission to participate in this reading lesson research study**

_____

Signature of Non-study Participant's Parent/Legal Guardian Date

_____

Signature of Investigator Date

UA IRB Approved Document
Approval date: 1/4/2012
Expiration date: 12/20/2012

APPENDIX D

LETTER TO SYSTEM-LEVEL ADMINISTRATORS

[redacted]

January 24, 2012

Cynthia D. Lee, Ed.S, N.B.C.
Special Education and Multiple Abilities Program
College of Education
The University of Alabama
c/o 4926 Emerald Bay Drive
Northport, AL 35473

RE: IRB # *(11-017) "Teaching Students with Severe and Multiple Disabilities: The Implementation of Shared Stories"*

Dear Ms. Lee:

Your request to conduct a study with the Tuscaloosa City Schools is granted. Your proposal is clearly written and you have complied with the requirements of our system.

You may contact the building principals to make them aware of your needs and requests. Since there are many researchers requesting studies at any given time, we leave the final decision to participate to the building principal.

I wish you continued success with your project.

Sincerely,

[redacted]

Elisabeth Davis, Ed.D.
Assistant Superintendent for Curriculum & Instruction

cc: Principals

[redacted]

Tuscaloosa City Board of Education

1210 21st Ave
Tuscaloosa, AL 35401

October 12, 2011

Dear Dr. Paul McKendrick,

I am a doctoral student in the Department of Special Education and Multiple Abilities Program at The University of Alabama conducting research under the supervision of Dr. Mary Beirne-Smith. The purpose of my research is to explore the results of employing a task analysis during literacy instruction in an effort to identify successful strategies for students with severe and multiple disabilities. I am seeking system approval for classroom special education teachers upon the approval of the building level administrator and the informed consent of the teachers and students, to participate in the study during the fall and or spring semester of 2011-2012.

As part of the study, all of the teachers who gain approval and agree to participate will gain knowledge by a) team meetings employing Universal Design for Learning Strategies, b) adapted materials, c) complete a questionnaire about generalization, and d) evidence towards extended standards in literacy. The researcher will implement the strategies during literacy instruction for 2 to 3 days a week for 10-14 weeks.

If you have any questions or concerns about this study, or would like additional information to assist you in reaching a decision about allowing teachers in your system to participate, please contact me, Cindy Lee, at (205) 333-0186. I am willing to meet with you in person or discuss your concerns by telephone.

If you have questions about your rights as a person taking part in a research study, make suggestions or file complaints and concerns, you may call Ms. Tanta Myles, the Research Compliance Officer of the University of Alabama at (205) 348-8461 or toll-free at 1-877-820-3066. You may also ask questions, make suggestions, or file complaint and concerns through the IRB Outreach Website at http://osp.ua.edu/site/PRCO_Welcome.html. You may email us at participantsoutreach@bama.ua.edu

I want to thank you in advance for allowing me the opportunity to spend time with your teachers and students. I also want to thank you for your consideration of this important research project regarding instruction for students with severe and multiple disabilities.

Sincerely,

Cynthia D. Lee, EdS, N.B.C.
Special Education and Multiple Abilities Program, College of Education
The University of Alabama

APPENDIX E

LETTERS TO SCHOOL-LEVEL ADMINISTRATORS

Ms. Rebecca Brown

[redacted]

November 2, 2011

Dear Ms. Rebecca Brown,

I am a doctoral student in the Department of Special Education and Multiple Abilities Program at The University of Alabama conducting research under the supervision of Dr. Mary Beirne-Smith. The purpose of my research is to explore the results of employing a task analysis during literacy instruction in an effort to identify successful strategies for students with severe and multiple disabilities. I am seeking system approval for classroom special education teachers upon the approval of the building level administrator and the informed consent of the teachers and students, to participate in the study during the fall and or spring semester of 2011-2012.

As part of the study, all of the teachers who gain approval and agree to participate will gain knowledge by a) team meetings employing Universal Design for Learning Strategies, b) adapted materials, c) complete a questionnaire about generalization, and d) evidence towards extended standards in literacy. The researcher will implement the strategies during literacy instruction for 2 to 3 days a week for 10-14 weeks.

If you have any questions or concerns about this study, or would like additional information to assist you in reaching a decision about allowing teachers in your system to participate, please contact me, Cindy Lee, at (205) 333-0186. I am willing to meet with you in person or discuss your concerns by telephone.

If you have questions about your rights as a person taking part in a research study, make suggestions or file complaints and concerns, you may call Ms. Tanta Myles, the Research Compliance Officer of the University of Alabama at (205)348-8461 or toll-free at 1-877-820-3066. You may also ask questions, make suggestions, or file complaint and concerns through the IRB Outreach Website at http://osp.ua.edu/site/PRCO_Welcome.html. You may email us at participantsoutreach@bama.ua.edu

I want to thank you in advance for allowing me the opportunity to spend time with your teachers and students. I also want to thank you for your consideration of this important research project regarding instruction for students with severe and multiple disabilities.

By signing this letter you are providing support for the researcher to conduct this research project in your school.

[redacted]

Signature of principal

Sincerely,

Cynthia D. Lee, EdS, N.B.C.
Special Education and Multiple Abilities Program, College of Education
The University of Alabama

Mrs. Janet Sherrod

[redacted]

November 8, 2011

Dear Mrs. Janet Sherrod,

I am a doctoral student in the Department of Special Education and Multiple Abilities Program at The University of Alabama conducting research under the supervision of Dr. Mary Beirne-Smith. The purpose of my research is to explore the results of employing a task analysis during literacy instruction in an effort to identify successful strategies for students with severe and multiple disabilities. I am seeking system approval for classroom special education teachers upon the approval of the building level administrator and the informed consent of the teachers and students, to participate in the study during the fall and or spring semester of 2011-2012.

As part of the study, all of the teachers who gain approval and agree to participate will gain knowledge by a) team meetings employing Universal Design for Learning Strategies, b) adapted materials, c) complete a questionnaire about generalization, and d) evidence towards extended standards in literacy. The researcher will implement the strategies during literacy instruction for 2 to 3 days a week for 10-14 weeks.

If you have any questions or concerns about this study, or would like additional information to assist you in reaching a decision about allowing teachers in your system to participate, please contact me, Cindy Lee, at (205) 333-0186. I am willing to meet with you in person or discuss your concerns by telephone.

If you have questions about your rights as a person taking part in a research study, make suggestions or file complaints and concerns, you may call Ms. Tanta Myles, the Research Compliance Officer of the University of Alabama at (205)348-8461 or toll-free at 1-877-820-3066. You may also ask questions, make suggestions, or file complaint and concerns through the IRB Outreach Website at http://osp.ua.edu/site/PRCO_Welcome.html. You may email us at participantsoutreach@bama.ua.edu

I want to thank you in advance for allowing me the opportunity to spend time with your teachers and students. I also want to thank you for your consideration of this important research project regarding instruction for students with severe and multiple disabilities.

By signing this letter you are providing support for the researcher to conduct this research project in your school.

[redacted]

Signature of principal

Sincerely,

Cynthia D. Lee, EdS, N.B.C.
Special Education and Multiple Abilities Program, College of Education
The University of Alabama

[Place School System Administrator here]
[Place School System Address here]
[Place date here]

Place Dear School System Administrator here]:

I am a doctoral student in the Department of Special Education and Multiple Abilities Program at The University of Alabama conducting research under the supervision of Dr. Mary Beirne-Smith. The purpose of my research is to explore the results of employing a task analysis during literacy instruction in an effort to identify successful strategies for students with severe and multiple disabilities. I am seeking system approval for classroom special education teachers upon the approval of the building level administrator and the informed consent of the teachers and students, to participate in the study during the fall and or spring semester of 2011-2012.

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Sincerely,

Cynthia D. Lee, EdS, N.B.C.
Special Education and Multiple Abilities Program, College of Education
The University of Alabama

APPENDIX F

PARENT AND STUDENT CONSENT/ASSENT FORMS

Dear (Parent or Legal Guardian of Participant),

I am a doctoral student in the Department of Special Education at The University of Alabama. I am conducting a research study at your child's school that involves special reading lessons using toys and pictures to help students answer questions. This lesson will be taught in your child's classroom three days a week for up to 12 weeks during normal reading time and will not add any time to your child's school day. My research study is approved by your child's principal, as well as The University of Alabama Institutional Review Board. I am writing to ask your permission for your child to participate in my research study. Additional details about the study are included in the enclosed consent form.

This type of reading lesson has been proven to help children with reading skills and give them a way to answer questions correctly. The reading lessons will be videotaped so that I can review the tapes with your child's teacher. Nobody but myself and the classroom teacher will be able to watch the tapes and they will be erased after the study is complete.

If you have any questions about this study, or would like more information feel free to contact me, Cynthia Lee, at (205) 333-0186. As part of the lesson a meeting will be held between myself, the classroom teacher, and other school personnel who interact with your child. You will be invited to this meeting, but are not required to come.

Please read the enclosed consent form carefully, sign and return it in the enclosed envelope. Please note that all children in the class will participate in the reading lesson. However, allowing your child to participate in the research study is completely voluntary. Thanks for your consideration.

Sincerely,

Cynthia D. Lee, EdS, N.B.C.
Special Education and Multiple Abilities Program, College of Education
The University of Alabama

AAHRPP DOCUMENT #192

UNIVERSITY OF ALABAMA
HUMAN RESEARCH PROTECTION PROGRAM

Informed Consent for a Non-Medical Study

Study title: Teaching students with severe and multiple disabilities: The implementation of shared stories.
Cynthia D. Lee, Primary Investigator, Doctoral Student
Your child is being asked to take part in a study. The study is being done by Cynthia D Lee, who is a doctoral student in special education at The University of Alabama. Mrs. Lee is a retired special education teacher with over 25 years experience. Mrs. Lee is being supervised by Dr. Mary Beirne-Smith who is a professor of special education at The University of Alabama.

What is this study about? What is the investigator trying to learn?
This study is being done to find out if planning for all students in the classroom before the lesson increases students' correct responses during shared story reading.

Why is this study important or useful?
This information is important because special educators need to learn and use more interventions that are good and helpful in order to improve instruction in the general education curriculum. The results will help special educators understand better ways to help students with severe and multiple disabilities participate in reading instruction.

Why has my child been asked to be in this study?
Your child has been asked to be in this study because of attendance in a special education classroom at your child's school. Your child is considered nonverbal (less than 100 word vocabulary).

How many people will be in this study?
The literature lesson will be presented to all students in the classrooms who have returned signed consent forms. The small group will consist of no more than 30 students.

What will my child be asked to do in this study?
Your child will participate in the class' regularly scheduled reading lessons with the researcher presenting the lesson three days a week for up to 40 minutes. Your child will be provided with toys and pictures, which will increase independent responses to the reading lessons. I would like to videotape in order to record and score your child's responses to questions about books read during the lessons.

How much time will my child spend being in this study?

Every student in the class will participate in regularly scheduled reading lessons, which may last up to 40 minutes. This is part of your child's Individualized Education Plan. Students who have permission to participate will spend an additional 10 minutes answering questions about the reading lessons. The lessons will be taught 3 days per week over a period of 12 weeks.

Will being in this study cost me anything?
There will be no cost to you for your child to participate in this study.

Will I be compensated for being in this study?
You or your child will not be paid for being in this study.

What are the risks (dangers or harms) to my child if my child is in this study?
The risks of the proposed study are no greater than those encountered in everyday school life. The study involves educational interventions similar to those presented in the classroom's regularly scheduled reading lessons.

What are the benefits (good things) that may happen if my child is in this study?
There are no direct benefits to your child. However, your child's ability to participate in reading instruction in the classroom might be improved by having toys and pictures available that relate to the stories.

What are the benefits to science or society?
This study will help special educators to be more helpful to students with severe and multiple disabilities in participating in the general education curriculum (e.g., reading instruction).

How will my child's privacy be protected?
The videotaped lessons will be kept by the Primary Investigator and shown to the classroom teacher to record and score the participants' responses to the task analysis. All reasonable efforts will be made to videotape only study participants; however, no guarantees can be made that a non-study participant will not be accidently videotaped. In the event a non-study participant is accidently recorded no data will be used for the study. All videotaped lessons will be reviewed in the special education classroom or other private and secure room. The videotapes will be destroyed within one year of the completion of the study.

How will my child's confidentiality be protected?
The videotapes and data from task analysis will be kept in a locked filing cabinet at the Primary Investigator's home office and will not be shared with those not directly involved in implementing the study. Any articles or data written about the study will refer to your child with a code (e.g., participant 1, student 1). You child's name will not be reported in the study's reports. The videotaped lessons will be retained by the Primary Investigator and shown to the team planning members to record and score the participants' responses to the task analysis. The videotaped lessons will be reviewed in the special education classroom or other private and secure room. The videotapes will be destroyed within one year of the completion of the study.

What are the alternatives to being in this study? Do I have other choices?
The alternative or other choice to being in this study is not to participate. There will be no effect on your relations with your child's school.

What are my rights as a participant in this study?
Taking part in this study is voluntary. It is your free choice. You can refuse to be in it at all. If your child starts the study and decides not to continue he/she can stop at any time.

The University of Alabama Institutional Review Board ("the IRB") is the committee that protects the rights of people in research studies. The IRB may review study records from time to time to be sure that people in research studies are being treated fairly and that the study is being carried out as planned.

Who do I call if I have questions or problems?
If you have questions, concerns, or complaints about the study later on, please call Cynthia Lee at (205) 333-0186.
If you have questions about your rights as a person in a research study, call Ms. Tanta Myles, the Research Compliance Officer of the University, at 205-348-8461 or toll-free at 1-877-820-3066.

You may also ask questions, make suggestions, or file complaints and concerns through the IRB Outreach website at http://osp.ua.edu/site/PRCO_Welcome.html or email us at participantoutreach@bama.ua.edu.

After you participate, you are encouraged to complete the survey for research participants that is online at the outreach website or you may ask the investigator for a copy of it and mail it to the University Office for Research Compliance, Box 870127, 358 Rose Administration Building, Tuscaloosa, AL 35487-0127.

I have read this consent form. I have had a chance to ask questions. I agree to take part in it. I will receive a copy of this consent form to keep.

_____My Child HAS permission to participate in this research study, which will include videotaping my child during the lessons.

_____ My Child DOES NOT have permission to participate in this research study

_____

Signature of Research Participant's Parent/Legal Guardian Date

_____

Signature of Investigator Date

STUDY PARTICIPANT'S ASSENT

Hi (student's name). My name is Mrs. Cynthia Lee. I go to school at The University of Alabama. I am doing a study to help students read books. You are in Mrs. (teacher's name) class so I asking if you would like to be in my study.

Here is what will happen. I will read a story to your class. You will answer questions about the story using toys and pictures. It will take about 30 minutes. Most kids think that reading like this is fun.

Your parents know that I am asking you to do this and it is okay with them.

I will video tape the reading and only your teacher and myself will watch it.

If something makes you feel bad while reading please tell me. If you decide you do not like our reading you can stop at anytime.

Do you have any questions about this? You can ask me right now.

Do you think you would like to read with me and your class?

YES NO

_____ _____

Signature of Person Obtaining Assent Date

Dear (Parent or Legal Guardian of Non-Study Participant),

I am a doctoral student in the Department of Special Education at The University of Alabama. I am teaching special reading lessons using toys and pictures to help students answer questions as part of a research project. This lesson will be taught in your child's classroom and will not add any time to your child's school day. The lessons will be taught during normal reading time 3 days a week for up to 12 weeks. My research study is approved by your child's principal, as well as The University of Alabama Institutional Review Board.

This type of reading lesson has been proven to help children with reading skills and give them a way to answer questions correctly. The reading lessons will be videotaped so that I can review the tapes with your child's teacher. Your child will not be videotaped on purpose but may accidentally get into the picture. Nobody but myself and the classroom teacher will be able to watch the tapes and they will be destroyed after the study is complete.

If you have questions about your rights as a person taking part in a research study, make suggestions or file complaints and concerns, you may call Ms. Tanta Myles, the Research Compliance Officer of the University of Alabama at (205) 348-8461 or toll-free at 1-877-820-3066. You may also ask questions, make suggestions, or file complaint and concerns through the IRB Outreach Website at http://osp.ua.edu/site/PRCO_Welcome.html. You may email us at participantsoutreach@bama.ua.edu.

If you have any questions about this study, or would like additional information feel free to contact me, Cindy Lee, at (205) 333-0186. Enclose is a consent form. Please read it carefully, sign and return it in the enclosed envelope. Allowing your child to participate in these lessons is completely voluntary. Thanks for your help.

Sincerely,

Cynthia D. Lee, EdS, N.B.C.
Special Education and Multiple Abilities Program, College of Education
The University of Alabama

I have read this consent form. I have had a chance to ask questions. I agree to take part in it. I will receive a copy of this consent form to keep.

_____My Child HAS permission to participate in this reading lesson research study, which could include videotaping my child during the lessons.

_____ My Child DOES NOT have permission to participate in this reading lesson research study

_____

Signature of Non-study Participant's Parent/Legal Guardian Date

_____

Signature of Investigator Date

APPENDIX G

TASK ANALYSIS SCORING SHEET

NAME_____ BOOK_____ DATE_____

CIRCLE THE SYMBOL THAT CORRESPONDS TO THE PARTICIPANT'S RESPONSE

Task Analysis Steps	**Code** **NR No Response** **+ Independent Correct** **R Reaction** **- Incorrect Response**	**Code** **NR No Response** **+ Independent Correct** **R Reaction** **- Incorrect Response**	Comments
1 Choose a book	**NR** **+** **R**		
2 Attend to book	**NR** **+** **R**		
3 Attend to material	**NR** **+** **R**		
4 Prediction w/ 2 object	**NR** **+** **R** **-**		
5, 8, 11 React to name	**NR** **NR** **NR** **+** **+** **+** **R** **R** **R**		
6, 9, 12 Focus on object	**NR** **NR** **NR** **+** **+** **+** **R** **R** **R**		
7, 10, 13 Completes storyline	**NR** **NR** **NR** **+** **+** **+** **R** **R** **R**		
14 React to surprise	**NR** **+** **R**		
15 Comprehension w/ 2 objects	**NR** **+** **R** **-**		
16 Read again?	**NR** **+** **R**		

RATER _____ (Browder, Mims, Spooner, Ahlgrim-Delzell, & Lee, 2007)

APPENDIX H

SCORING RUBRIC FOR TASK ANALYSIS FOR SHARED STORIES

SCORING RUBRIC FOR TASK ANALYSIS FOR SHARED STORIES

ALSDE RUBRIC FOR AAA	Describing words	Scores on the Task Analysis for Shared Stories
0-25%	Does not meet academic content standards	0-4
ABOVE 25%-50%	Partially meets academic content standards	Above 4-8
ABOVE 50%-75%	Meets academic content standards	Above 8-12
ABOVE 75%-100%	Exceeds academic content standards	Above 12 -16

(Morton, 2006; Morton, 2011; Quenemoen et al., 2010**)**