Literacy Supporting Communication Development for Children with Congenital Deafblindness

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LITERACY SUPPORTING COMMUNICATION DEVELOPMENT FOR CHILDREN WITH CONGENITAL DEAFBLINDNESS

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ABSTRACT

Literacy Supporting Communication Development for Children With Congenital Deafblindness

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The effects of deafblindness are much greater than simply combining the effects of the individual's vision loss with the effects of their hearing loss, because these senses strongly support one another (Silberman, Bruce, & Nelson, 2004). Even though most individuals have some residual vision and hearing, deafblindness limits access to the environment, resulting in a distorted perception of the immediate surroundings (van Dijk, Janssen, & Nelson, 2001). The implications greatly limit the individual's opportunities for incidental learning and significantly impact the individual's language and communication development (Bruce, 2005; Miles & Riggio, 1999). For children with deafblindness, there is a strong connection between literacy and communication, since engaging in accessible literacy activities can support learning and communication development (Downing, 2005b). When understood as exchanging information with others in a variety of ways based on personal experiences, literacy has inherent communicative and social components (Bruce et al., 2004).

This qualitative research study investigated how teachers were implementing read alouds for children with congenital deafblindness, as well as teacher's understandings regarding the relationship between communication and literacy for individuals with deafblindness. Three case studies were conducted, followed a cross-case analysis to

determine prominent themes that emerged from the observation, interview and field note data. Results included the emergence of themes related to teacher beliefs, instructional strategies and the learning environment across cases. The major theme that emerged for teacher beliefs was a shared understanding of the connection between communication and literacy for children with deafblindness, and the minor theme was comprehensive understanding of deafblindness. Major themes that emerged for instructional strategies were the use of total communication with different levels of representation, communication modeling, and positive reinforcement, as well as the minor theme of formative assessment. Finally, for the learning environment, a major theme of adapted materials emerged, as well as a minor theme of technology.

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CHAPTER ONE

INTRODUCTION

Children with congenital deafblindness, a combined vision and hearing loss at birth, often face many challenges as a result of their sensory losses. The effects of these coexisting losses are greater than simply combining the effects of the hearing loss and the effects of the vision loss, as these senses strongly support one another (Silberman, Bruce, & Nelson, 2004). Congenital deafblindness leaves children with a distorted perception of their surroundings, even with residual vision and hearing abilities (van Dijk, Janssen, & Nelson, 2001). Typically, these individuals also experience intellectual and physical disabilities, which further affects the individual's overall functioning, particularly in communication and language (Bruce, 2005; Siegel-Causey & Bashinski, 1997). Additionally, these implications also hinder the individual's chances for incidental learning, since the child may struggle to access most of the information in their immediate environment (Bruce, 2002; Miles & Riggio, 1999).

Deafblindness is defined as a concomittant vision loss and hearing loss, but most often individuals have some degree of functional residual vision and hearing, while typically also having severe intellectual disability, cerebral palsy, and microcephaly (Heller, Forney, Alberto, Best & Schwartzman, 2009). In 2014, the National Center on Deaf-Blindness (NCDB) served 9,384 individuals with deafblindness, and among those individuals less than 5% were completely blind, less than 8% had a profound hearing loss and approximately 80% experienced one or more additional disabilities (National Center on Deaf-Blindness, 2015). Additionally, 84% of the individuals identified in 2014 received special education services.

Individuals with congenital deafblindness have different life experiences when compared to their typically developing peers as the implications of their disability often result in the individual requiring increased medical care, partial or total assistance with their self-care needs and greater therapeutic needs (Bruce, 2011). These individuals communicate in different ways, with the specific strategies they use being influenced by their residual levels of vision/hearing, in addition to other implications they may have, such as intellectual and physical disabilities (Bruce, 2002). Communication and language are essential areas of development for children with concomitant vision and hearing loss, because they are highly affected by the loss of these senses (Bruce, 2005). Regardless of its level of complexity, communication is an essential means of self-expression, allowing individuals with deafblindness to make connections with their surroundings and interact socially with others (Miles & Riggio, 1999).

Language and Literacy Development

Language development, according to Piaget (1969), can serve as the theoretical basis for the developmental process of communication in children with deafblindness. Cognitive structures that support intellectual development are developed through meaningful early "sensorimotor" experiences. Over time, the child starts to refine their primitive reflexes and imitate the interactions they have with the world. Vision and hearing are critical channels for sensory input to support this incidental learning. Eventually objects are incorporated into the child's repertoire of imitation as the child reaches the level of representation (Piaget, 1962).

Moving forward, according to developmental psychologists Werner & Kaplan (1988), the child now begins to gain a more sophisticated understanding of language, using

symbols as a vehicle for the representation of a specific content or idea. Distancing occurs during this phase, as the child begins to understand itself as separate from communication partner, the symbol being used for representation and the actual referent, (also know as the object of reference). As the knowledge of the relationship of these components matures, it allows the child a stronger means of sharing ideas with a greater number of individuals and away from the immediate context (Werner & Kaplan, 1963). Gestures and vocalizations begin to emerge as the individual advances from body movements that imitate an action or experience (Stillman & Battle, 1984). Key to this stage of development is the child's communication partner, who provides the individual with the security and confidence needed to engage with their surroundings and eventually, support the individual to engage with a broader array of partners, as they utilize more widely understood symbols, the abstract sign or label connecting to the object of reference (Werner & Kaplan, 1963).

Also understanding language as a developmental process, van Dijk (1967) expanded the previously mentioned work of Werner and Kaplan (1963, 1967) to be more specific to children with deafblindness. Opportunities for incidental learning are greatly impacted by the limited visual and auditory information being received, resulting in a lack of understanding regarding the relationship symbols have to the environment (van Dijk, 1967). However, acquiring a knowledge of symbols allows them to gain meaning from their environment and control of their experiences, in addition to providing structure and meaning to their world (van Dijk, 1966).

Language development for children with deafblindness begins by directing the child's internal world outward through co-active movements between them and their communication partner (van Dijk, 1967). Engaging in movement together allows the child

to not only develop a trusting relationship with another individual, but also to being to access, explore and experience their surroundings. As the communication partner responds to the child's movements within a predictable sequence of actions, eventually anticipation is developed as together they engage in a shared experience (van Dijk, 2002). When objects are incorporated into the movement repertoire, symbolic understanding begins to develop as the child understands these "things of action" to be separate from themselves (Werner & Kaplan, 1963). Symbolic understanding also allows the child to extend their topic of conversation outside of the immediate situation, while also providing access to a greater number of communication partners (van Dijk, 1967).

Rowland and Schweigert (1989) established a seven level schema for communication development. As the child progresses in their symbolic development, they move through a series of stages where their communication matures from reactive responses to stimuli to an intentional and purposeful communicative act (Rowland & Schweigert, 1989). The child first uses unconventional forms of communication as communicative intent starts to develop, but across the seven levels can progress to concrete or tangible symbols up to combining multiple abstract symbols for communication (Rowland & Schweigert, 2000). Advancing an individual with deafblindness from non-symbolic to symbolic communication can be difficult (Bruce, 2005; Siegel-Causey & Downing, 1987); however, tangible symbols (iconic concrete representations) not only have the potential to move an individual towards symbolic communication (Rowland & Schweigert, 2000), but also decrease unwanted disruptive behaviors the individual may be demonstrating by providing a means of functional communication (Trief, 2007). Tangible symbols allow the individual to use representations to make choices and can become part

of their individual communication repertoire that may include gestures, body movements and manual signs (Trief, Bruce, Cascella, & Ivy, 2009).

Intervention frameworks exist to support communication development for children moving toward symbolic communication such as the Tri-focus Framework (Siegel-Causey and Bashinski, 1997). This framework focuses on the individual learning to communicate as well as important related factors that may affect communication development, such as the communication partner with whom the child is interacting with and the context where this is taking place. These components are related and greatly impacted by one another, with changes to one affecting the other two. Within each component, there are particular areas of focus. For example, when looking at the child, multiple areas of functioning are considered, such as levels of alertness and engagement (Guess & Siegel-Causey, 1995), level of symbolic understanding (Rowland &Schweigert, 1989) and the presence of less desirable or challenging behavior (Trief, 2007). When considering the communication partner, attention is given to their ability to recognize and appropriately respond to an intentional communication act the child may produce. This is especially important for learner's with deafblindness, as their communicative behaviors may be highly idiosyncratic and contextualized and easily missed by an unfamiliar partner (Brady & Bashinski, 2009; Snell, 2002). Appropriate responses may include supplementing the child's message with objects/symbols/gestures for clarity, providing opportunities for choice making and creating meaningful opportunities for a communication interaction to take place (Siegel-Causey & Bashinski, 1997). Lastly, the Tri-focus Framework looks at the setting where the interaction is taking place. This extends beyond the physical setting

to include and materials that are used during the interaction, as well as having a setting that is familiar and supportive to promote communication.

A related intervention framework is the Four Aspects of Communication (Bruce, 2002). Similar to the Tri-focus Framework, the Four Aspects recognizes that the communication between the individual and their communication partner to be important, in additional to the setting where the interaction is taking place; however, it extends to also include the specific ways the individual is using to express themselves. The specific aspects of the framework include the communication form, function, content and context (Bruce, 2002). The individual uses a communication form (sign, gesture, symbol) to send a specific content or message, which serves a specific function or purpose. This all takes place within a context that includes the individual, their partner, the physical space, sensory stimuli and any materials being used. Here the context has the most influence over the other aspects, as any changes can greatly affect the other components.

Both the Tri-focus Framework and Four Aspects of Communication look at the interaction between the communication partner and the individual communicating; however, a related model take this dynamic further to look at the relationship between these two individuals and its importance on supporting a communicative interaction. Janssen, Riksen-Walraven and van Dijk (2003b, 2006) consider the necessary relationship between the learner with deafblindness and their teacher for communication development to occur as a "harmonious interaction". Here, the communication partner is constantly modifying the environment where the communicative interaction is taking place so that they can remain "attuned" with the communication attempts of the child and respond accordingly (Janssen et al., 2003b). Under this model, the child is engaged in highly

preferred activities with a familiar and favored individual and they interact though a familiar physical activity or object. When the communication partner is appropriately responding to the communication signals of a child with deafblindness through a harmonious interaction, not only have increases in communication been observed, but also decreases in aberrant behavior (Janssen, Riksen-Walraven, & van dijk, 2002).

These communication intervention models are critical for children with deafblindness as communication and concept development are critical areas of learning for this population due to the decreased opportunities for incidental learning they find accessible because of the environmental information that is lost from their concomitant vision and hearing losses (Bruce, Goldbold, & Naponelli-Gold, 2004). For typically developing children, these early communicative functions are learned through observing and interacting with others. However, because children with deafblindness are lacking these opportunities, they must be intentionally and systematically taught these skills through engaging, tangible, and meaningful activities (Bruce, 2005).

For children with deafblindness, there is a strong connection between literacy and communication, since engaging in accessible literacy activities can support learning and communication development (Downing, 2005b). When understood as exchanging information with others in a variety of ways based on personal experiences, literacy has inherent communicative and social components (Bruce et al., 2004). In the past, individuals with complex support needs were assumed to be "naturally illiterate" and thought to lack the ability to comprehend or be able to benefit from opportunities to engage with texts (Kliewer et al., 2004). However, contemporary research has demonstrated that these individuals can experience short and long term benefits to their quality of life when

provided with opportunities to interact over and gain meaning from text (Browder et al., 2009). Literacy allows one to access information outside of the immediate context, share their own experiences and become an active member of their environment (Miles & Riggio, 1999).

Typically, literacy can be conceptualized using reading and writing to convey information to others. When considering a definition of literacy for individuals with deafblindness, this definition must be extended beyond reading and writing text to the social process of exchanging various representations for communication (Ferrell, Bruce & Luckner, 2014). There is very limited research on literacy instruction for this population, and its potential benefit is still unknown as research continues to emerge in this area (Baker, Spooner, Ahlgrim-Delzell, Flowers, & Browder, 2010). However, legislation such as *Individuals with Disabilities Education Act* (2004) and *No Child Left Behind* (2002) mandate that all children engage in literacy instruction and make annual progress. Lastly, this lack of research can limit teachers' abilities to create meaningful learning contexts for children with congenital deafblindness that provide access to literacy instruction, further develop their communication abilities and ultimately enhance their quality of life (Cooper-Duffy, Szedia, & Hyer, 2010).

Rationale for this Study

Because of the important connection between communication and literacy that exists for individuals who are deafblind and the lack of research on this topic, exploring this topic further is an important area of investigation. The lack of knowledge on this topic can be realized when considering the discrepancies that can exist between a teacher's understanding of what literacy is for a student who is deafblind and the accommodations,

teaching strategies and assessments used for literacy instruction currently being utilized in the classroom for this population (Miles, 2005). Therefore, the current investigation aims to explore how communication and literacy skills are being developed within the context of a classroom-based reading lesson, in addition to how teachers' beliefs related to communication and literacy development influence the strategies they employ during this activity.

Current Investigation

This research aims to further explore the connection between literacy and communication development for individuals with congenital deafblindness to further understand how communication and literacy skill development can occur within the context of a classroom-based read aloud activity. Frameworks for communication development for individuals with multiple disabilities, such as the Tri-Focus Framework (Siegel-Causey and Bashinski, 1997), and specifically for those with deafblindness, such as the Four Aspects of Communication (Bruce, 2002) and the Diagnostic Intervention Model (Janssen, Riksen-Walraven & van Dijk, 2004) will be used as a foundation for this research, as they serve as pivotal frameworks for teaching individuals with deafblindness. Additionally, research on literacy for individuals with multiple disabilities (Downing, 2005, 2005b; Browder, Lee & Mims, 2011; Mims, Hudson & Browder, 2012) and literacy for individuals who are deafblind (Miles & Riggio, 1999; Bruce, et al, 2004) will support the analysis of the instructional strategies being implemented. Specifically, this investigation will look to answer following research questions:

(1) How do teachers use classroom-based read alouds to support communication and literacy development for their students with congenital deafblindness?

    i. How is the learning environment being utilized during the lesson?

(2) How do teachers' beliefs about communication and literacy development for children with congenital deafblindness influence the instructional approach strategies they use during a classroom-based read aloud?

Unique Contribution of this Research

Communication and language development are critical areas of development for individuals with deafblindness (Bruce, 2005). When the definition of literacy is expanded beyond reading and writing text to exchanging various representations, there is a strong connection between communication and literacy (Bruce et al, 2004). Currently, the benefits that come from literacy instruction for individuals with deafblindness have yet to be fully realized as research is still emerging in this area (McKenzie, 2009).

Because there is a lack of research related to literacy for individuals with deafblindness, this study looks to explore how communication and literacy skills are developed within the context of a traditional literacy lesson, a read aloud. Specifically, this study will explore the instructional strategies the teachers are using during their instruction for their students with deafblindness. Additionally, this study seeks to gain a more in-depth understanding of each teacher's beliefs about communication and literacy instruction for

this unique group of learners and also determine how these beliefs influence their instruction.

Overview of Upcoming Chapters

The relevant research literature pertaining to communication and literacy development for individuals with deafblindness will be presented in chapter two. This includes the theoretical basis for communication development according to Piaget (1962) and frameworks pertaining to communication development (Siegel-Causey and Bashinski, 1997; Bruce, 2002; Janssen, Riksen-Walraven & van Dijk, 2004) and literacy development (Miles & Riggio, 1999; Bruce, et al, 2004l; Downing, 2005, 2005b; Browder, Lee & Mims, 2011; Mims, Hudson & Browder, 2012). Chapter three will include a description of how a collective case study design will answer the research questions presented, as well as participant descriptions, data collection techniques and methods of analysis. In chapter four the results from each case study and from the cross-case analysis will be presented, followed by a discussion of the findings. Chapter five will include the conclusions as well as the implications for practice and future research.

List of terms

Augmentative and Alternative Communication: (AAC) "a set of procedures and processes by which an individual's communication skills (i.e., production as well as comprehension) can be maximized for functional and effective communication. It involves supplementing or replacing natural speech and/or writing with aided (e.g., picture communication symbols, line drawings, Blissymbols, and tangible objects) and/or unaided symbols (e.g., manual signs, gestures, and finger spelling)." (American Speech-Language-Hearing Association, 2002, Definitions section, para. 2).

Coactive movement: mutual engagement in a predictable sequence of movements between a child with deafblindness and their communication partner where both individuals are attending to and responding to the others movements (van Dijk, 1967)

Communication: the exchange of information from one individual to another (Miles & Riggio, 1999)

Congenital deafblindness: concomitant vision and hearing loss present at birth. The implications of deafblindness are greater than simply combining the implications of a hearing loss with those of a visual impairment

Content of Communication: the message being communicated

Context of communication: where the communication exchange occurs, including the physical environment, communication partners, individual's characteristics and the activity that is taking place

Distancing: polarization between: the individual and communication partner; the individual and object of reference; the individual and the symbolic vehicle; and, the object and the symbolic vehicle.

Four Aspects of Communication: The relationship between the form, function and content of communication within a structured context (Bruce, 2002).

Form of communication: mode or way of communicating

Function of communication: the purpose or reason for communicating

Harmonious interactions: Responsive, supportive and trusting interactions between an individual with deafblindness and their communication partner (Janssen, Riksen-Walraven, & van dijk, 2002).

Icon: a sign or label that shares physical characteristics with its referent, without a functional component (Park, 1997).

Index: a sign or label that shares physical characteristics and functional components with its referent (Park, 1997).

Intervener: a dedicated 1:1 teacher's aide with special training in deafblindness.

Literacy: the social process of exchanging various representations for communication (Ferrell, Bruce & Luckner, 2014).

Non-symbolic communication: communication without the use of symbols, such as through body movements, gestures and facial expressions

Objects of reference: the item/action that a symbol represents; also know as a symbol (Werner & Kaplan, 1988).

Referent: the item/action that a symbol represents; the object of reference (Werner & Kaplan, 1988).

Resonance movement: a movement-based activity of shared engagement with a child with deafblindness where their communication partner, in close proximity, engages with the child's movement repertoire to encourage the child to interact more with their environment (van Dijk, 1967)

Representation: icons, indices or symbols that refer to a specific referent (item or action)

Symbolic communication: the process of communicating using abstract representations or symbols with distance

Symbolic vehicle: the symbol (gesture, sign, icon, word) used to signify the referent; the symbol/representation employed in referential representation (Werner & Kaplan, 1988).

Symbol: a sign or label with an arbitrary/abstract connection to its referent, sharing no physical or functional connections (Park, 1997).

Tangible symbols/representations: objects of reference or iconic symbolic concrete representations.

Total Communication: using a combination of individually suitable/appropriate communicative forms for receptive and expressive purposes.

Tri-Focus Framework: a model for enhancing communication development with individual communicating without the use of symbols that takes into account the relationship between the individual, their communication partner and the environment where the interaction is taking place (Siegel-Causey & Bashinski, 1997).

CHAPTER TWO

LITERATURE REVIEW

Deafblindness is defined as "concomitant hearing and visual impairments, the combination of which causes such severe communication and other developmental and educational needs that they cannot be accommodated in special education programs solely for children with deafness or children with blindness" (34 CFR 300.8(c)(2), 2006). The effects of deafblindness are more than the implications of a vision loss joined with the implications of a hearing loss, as these distance senses closely support each other and strongly influence development and learning (Bruce, 2002; Siegel-Causey & Bashinski, 1997; Silberman et al., 2004). Even though many children with deafblindness have some amount of usable vision and or hearing, the combined sensory losses result in an altered and fragmented perception of the immediate environment (van Dijk et al., 2001). Children with congenital deafblindness frequently have additional physical and intellectual disabilities, which compound the severe impact deafblindness has on the individual's overall functioning, especially in the areas of communication and language (Bruce, 2005; Siegel-Causey & Downing, 1987; van Dijk, 1967). These factors also affect the individual's chances for incidental learning as most of the detailed information of the environment cannot be effectively accessed by the individual who is deafblind (Bruce, 2002; Miles & Riggio, 1999).

For children with congenital deafblindness, engaging in literacy activities has the potential to support learning and communication development, as literacy is strongly connected to communication for this population (Downing, 2005b). For this to be possible, traditional notions of literacy being the acts of reading and writing need to be expanded to

include a variety of interactions and representations (Miles, 2005). In the past, individuals with complex support needs were assumed to be "naturally illiterate" and thought to lack the ability to comprehend or be able to benefit from opportunities to engage with texts (Kliewer et al., 2004). However, contemporary research has demonstrated that these individuals can experience short and long term benefits to their quality of life when provided with opportunities to interact over and gain meaning from text (Browder et al., 2009). Literacy allows one to information outside of the immediate context, share their own experiences and become an active member of their environment (Miles & Riggio, 1999).

Communication

For individuals with deafblindness, communication and language development are seen as the critical areas of development, as they are the most impacted by the combination of vision and hearing losses, and in order to be effective, interventions must be consistent with the individual's level of communicative intent and symbolic understanding (Bruce, 2005). Language is abstract and complex communication. For individuals with congenital deafblindness, communication development is crucial at any level of sophistication, and it is essential the individual has other means of self-expression beyond language (Miles & Riggio, 1999). Essentially, communication provides prelinguistic individuals with congenital deafblindness an ability to make connections with the outside world, express themselves and grants them access to other individuals.

Theory

Developmental psychology looks to understand how cognition matures as children learn and make sense of the world around them (Mitchell, 1992). For children with

deafblindness, developmental theory has the power to explain their communication development, including the prerequisite milestones that serve as the foundation for later communication interventions (Bruce & Borders, 2015). Piaget (1969) explains that before language has developed, "each period of [the child's] development partly explains the periods that follow." (p.3). According to Piaget, there are four phases of child development, starting with the sensorimotor stage and progressing through the preoperational, concrete-operational and finally the formal operational stage. Early learning experiences serve as the building blocks for the development of the cognitive substructures that support and lead to perceptive and intellectual development within the "sensori-motor" period of development. "Sensori-motor intelligence is, in our view, the development of an assimilating activity which tends to incorporate external objects in its schemas while at the same time accommodating the schemas to the external world" (Piaget, 1962, p. 5). This involves imitation, as the child begins to interact with the external world. Additionally, during the sensorimotor stage object permanence is developed, as the child begins to recognize external objects and understand them to be separate from "self" (Mitchell, 1992). Symbolism in the area of communication is developed during the preoperational stage as the child begins to contemplate objects and actions, but has yet to develop the ability to problem solve, which develops during the concrete-operational stage, as the child's thinking becomes more objective and sophisticated (Mitchell, 1992). Lastly, the formal-operational stage is where systematic reasoning, as well as the ability to make inferences and generalize concepts, is achieved.

The development of imitation during the sensori-motor stage is critical for language development because it is not only where intentionality emerges, but because it also leads

into the development of symbolic representation (Piaget, 1962). Starting in stage I, the foundation for imitation begins to emerge as a reflex to an external stimulus. As the child's imitation schemas start to expand, stage II begins as they begin to discriminate and organize their reflexes into systematic "circular reactions" to an external stimulus, such a putting the thumb in their mouth. Here the child is beginning to use their vision and hearing to imitate actions and sounds. In stage III, the child's imitation is becoming more systematic as they begin to utilize more of the visual and auditory information they are receiving, but are still primarily reflexive, with the child only imitating previously familiar sounds and actions that s/he has seen. Stage IV is divided into two sub-stages as the child begins to acquire new imitation schemas: those that previously could not been seen and were acquired through association, and also new schemas that are a result of the coordination of previously acquired schemas and exploration of new movements that the child observes. Piaget (1962) explains that as the child begins to discover and understand objects in new way during stage V, their imitations become more precise and intentional as they experiment with coordinating new schemes that imitate parts of the body that are not visible to the child or sounds that have not been previously heard. Lastly, stage VI represents the child's ability to not only imitate novel actions or sounds, but to produce the new schemas without the model being present in the immediate environment for a period of time (distancing). "Imitation thus begins to reach the level of representation" (Piaget, 1962, p.62).

Symbolic Representation

Symbols serve as a means of representation. They represent form and meaning, while also describing a vehicle or medium that is being employed to represent a specific

content (Werner & Kaplan, 1963). Gaining an understanding of symbols, or symbolic representation, involves the relationship of four key components: the individual, the communication partner, object of reference or referent, and the symbolic vehicle being used to represent the actual object (Werner & Kaplan, 1988). Over time these components change by gaining autonomy from one another, known as distancing, with distance being established between the individual and communication partner, individual and object, and also in the degree of symbolic representation. As the individual's symbolic understanding matures, their access to communication partners broadens from highly familiar individuals, such as parents, to teachers and peers. Also involved in the change are the referents, which increase in complexity, while the symbolic vehicles, or the representations used to denote the object, become less unique to the individual and more widely understood by others. Thus, symbolic development involves not only the development of these four components, but also the changes that occur regarding the relationship between each of the components. Through this developmental process of change the notion of distancing occurs, which is described as, "a progressive distancing or polarization between person and object of reference, between person and symbolic vehicle, between symbolic vehicle and object, and between the persons in the communication situation" (Werner & Kaplan, 1988, p.8).

Before an understanding of symbols has developed, the child engages on a sensorimotor-affective level with their communication partner in a sharing situation initially related to an action and later to the exploration of an object (Werner & Kaplan, 1988). At this stage, knowing is doing, as the child is yet to see themself as a separate entity from the object that are engaging with, to them there is no distinction between self, object and environment (Stillman & Battle, 1984). Eventually, the child will want to

indicate to their partner a desire to explore or experience the object together, typically accomplished through the use of a sensorimotor action, such as turning toward or reaching for the item. At this stage, the child can only make reference to a tangible object present in the immediate context. Essentially, symbols serve as a vehicle or medium that allow access outside of the immediate context, as they represent characteristics of the object while also making reference to it (Werner & Kaplan, 1988). As temporal and spatial distancing occurs, symbolic vehicles allow the individual to make reference to something specific that is not immediately available in a manner that is understood by others.

Early representations are relevant only within the immediate context and not widely understood by others lacking an intimate understanding of the individual. However, over time as the individual's symbolic understanding begins to mature, distance between the individual and the object develops over time when "a fundamental transformation in the relation of person and object occurs with the shift from ego-bound things-of-action to ego-distant objects-of-contemplation" (Werner & Kaplan, 1963, p.44). Here the development of symbolic thought occurs as the initial understanding of the object itself being bound to a specific external sensorimotor-affective response is transformed into a "cognitive object" or schema related to the significance of the object separate from the individual. The child now understands the object as a separate entity with specific characteristics, spatially and temporally separate – "knowing is no longer bound to action" (Stillman & Battle, 1984, p. 161). The way the child engages with the object also changes as they start to display "co-active" or "resonant" movements where the reflexive sensorimotor response elicited by the object become responsive to the object, simultaneously occurring with the object or activity (Werner & Kaplan, 1963). As distance increases between the individual and the

symbolic vehicle, externally the symbol used matures from body movements that imitate the action or experience with the object, to a more functional medium to represent the referent, just as a specific gesture or vocalization, while internally the symbolic vehicle is less idiosyncratic and less individualized in meaning, as the individual now understands the separation between self and the object. Gradually, as symbolic development progresses, the symbolic vehicle becomes more generalized and less connected to the referent (also known as the object of reference), representing a category of objects with similar properties or characteristics.

The child's communication partner is also a key aspect to the development of symbolic understanding and within the process of distancing. The familiar partner supports the child by being a responsive and trustworthy component that provides the individual with the confidence to explore and engage with their surroundings (Stillman & Battle, 1984). Initially, the communication partner is someone closely connected to the child that understands the individualized symbolic vehicles the child is using to indicate specific referents. As distance, or polarization, occurs between the child and their communication partner, simultaneously distance is also occurring between the individual from referent, and from the symbolic vehicles and referents. This process is known as the "autonomization of symbols, that is, on the development toward a system if vehicles which enables a person to communicate adequately with an audience psychologically quite distant from the addressor" (Werner & Kaplan, 1963, p.49). In order for the child to distance physically and psychologically from a closely connected communication partner, they must begin to move beyond highly contextualized symbolic vehicles that are only understood by closely connected individuals toward a more sophisticated level of vehicle

that are more generalized and less contextualized so that they may be more widely understood and support communication with a less familiar partner.

The process of distancing between self and other is hindered for a child with deafblindness as vision and hearing allow for the clear establishment of self and separation from others (Bruce, 2005). Vision allows an individual to see others, see themselves and develop familiar and trusting relationships, while hearing allows them the chance to identify and separate the sounds they have produced from those that others have produced. Additionally, limited access to visual and auditory information inhibits children from clearly imitating the actions of others, which allows them the opportunity to experience how their own actions are alike or dissimilar from others (Bruce, 2005). Vision and hearing contribute to the distancing between child and referent, as well referent and symbolic vehicle.

Van Dijk.

Taking into consideration the impact of concomitant hearing and vision loss on communication development and the acquisition of symbolic understanding, Jan van Dijk refined the previously explained theory of symbolic development (Werner & Kaplan, 1963, 1988) for children with deafblindness. Also understanding language acquisition from a developmental perspective, van Dijk (1967) asserts that too often the unique communication signals of a child with deafblindness are misinterpreted as symbols, overestimating the individual's level of symbolic understanding and leading to communication interventions that are established on a false identification of skills, thus yielding very limited, if any, meaningful progression. The individual may then produce a "signal-behavior", where the child reacts to a stimulus by performing a signal without

understanding of its meaning or relevance (van Dijk, 1967). For children with deafblindness, gaining an understanding of symbols cannot be achieved simply through incidental learning, as access to the immediate environment is greatly hindered due to the limited visual and auditory receptive information. Before the development of symbolic understanding, a child with deafblindness exists in a "world in which symbols have no place: the world of immediacy" (van Dijk, 1967, p.88). Language adds structure and meaning to the individual's world, allowing them the opportunity to gain meaning from their environment – acquiring symbols provides control over the experiences they encounter (van Dijk, 1966).

According to van Dijk (1967), the basis for language and communication development starts with resonance and co-active movements between the adult and their communication partner. Here the child is able to begin directing their attention outward by meaningfully interacting with another individual, developing a sense of autonomy and gaining an understanding of the environment and their ability to elicit change within the immediate context (van Dijk, 1966). Without the opportunity to move and explore, the child is unable to acquire the experiences necessary for the development of language, which is "the instrument for symbolizing the concrete act" (van Dijk, 1967, p.91). Movement allows the child the opportunity to develop a trusting relationship with another individual and open themselves up to experiencing and making sense of the world around them. It's through movement that the child will come to produce a "natural symbol": a gesture that closely represents the action or item it represents, a crucial stage in language development (Stillman & Battle, 1984).

Resonance activities and coactive movements share many similarities, such as shared engagement in the child's repertoire of movements and an intention of bringing the child outward to engage with the environment; however, difference between the activities lie in the physical distance between the individual and their communication partner (van Dijk, 1966). There is close physical proximity between the individual and their communication partner during resonance activities, where as during co-active movements distance is established between the participants for the child to attend to the movements of their partner and respond to them with their own actions. In co-active movement the child is more independent of the adult, with a predictable sequence of movements eventually being established that will support the development of anticipation. As both engage each another in responsive movements, it also allows the child ad their communication to engage in a mutual game and to " dwell on a shared experience" (van Dijk, 2002).

As mentioned earlier, symbolic development begins as the child begins to move outward from their internal world and create distance from their caregiver, objects and the symbolic vehicles they utilize (Stillman & Battle, 1984). For an individual with deafblindness, emotions become associated with certain movements and produce a motor-movement response that eventually leads to the development of "things of action", as the individual begins to realize that the connection between objects and actions, or more simply stated, that you do things with objects (Werner & Kaplan, 1963). An example would be a child learning that the motion of throwing a ball serves as the symbolic vehicle for "ball". As the child gains an understanding of symbols, they move away from the "world-of-action" where motor patterns equate to objects and everything exists within the "immediacy", gaining an understanding of not only their own body, but also how concrete

things (objects, engagement in activities with others) can be distantly represented through a symbol, such as a gesture disconnected from the referent (van Dijk, 1966).

Being able to use symbols for communication allows one to expand their topics of conversation and opportunities for communication beyond the immediate context, which advances them towards more abstract thinking (van Dijk, 1967). The child can now communicate about more distant experiences, drawing from past experiences and previously learned representations, or vocabulary.

Levels of Communication

Rowland & Schweigert (1989, 2000) describe the Seven Levels of Communicative Competence, stating that interventions must first begin at a level the child understands before advancing to the more complex and abstract stages. Initially, at level I, a child's behavior is not yet intentional and must be interpreted by an outsider, and appears to be "reactive" and without awareness of any environmental factors (Mar & Sall, 1994). As the child begins to express these reactive behaviors with deliberate intent they move into Level II. Communicative intent arises at level III as the child attempts to use unconventional methods, specifically directed toward another person (Bruce, 2005). These behaviors are not yet symbolic, but are directly tied to the child's needs and wants (Mar & Sall, 1994). As more typical or "conventional" means are employed the child advances into Level IV, pre-symbolic conventional communication. Concrete representations emerge in Level V with tangible symbols. These symbols can be objects or pictures that can be easily handled, are easily identified and have a direct and easily understood connection to its referent (Rowland & Schweigert, 1989). In Level VI individual abstract symbols are used, such as

line drawings; and finally, in Level VII the individual uses multiple abstract symbols, which is the most advanced stage in the symbolic developmental process.

Tangible Representations and the Bridge to Symbolism

According to the Seven Levels of Communicative Competence, non-symbolic and symbolic communication meet between Levels IV and V (Rowland & Schweigert, 2000). However, advancing children with congenital deafblindness past non-symbolic communication into symbolic communication is an area of struggle many educators face (Bruce, 2005; Siegel-Causey & Downing, 1987). Rowland and Schweigert (1989) claim tangible representations to be the "bridge" between non-symbolic and symbolic communication. Tangible representations, the iconic symbolic concrete representations in Level V (Rowland & Schweigert, 2000), are described by Trief (2007) as not just a means of functional communication for individuals with deafblindness, but also a way to reduce aberrant behavior. This occurs when the representations are carefully selected as an iconic representation of an object or activity and then incorporated into an overall communication system that allows opportunities for the child to make choices, express their desires and also learn routines (Trief, 2007). These symbols can also be used simultaneously with unconventional/conventional gestures, body movements and sign language means of expression at other levels of symbolic representation as a part of an overall functional communication system (Trief, Bruce, Cascella, & Ivy, 2009).

Objects of Reference.

During the development of symbol use in communication development, children with deafblindness often struggle with making the connection between the representation or label and its referent, or transitioning from non-symbolic to symbolic communication.

Tangible symbols, or "objects of reference" can support this stage of symbolic development, and are classified as an index, icon or symbol, depending on how abstract or distant the representation is from the referent object or activity (Bruce, 2005). The most concrete object of reference is the icon, an object of reference that shares physical characteristics (visual, tactile, auditory, etc.) but lacks any functional connection to the referent. Here the icon serves as a tangible vehicle that is less cognitively demanding, not only supporting the transition between gestures and symbols, but also the development of anticipation for children with deafblindness. An index is a representation that is known by association and has a functional involvement within the activity it represents. By labeling an activity with a concrete object that is an integral part of the experience, an index can support the awareness of means-end relationships for individuals not yet demonstrating intentional communication. Symbolic development begins as the individual transitions from using an actual object functionally used with the activity to one that relates to the activity. The most complex and abstract object of reference is the symbol, an arbitrary representation with no resemblance to the referent.

Tri-Focus Framework

Siegel-Causey and Bashinski (1997) describe a model to enhance communication development for individuals with severe disabilities, including deafblindness, called the Tri-focus Framework. This multitier model is intended for individuals communicating at a non-symbolic level, placing importance on the individual, the person they are communicating with and the setting where the communication act is taking place. The authors describe how these three components influence and are impacted by one another. When looking at the individual learner, the Tri-focus framework takes into account

multiple areas of functioning, including the individual's level or state of awareness, level of communicative intent and symbolic understanding (i.e. Seven Levels of Communicative Competence per Rowland & Schweigert (1989), and any "challenging" behaviors the individuals may be expressing, as the authors believe these to be communicative expressions (Siegel-Causey & Bashinski, 1997).

The second area of focus under the Tri-focus framework is communication partner. This individual may be a teacher, parent or therapist and within the context of a familiar daily routine that recognizes when the learner is demonstrating a communicative act, identifies why they are attempting to communicate and then responds accordingly. Since individuals with congenital deafblindness often exhibit idiosyncratic communicative behaviors, a responsive partner is essential (Brady & Bashinski, 2009; Siegel-Causey & Guess, 1989; Snell, 2002). During an interaction, the communication partner is responsible to provide the child with congenital deafblindness with choices and opportunities based on the learner's preferences and level of understanding (Miles & Riggio, 1999). Additionally, the communication partner is responsible for supplementing the message the learner is attempting to express by incorporating objects, gestures or symbols to help support the message's accuracy, understanding and reference to the symbol (Siegel-Causey & Bashinski, 1997). An essential aspect of this part of the Tri-focus framework is the interaction taking place where communication partner is teaching the learner to convey a piece of information in a symbolic way that can be more readily understood by another person.

The final aspect of the Tri-focus framework focuses on the environmental context where the communicative interaction takes place. The context is understood to strongly

influence the interaction and is dynamic, familiar, supportive (physically and socially), and will naturally promote communication (Siegel-Causey & Bashinski, 1997). Materials being used in this space must be engaging and accessible to the learner, and as the communication partner facilitates the interactions, they are responsible to make any necessary adaptations to ensure the learner has optimal access and engagement to the materials or environment.

Utilizing the tri-focus framework provides a balanced approach to developing a communication intervention and also considers related factors inside and outside of the child. Key considerations include the role of the communication partner, the importance placed on the interaction occurring and the influence the immediate context has on the learner and their partner. The model requires not only an initial measure of the child's communication abilities, but also that the communication partner formatively assess the intervention to ensure the interaction is constantly meaningful and supportive to the learner's level of functioning. Having an understanding of how these factors relate to one another and affect the learner allow for a more comprehensive understanding to the nature of communication and provide a more authentic and beneficial communication intervention (Siegel-Causey & Bashinski, 1997). Both parties benefit from this type of interaction: the learner receives very accessible, intentional and responsive instruction while the communication partner gains a very comprehensive understanding of the child's communication abilities, preferences and the optimal conditions to facilitate a communicative interaction (Nelson, van Dijk, McDonnell, & Thompson, 2002).

The framework describes five specific strategies for communication development related to each of the three components that are relevant to individuals with multiple

disabilities who are operating at a pre-symbolic level of communication. These strategies include: enhancing partner sensitivity, increasing opportunities for communication, sequencing experiences, augmenting vocal input, and modifying the environment (Siegel-Causey & Bashinski, 1997). It is crucial that these strategies be tailored to suit the individual's level of communication understanding and behavioral state (p.114) in addition to being reciprocal in nature and allowing the individual to be empowered during the interactions.

Enhancing partner sensitivity requires the communication partner to have a comprehensive understanding of the learner's expressive communication. This includes using an "ABC analysis" where the partner observes the individual's communicative behaviors, taking note of antecedent and consequential outcomes, which then leads to the development of a gestural dictionary that details the individual symbolic and non-symbolic communicative behaviors (Siegel-Causey & Bashinski, 1997). The gestural dictionary documents the individual's communicative expressions so that they may be better understood by less familiar partners and includes the specific forms or ways the individual uses to communicate, as well as their associated meanings. Once the communication partner understands what the learner is attempting to communicate, they are more equipped to deliver a consistent and appropriate response. According to Siegel-Causey & Bashinski (1987) the ABC analysis and gestural dictionary are ways that communication partners can clearly identify and acknowledge the individual's communication signals and assign intentionality or meaning to the expressions.

Having opportunities for meaningful interactions with an understanding partner are essential to develop one's communication abilities (Siegel-Causey & Bashinski, 1997).

Generating situations that appeal to the individual and encourage them to communicate can be accomplished using activities and materials that are of great interest to the learner and lead to situations where the learner is required to make a choice. Having an awareness of the learner's needs and wants allows the communication partner wait until the learner makes a request for the activity or item, in stead of anticipating what they may want and providing it immediately. Allowing the individual a chance for self-expression during the interaction allows them greater control over the situation by giving them the opportunity to resume the activity, end it, or do something else.

Maintaining familiar experiences for the learner and sequencing them in a consistent and predictable manner allows for the establishment of predictable routines, allowing the learner an increased chance to participate in the activity and develop a sense of anticipation (Siegel-Causey & Bashinski, 1997). Using the daily activities of the classroom, routines can allow for consistent structured communication opportunities throughout the day as the learner beings to take on roles within certain reoccurring events. By sequencing the steps of an activity the learner can become more involved in the activity by taking on certain roles, as well as become more likely to communicate with their partner as they participate in the familiar steps of the task.

The fourth communication strategy for the partner is to augment vocal input to enhance meaning, facilitate retention and provide response pools for the learner (Siegel-Causey & Bashinski, 1997). Through this process, the partner's awareness of the learner's intended message can be enriched so that they may provide a more appropriate response that meets the individual's communication level to increase the meaning of the activity for the learner. The partner supplements their verbal expression with a concrete mode of

communication, such as a gesture, photograph or the actual item. Retention can be supported using a calendar box or daily schedule, such as an object schedule, to support the individual to recall, anticipate and communicate about familiar classroom activities (Siegel-Causey & Bashinski, 1997). Having the items of the schedule associated with tangible symbols allows the learner to eventually develop a pool of responses as the learner begins to understand that the items in the schedule represent specific activities. These responses can then be used to indicate preferences or for the learner to make choices about activities.

The last strategy is for the communication partner to control the environment so support natural and functional communication while the learner is alert and responsive (Siegel-Causey & Bashinski, 1997). The partner must determine if and how the sensory characteristics of the environment are affecting the individual ability to be responsive and learn. This includes and visual stimuli, such as lighting, auditory input, such as any background noise, as well as any additional tactile, olfactory or gustatory stimuli that may be present. Additionally, the learner's positioning and body orientation should be taken into consideration, as a determination made if any additional adaptive equipment is necessary to better promote participation in the activity taking place. All of these characteristics of the learning environment should be taking into consideration together to determine how they may affect the individuals behavior and the opportunities they have for communication during that specific time (Siegel-Causey & Bashinski, 1997). It is also important to consider that the sensory stimuli of the learning environment may affect the individual differently from activity to activity, or at different times of the day.

The Tri-focus framework provides an approach for communication development for learners with multiple disabilities that are primarily using non-symbolic means of communication (Siegel-Causey & Bashinski, 1997). The strategies within the framework are intended to be used simultaneously with one another to comprehensively increase the individual's communication skills during optimal times where they are alert and most responsive to the intervention. It is critical that the communication partner continue to be aware of how the learning atmosphere affects the learner so that they can then establish routine and structured opportunities for communication throughout the day. During these communicative interactions, the partner must strive to gain an increased understanding of the learner's communication signals and provide responses that include multiple forms of communication to support the individual in expanding their communication repertoire.

Four Aspects of Communication

Other models of communication development exist specifically for children with deafblindness, functioning at the pre-symbolic to early symbolic level. Seeing communication as a interactive social process, Bruce (2002) explains the Four Aspects of Communication as form, function, content and context. Within this view, form is understood to be the specific ways the child is providing or receiving the information, such as by using actions, signs, items, photographs, etc.; the content is the message being exchanges; and function is described as the reason for the communication/message and focuses on the attainment of early functions (seeking attention, refusal, requesting, identifying/naming, and commenting), which are greatly impacted by a child's dual sensory impairment (Bruce, 2002). These three aspects are all encompassed into the context or environment where the communicative interaction is taking place. The context

includes: the actual space, including arrangement of the space, visual and auditory stimuli; the child and their level of functioning, positioning, adaptive equipment, and amount of active participation; the activity taking place, which dictates potential messages as well as opportunities available for participation and communication; and also the communication partner, who identifies and responds to the child's potential communicative initiations while also providing chances for communication. Bruce (2002) explains the context to be the most dynamic aspect of the model, since any changes in the components of the context can affect the other aspects (form, function and content) as well as the communicative interaction taking place.

The four aspects model is similar to the Tri-focus framework with its importance on multiple related pieces affecting the communication interaction between a child and their communication partner; however, there are some differences worth mentioning. First, the Four Aspects model takes into consideration the specific function and content of the communication message being exchanged, not just the form being used. This is important because the content of the message is based on the child's individual preferences and the activity taking place; therefore the context strongly influences both the content of the message, its function and the form the child uses. Similar messages may have very different functions within different activities, while different forms may be used to express the same content depending on the situation. Thus, the form, function, content and context are dynamic aspects of a communicative interaction for a child with deafblindness, constantly interacting and influencing with one another. It is essential to consider each of the four aspects individually and together when developing a communication intervention for an individual with deafblindness.

Harmonious Interactions

Another similarity between the previously mentioned models is the importance of the relationship and interaction between the child with deafblindness and their communication partner. This relates to what Janssen, Riksen-Walraven and van Dijk (2003b, 2006) refer to as "harmonious interactions" between children with deafblindness and their teachers. These positive interactions between an individual with deafblindness and their parent, teacher or sibling are beneficial to the individual's overall development, but most especially in the areas of communication, social interactions and the reduction of problematic behaviors. The communicative behaviors of children with deafblindness are often difficult to identify and interpret by others, which then result in the expression of maladaptive behaviors, such as aggression towards self/others or retreating inward (Janssen, Riksen-Walraven, & van Dijk, 2004).

Janssen, Riksen-Walraven and van Dijk (2003b) developed an empirical framework to support harmonious interactions by enhancing the communication partner's ability to maintain an environment that allows them to identify and become "attune" to the communicative actions of the child. The Diagnostic Intervention Model contains an intervention protocol that starts with exploration and assessment of a suitable means to interact with the individual, an analysis of the communicative behaviors of both the child and communication partner occurring within the interaction, conducting the interaction and then evaluating its effectiveness (Janssen et al., 2003b). The initial two steps of the intervention are to engage those familiar with the child (parents, teachers, therapists, etc.) and determine the most preferred and effective ways of interacting. This includes obtaining information about the functional means of the communicative behaviors the child exhibits,

the specific forms of communication the child uses, as well as information regarding the physical and cognitive characteristics of the child (amount of vision and hearing, learning styles, adaptive behaviors). Additionally, the physical and social factors of the environment where the interaction will take placed are also assessed.

The following step of the Diagnostic Intervention Model is to analyze the specific features of the interaction by focusing on: (1) the communicative "signals" of both the child and the communication partner; (2) the specific ways each of the participants are interacting with one another; (3) the physical and social context; and (4) the initial intention of the interaction (Janssen et al., 2003b). The target interaction behaviors used to classify the communication signals are defined as: initiatives (initiation of the interaction), confirmation (indication that the initiation was recognized), answers (affirmative and negative responses), turns (reciprocal turn taking), attention (focus on the partner, activity and context), regulation of the intensity of the interaction (attunement); affective involvement (emotional sharing), and independent acting. These interaction behaviors were initially developed as a part of an earlier intervention study on harmonious interactions that analyzed the interactions of children with deafblindness and their communication partners (Janssen, Riksen-Walraven, & van Dijk, 2003a). The remaining steps of the Diagnostic Intervention Model are the implementation of the intervention and evaluation of its effectiveness.

Research on harmonious interactions has shown that when teachers are responsive to and supportive of the communicative behaviors that are unique to individuals with deafblindness and often missed, decreases in their demonstrations of inappropriate behaviors were observed (Janssen et al., 2002). Utilizing the Diagnostic Intervention

Model as a tool to support harmonious interactions between children with deafblindness and their communication partners has demonstrated to be an effective means of not only establishing positive and respectful interactions, but also in enhancing the communication capacities and capabilities of children with deafblindness (Janssen et al., 2004, 2006). The value of this work extends beyond its importance in supporting communication development, as it represents a significant portion of the intervention research available in the overall field of deafblindness.

For a child with deafblindness, conversations can take place before formal language has been acquired, using movement and touch (Miles & Riggio, 1999). Through equal participation as they interact over a shared subject of interest the child and their communication partner engage in "coactive movement" - a dynamic interaction between the child and their communication partner that incorporates physical contact and shared body movements (van Dijk, 2002). As they engage in this shared movement-based interaction, the communication partner has the opportunity to experience the child's communication efforts through a positive mutually beneficial interaction. The development of a relationship between the teacher and the child

Alertness and Engagement

When determining the optimal time to engage a student with intensive support needs in a learning interaction or conversation, a teacher may consider many internal and external factors. It is essential that the individual child is physically prepared to communicate. Behavior state refer to the internal physiological dynamics, such as the maturity and organization of the central nervous system, that facilitate the responses or behaviors the individual has towards the environment and to overall stimulus (Munde,

Vlaskamp, Ruijssenaars, & Nakken, 2009). They reflect the internal processes that are leading to the expression of the particular behavior, ranging from deep sleep to awake and alert. Not only is it possible to quickly change from one state to another, but also cyclical patterns allows one to predict the next state to follow. Eight classifications of behavior states have been used in research on children with severe and multiple disabilities, which are categorized as: Sleep States (asleep-inactive; asleep-active), Interdeterminate States (drowsy; daze), Preferred Awake States (awake inactive-alert; awake active-alert), and Other Awake States (awake-active/stereotype; crying/agitated) (Guess et al., 1993; Guess & Siegel-Causey, 1995). Environmental factors also influence the transition into and the amount of time one remains within a certain behavior state; for example, the "awake active-alert" state, the optimal state for learning, can be associated with participation in an activity with adult interaction, while "deep sleep" was associated with the individual in a prone position without any interaction (Guess et al., 1993).

Looking at how an individual is participating or interacting within a given context, engagement can be understood as the specific behaviors an individual is exhibiting in response to stimuli within the environment (Cuvo, May, & Post, 2001). The interacting behaviors are highly contextualized, operationally defined for the individual within the particular setting and activity. One way to operationalize an individual's level of engagement can be by measuring when the individual attends by turning towards, touching, or looking at the stimuli presented (Kennedy & Haring, 1993), or operating an item per its intended use (Realon, Bligen, La Force, Helsel, & Goldman, 2002). Additionally, an individual's level of engagement can be supported and increased through learning

environments that support multiple opportunities for choice making (Kennedy & Haring, 1993).

Alertness is an essential prerequisite for learning and can be understood as a observable behaviors of interaction and engagement (Munde et al., 2009). One can measure alertness as the degree to which one is "open" to the environment (Munde, Vlaskamp, Ruijssenaars, & Nakken, 2011). This measure is unique to the individual, taking into consideration the factors of their disability, physical abilities and overall level of functioning. Changes in the environment affect one's level of alertness, such as the type of stimuli and its presentation, specifically when intended to increase alertness (Munde et al., 2009). For example, interaction and movement typically demonstrate positive influences on an individual's alertness measure.

"In essence, a person's behavior state is a measure of his or her functional level of engagement at any given point in time" (Foreman, Arthur-Kelly, & Pascoe, 2004, p.184). State behavior greatly impacts the learning and development of individuals with multiple disabilities by serving as a measurement to the individual's level of alertness and engagement (Guess et al., 1993; Guess & Siegel-Causey, 1995). Optimal learning opportunities can be identified when educators consider the individual's internal, physiological conditions (behavior state), interaction with the environment (alertness) and responsiveness to stimuli (engagement).

Augmentative and Alternate Communication (AAC)

Augmentative and alternative communication, or AAC, can be defined as "a set of procedures and processes by which an individual's communication skills (i.e., production as well as comprehension) can be maximized for functional and effective communication.

It involves supplementing or replacing natural speech and/or writing with aided (e.g., picture communication symbols, line drawings, Blissymbols, and tangible objects) and/or unaided symbols (e.g., manual signs, gestures, and finger spelling)." (American Speech-Language-Hearing Association, 2002, Definitions section, para. 2). Aided symbols require an external medium that serves as the vehicle for communication; however, unaided symbols are non-symbolic and produced from the individual's body. Thus, unaided symbols can serve as an ideal medium for individuals with severe disabilities that have yet to develop symbolic language. For example, while saying the word "ball" an aided AAC symbol would be a picture of a ball, while an un-aided symbol could be the manual sign for "ball".

When communication through speech is not possible, AAC can serve as alternate means of developing receptive and expressive communication skills for individuals with a range of etiologies, including intellectual disabilities and deafblindness (Romski & Sevcik, 1997). Because there are no prerequisite criteria for AAC, and it uses a broad range of symbolic vehicles ranging from the most simplistic gestures to highly sophisticated characters, it can serve as a highly effective medium for representation for individuals with deafblindness. AAC allows for a variety of mediums to be incorporated into the child's communicative repertoire based on their individual capabilities. According to Romski and Sevcik (2005), "in this sense, then, AAC is truly multimodal, permitting a child to use every mode possible to communicate messages and ideas" (p.177). The system and process can be completely individualized for the individual user and optimized for a particular situation.

In their review of the research literature related to AAC instruction, Snell, Chen and Hoover (2006) identified common characteristics that supported and encouraged student motivation, attention and ultimately learning. These included: environmental arrangement, partner proximity and child-guided instruction. When arranging the environment, a key consideration is having the AAC materials consistently present at all times, and utilized across areas or environments. Partner proximity is important because it allows for the child's communication attempts to be labeled and reinforced during optimal times when the learner is attending to the activity and motivated to participate. The entire experience should be child guided, with natural reinforcers and using preferred objects for instruction. Additionally, using a range of stimuli during interactions taking place naturally within the environment are ways to support the generalization of the learned communication skills across contexts (Snell et al., 2006).

The use of technology of can be a highly effective for aided AAC instruction (Wilkinson & Hennig, 2007). With technology every so quickly evolving, devices have become more affordable to the general consumer, and include features such as digital cameras that allow photographs or videos to be captured instantly and included in a child's communication system. However, aided AAC does have some limitations, especially when compared to unaided AAC. For individuals with the fine motor coordination and strength to produce manual gestures and signs, unaided AAC allows for potentially endless communication using a great amount of vocabulary across environments, where as with aided AAC the individual is limited to the vocabulary available on their communication board or device (Wilkinson & Hennig, 2007).

Literacy

Literacy is most widely understood as the transmission of information through reading and writing. When applying the concept of literacy to individuals with deafblindness, this definition must be extended beyond reading and writing text to the social process of exchanging various representations for communication (Ferrell, Bruce & Luckner, 2014). There is very limited research on literacy supports for students with deafblindness and many discrepancies exist with teachers' understanding of literacy for this population and the accommodations, teaching strategies and assessments related to literacy that are currently being implemented in classrooms serving children with deafblindness (McKenzie, 2009).

The potential benefit of literacy instruction for individuals with congenital deafblindness has yet to be determined as research continues to emerge in this area (McKenzie, 2009). However, excluding students from literacy instruction because of disability status is neither ethical, nor permitted under federal laws pertaining to education. Under the Individuals with Disabilities Education Improvement Act (IDEA, 2004) all students with disabilities must have access to the general education curriculum in the areas of English language arts, math and science. Additionally, the No Child Left Behind Act (NCLB, 2001) requires that all students be assessed in these areas at specific grade levels, and demonstrate progress from year to year. Since the research is limited on teaching literacy to students with deafblindness, it can be difficult for special educators to create meaningful learning contexts to provide these unique learners with the literacy skills necessary to achieve outcomes and enhance their quality of life (McKenzie, 2009; Luckner, Bruce and Ferrell, 2015).

When individuals with congenital deafblindness are seen as "potentially literate", the instructional context is reshaped to be one of possibilities, allowing for greater understanding of the individual's potential for learning and success (Cooper-Duffy et al., 2010). Literacy a critical lifelong skill for individuals with complex disabilities (Kliewer & Landis, 1999). Some of the ways literacy skills can be developed for this population is by providing opportunities for participation in literacy experiences that engage the individual in meaningful lessons with appropriate adaptations that encourage communication, while reinforcing and increasing their participation in such interactions.

Literacy for individuals with severe disabilities can serve as a means to support language development by teaching vital communication skills that will allow access to information within and beyond the immediate environment that can be used across many different areas of life (Downing, 2005b). Even though all individuals with severe disabilities will not become advanced readers, instruction should be provided to support these individuals to reach their full potential. However, conventional means of literacy instruction used in general education may not be appropriate for individuals with severe disabilities because of the multiple factors affecting their functioning and development (Fenlon, McNabb, & Pidlypchak, 2010). Individuals with severe disabilities have different life experiences from their non-disabled peers, because the effects of their disability result in decreased cognition, physical limitations, vision and/or hearing losses, and complex medical concerns, which often result in the individual requiring increased medical attention, partial or total assistance with self-care and greater therapeutic needs (Basil & Reyes, 2003).

Because of the high level of care children with congenital deafblindness often require, their families may not engage as often in typical literacy activities with their child at home, such as shared reading, and consider literacy a lower priority than they would for a non-disabled child (Bruce, 2011). Even though these individuals are provided with fewer literacy experiences related to text at home and in school than their typically developing peers, when provided with appropriate instruction these individuals have demonstrated the ability to acquire literacy skills, using different methods and in a variety of contexts (Koppenhaver et al., 2007). Moreover, using intentional systematic instruction, they have also been able to acquire skills beyond the level of functional literacy. Even against the odds, of low-expectations and limited access to rigorous instruction, these individuals have demonstrated the ability to make gains in literacy and become literate citizens (Ming & Dukes, 2009). Additionally, students with congenital deafblindness can benefit from literacy instruction by having increased access to literature, which enhances the student's capacity to "read" or interpret symbols by teaching skills with direct and long-term benefits to the individual (Kliewer, 2008; Kliewer et al., 2004).

Read-Alouds

An interactive read-aloud (also called shared story reading and story-based lesson) is a systematic classroom activity that engages students in the reading process and encourages them to interact over the meaning of the story (Hudson & Test, 2011). After selecting a developmentally appropriate text of interest to their students, the teacher reads the text in a way that engages the students to collaboratively develop an understanding of the information before, during and after reading the book (Fisher, Flood, Lapp, & Frey, 2004; Wiseman, 2011). With an interactive read-aloud, the process of learning how to read

extends beyond the acquisition of isolated literacy skills towards enhancing an individual's language development through dialogue, engagement, and collaboration. Discussions surrounding a text can build a sense of community within a classroom as the students begin to make significant connections with the text as they collaboratively construct meaning and develop critical thinking skills (Wiseman, 2011). Examining many interactive read-aloud lessons, Fisher, Flood, Lapp and Frey (2004) identify seven essential components to the activity: text selection; preview and practice; establishing clear purpose; modeling fluent reading; animation and expression; discussing the text; and, independent reading and writing.

Before the lesson begins, a text is intentionally selected that is rigorous, while also matching the interests of the students (Fisher et al., 2004). The text must be at a level that the students can understand, while also introducing new vocabulary and concepts. Using high-quality literature that aligns with the students' interests can further support engagement with the material, allow real world connections to be made to their lives, and also stimulate meaningful questions during reading and thoughtful discussion following. After choosing a text, the teacher previews and practices reading to effectively include pauses, model fluency, insert opportunities for questions and identify key and potentially challenging vocabulary (Fisher et al, 2004). Pausing while reading creates occasions for the teacher to monitor comprehension and for the students to ask clarifying questions, make predictions and record key vocabulary. Previewing and practicing the text before the lesson also offers the teacher the chance to make notes about the book, related to the plot, or mark areas of potential difficulty for some of the students.

During the interactive read-aloud, the teacher first establishes a clear purpose for the activity and the selection of the text, before modeling fluent reading with animation and expression (Fisher et al, 2004). Starting the lesson with an intention allows the students to keep in mind the literacy skill they should concentrate on, such as predicting or character analysis, while also making it clear that they will be active participants in the activity, rather that passive recipients of the information. This also provides an opportunity for the teacher and students to "explore" the book before reading, allowing for a guided discussion about the components of the story, predictions to be made about the plot, and an exploration of the visual features of the cover (Wiseman, 2011). Having practiced the text, the teacher is able to fluently read with few errors, understand the sequence of events and model language and oral reading (Fisher et al, 2004). Animating the text with different voices, gestures, movements, objects and other props not only captivates the students, but also keeps them attentive, interested and engaged in the activity.

Before, during and after reading, the teacher deliberately engages the students in discussion to measure their understanding of the material and to allow the students to make personal connections with the characters or events of the text (Fisher et al, 2004). This can be accomplished by encouraging the students to use multiple means of expression in response to the teacher's questions, such as through body movements/gestures, singing, visuals, objects, etc. Here the teacher supports the students by scaffolding the discussion to help them to identify and apply their ideas about the story to their personal lives and classroom experiences as they construct knowledge and develop critical thinking skills (Wiseman, 2011). The development of meaning and construction of knowledge occurs through the interaction and dialogue happening throughout the lesson.

The final component of an interactive read-aloud consists of the reading and writing activities, that extend the reading of a book from a stand-alone activity, but rather apart of an overall literacy program (Fisher et al, 2004). Here the students have another chance to demonstrate the skills that were intentionally established before reading the text and practiced throughout its reading as they also build upon the ideas they articulated as the book was being read (Wiseman, 2011). Students are guided in developing a deeper meaning of the concepts presented in the text related to a specific theme or idea. This can be accomplished through journal writing using writing prompts, or having the students further research and explore events of text in other books or on the internet. Many different activities can take place following the interactive read-aloud that will help the students to further understand the concepts presented in the text, demonstrate the literacy skills targeted and make connections to their own experiences.

Interactive read-alouds allow students to engage with and respond to literature to gain understanding and develop critical language skills through a supported interaction (Wiseman, 2011). Together students are guided to develop a deeper meaning of their ideas that emerged in response to the material in a collaborative manner that also establishes a classroom community of learning and promotes critical thinking. Having an understanding of the systematic components of an interactive read-aloud can allow teachers to provide a high-quality lesson that supports learning and is a critical component of an instructional literacy program (Fisher et al., 2004; Hudson & Test, 2011).

There is an increasing level of research that supports interactive read-alouds as effective practice for literacy development with students with extensive support needs (Browder, Lee, & Mims, 2011; Hudson & Test, 2011; Mims, Hudson, & Browder, 2012).

Read alouds can be a motivating literacy activity for a child with complex disabilities that is engaging and which support their communication development (Kaderavek & Rabidoux, 2004). According to Park (2001), interactive storytelling is intended to make storytelling accessible to everyone. It is designed to meet the unique and individualized needs of all the participants in order to include every student in the storytelling process. Simple predictive texts, ancient philosophy and even Shakespeare are told by generating emotional responses using sound, vision and touch to emphasize the events. Even though the actual words of the story may not be understood by every student (due to their sensory impairments or cognitive functioning), musical instruments, gross motor movements, clapping, auditory and vibratory elements are incorporated to convey the feelings and meaning of the story.

Browder, Mims, Spooner, Ahlgrim-Delzell and Lee (2008) describe how a commercial text can be adapted to increase engagement in a shared story or read aloud activity for three individual children with multiple disabilities. Physical alteration of the book itself, modifications to the content and the incorporation of additional materials were used to promote access and engagement to the material and to accommodate for each student's individual cognitive and sensory needs (Browder, Mims, Spooner, Ahlgrim-Delzell & Lee, 2008). The physical modifications to the book included removing pages to reduce the length of the story and laminating the pages. The content was adapted to support comprehension by removing/altering lines of text, supplementing the text with object and/or picture symbols, and changing the main character's name to that of the target student to increase attention to the story. Also, as the text was read to the students, actual objects mentioned in the text were incorporated into the read aloud to support meaning

making related to the elements and actions of the story (Browder, Mims, Spooner, Ahlgrim-Delzell & Lee, 2008).

For individuals with deafblindness, some key literacy lessons include story boxes, calendar systems, and experience books (Luckner, Bruce and Ferrell, 2015). By supplementing a story read aloud with a box of items from the story, students can easily become actively engaged in the text individually or as a group (Drissel, 1997). This interactive literacy activity allows students the opportunity to become involved with the events of the text to build comprehension skills as well as enhance vocabulary and concept development. As the story is being read, corresponding items are removed from the box to reinforce actions or events from the text. The items allow tactile representations of the characters and/or events and can also serve as conversation starters or to assess comprehension.

A calendar system, or anticipation shelf, is another effective way to build literacy and create opportunities for communication with congenital deafblindness (Blaha & Moss, 1997; Miles & Riggio, 1999; van Dijk et al., 2001). The system consists of labeling school activities with tangible symbols that are relevant and meaningfully represent the particular event for the child. Depending on the student's level of symbol use, one might use a picture symbol, photograph, miniature item, or a portion of an actual item related to the activity as a symbol to represent the task/event. For example, a fork, similar to one the student uses to eat, may be used to label lunchtime; portion of a diaper may be used to indicate bathroom time; or a photograph of the schoolyard jungle gym could represent recess.

Lastly, experience books are created by the student and their teacher and integrate objects, photos or other representations that related to a unique and pleasurable event (Bruce, Randall & Birge, 2008). The book contains description of significant aspects of the experience, with the actual objects from the event included on the relevant pages. This allows the child to be an active participant in not only the development of the experience book, but also be highly engaged in the retelling of a highly pleasurable experience (Bruce, Randall & Birge, 2008).

Literacy Instruction

Participating in literacy activities not only allows an individual with congenital deafblindness access to information outside of their immediate context, but also provides an opportunity for self-expression and active engagement with others (Blaha & Moss, 1997; Miles & Riggio, 1999; van Dijk et al., 2001). For individuals with congenital deafblindness to have meaningful participation in literacy activities current notions of literacy must be expanded beyond concepts of print towards the process of meaning making meaning through pre-symbolic and symbolic interactions that build vocabulary and foster communication development (Miles & Riggio, 1999). Additionally, literacy activities for individuals with deafblindness must move beyond simple access towards active engagement and participation in activities that allow meaningful connections to be made to their life experiences. This requires the child's past experiences, or experiential history, and means of communication to be taken into consideration when planning literacy instruction. Meaningful literacy instruction occurs: during an interactive activity that is motivating to the learner; within an environment that is familiar and communicatively supportive; using shared forms of communication; and, with a communication partner that

has an established trusting relationship with the learner. In order for information to be exchanged in a meaningful manner that relates to the learner's life experiences, the literacy activity must promote active engagement and participation, which supports communication development as information is sent to and received from the communication partner using a shared communication form.

The adult's primary role is to coordinate all of the moving parts occurring during the literacy interaction. This includes having an understanding of the individual and also manipulating the learning environment to support and sustain the interaction (Miles, 2005). Initially, they must gain an understanding of the learner's personal characteristics, such as the amount of functional vision and hearing; degree of symbolic understanding; modes and forms of communication; level of cognition; and, the individual's preferences and interests. Understanding and accommodating for each of these facets will ensure the activity is not only physically and cognitively accessible to learner, but also that it is engaging and motivating.

It is important that the adult remain responsive to the child throughout the interaction. Communication development best occurs when the child with deafblindness has an established and trusting relationship with their communication partner, and both interact together over a shared activity or topic (Bruce et al., 2004). Throughout the interaction, the adult is responsible to regulate the child's emotional state and arousal level to maintain a sense of emotional security. This not only supports communication and social emotional development for an individual with congenital deafblindness, but they also allow the adult to reciprocally interact with the learner, modeling new communication forms and utilizing a variety of familiar and novel representations.

The literacy activity should also be based on the learner's individual characteristics, utilizing multiple sensory channels to send and receive information and that incorporates the individual's preferences/interests. In order to allow for many opportunities for practice, incorporating the activity into the structure of the school day using the daily schedule can be one effective way to implement a literacy activity that is familiar, predictable and consistently being taught. As the child becomes more familiar with the activity and begins to understand the expectations of the lesson it can be expanded into a more substantial and richer literacy lesson by decreasing adult support or adding additional components to the activity.

Additionally, an important consideration in literacy instruction for children with congenital deafblindness is to provide opportunities for the individual to actively engage with meaningful and familiar representations. The communication partner is responsible for the selection of these representations, and must consider the learner's level of symbolic understanding when selecting a more concrete or more abstract representation for the activity. To promote optimal engagement, the representation should have a direct and functional association to the activity. The communication partner must also continuously create and modify the situation to support the learner's active engagement and participation with the representation in a reciprocal style of communicative interaction (Janssen et al., 2003b).

Throughout the literacy interaction, active participation can be elicited in a variety of ways. At the beginning of the activity, the communication partner can have the learner make a choice about which object they will use for the interaction. This can easily be facilitated by simply providing the child with two preferred objects and having them select

one for the activity. After a choice has been made, both the learner and the adult can take turns exploring, manipulating and activating the toy, with the adult following the child's lead. Incorporating music and movement also supports active engagement by singing along, engaging in movements related to the song, and with the adult imitating the child's responses (Bruce et al., 2004). Additionally, incorporating AAC devices can also support the interaction by allowing the child to have a "voice" in the activity to request a turn, provide a response, comment or give a direction. The key to supporting the child's active engagement is for the adult to remain focused on the child throughout the activity, making changes to the situation as necessary to continue the interactive dynamic and maintain the child's interest.

Teaching using the principles of systematic instruction is a method that has been used with individuals with severe disabilities for quite some time. Systematic instruction includes: "clearly identifying learning targets as behavioral objectives; breaking those objectives into their components through a talk analysis; using prompts, reinforcement, and error correction to facilitate learning; and collecting and recording performance data to monitor learning progress" (Westling, Fox & Carter, 2015, p.33). Systematic instruction is grounded in assessment, as it allows teachers to inform their instructional practice and to make instructional changes in response to student performance to better support learning (Best, Heller, & Bigge, 2005). Systematic instruction also includes prompting sequences that support student success in learning, often leading to "errorless learning" with the prompts being gradually faded for the student to independently demonstrate the skill (Westling, Fox, & Carter, 2015). Using errorless learning to minimize incorrect responses and decrease the potential for student errors can support the maintenance of a reinforcing

learning environment (Snell & Brown, 2011). Moreover, providing student the correct amount of time to process and formulate and execute a response to a prompt is also necessary and known as "wait time" (Best, Heller, & Bigge, 2005). Additionally, reinforcement, especially positive reinforcement, is also an effective way to encourage an increase in the demonstration of preferred and expected behaviors, and thus promote skill acquisition (Snell & Brown, 2011). Finally, assessmnet is also an important aspect of systematic instruction, as it allows teachers to inform their instructional practice and make changes to support student learning (Best, Heller, & Bigge, 2005).

Teacher Beliefs

The beliefs that teachers hold can impact different aspects of teaching and learning. Their thoughts and attitudes influence instructional decisions made in the classroom, as well as the learning experiences and academic outcomes of their students (Soto & Goetz, 1998). Additionally, there is a strong relationship between a teacher's expectations for student achievement, teacher efficacy and the teacher's goal orientation (Rubie-Davies, Flint, & McDonald, 2012). Gersten, Walker and Darch (1988) found that in special education, when teachers viewed themselves as highly effective, they tended to hold higher expectations for student behavior and achievement, used instructional time more efficiently and were more willing to seek technical assistance to support student outcomes. Believing that they were successful in teaching students with disabilities, these teachers were more optimistic about the learning potential of their students, while also feeling more confident in their instructional decision-making.

Teacher efficacy describes the capacity a teacher has to employ effective strategies to teach a particular content (Gersten, Walker & Darch, 1988). It consists of the decisions

the teacher makes to increase student achievement, including the instructional judgments they make and the pedagogy they adopt, as well a belief that they have the skills necessary to promote student learning (Rubie-Davies, Flint, & McDonald, 2012). This connects to the structure they create within the learning environment that supports the students to attain their learning objectives. Therefore, "teacher expectations relate to *where* the teacher believes the students in his/her class will get to, teacher efficacy relates to *what* s/he believes s/he can do to get the students there, and teacher goal orientation relates to *how* s/he believes lessons and assessments should be structured in order for students to reach their goals" (Rubie-Davies, Flint, & McDonald, 2012, p. 272).

When asked about the factors that lead to student achievement, teachers reported that a structured teaching intervention allowed them to overcome perceived barriers to achievement, such as the implications of a child's disability, allowing the students to meet, and even sometimes exceed, the instructional goals set (Rubie-Davies, Flint, & McDonald, 2012). "Teachers who believe that they can make a difference in students' performance appear to accept responsibility for their students' successes as well as their failures" (Soto & Goetz, 1998, p. 137). The beliefs that teachers hold about how effective they are strongly influences the success they have in getting their students to learn (Bruce, Trief, & Cascella, 2011). The judgments they make regarding the intervention they will implement also can help to compensate for, or even overcome, the perceived barriers to student success they have initially identified (Soto & Goetz, 1998).

Ruppar, Dymond and Gaffney (2011) examined the factors that influenced teachers' perceptions and decisions about literacy instruction for children with severe disabilities who used AAC. Consistently, teachers saw a benefit to literacy instruction for students

with severe disabilities, most especially when it took place within natural skill-based contexts (article mentions “life-skills”) and embedded into familiar routines. The short-term and long-term benefits to the individual were key considerations when teachers determined the specific literacy skills to teach, in addition to the instructional setting, and the cognitive, communicative and overall functioning skill levels of the individual. Teachers preferred to engage in literacy instruction outside of the general education classroom and within a more specialized setting, citing the increased structure and predictability of a special education classroom for children with severe disabilities allowing for a more meaningful life-skills-based intervention for the individual, such as one including the daily schedule or though a structured communication interaction (Ruppar, Dymond & Gaffney, 2011).

Overall, teacher expectations of student achievement related to literacy skill acquisition for their students with severe disabilities were primarily based on the cognitive and communication characteristics of the individual (Ruppar, Dymond & Gaffney, 2011). Teacher efficacy was apparent through the consideration of how meaningful the selected skills were to an individual’s overall functioning, including careful selection of an appropriate instructional context, while goal orientation led from skill development to be embedded within familiar and highly structured routines. The overarching belief that the teachers held that all students had the potential to benefit from meaningful literacy instruction directly influenced the decisions they made related to teaching and learning (Ruppar, Dymond & Gaffney, 2011).

When considering literacy instruction for children with deafblindness, teachers see communication as an integral aspect, noting that both literacy and communication

development are best situated within real-world experiences (McKenzie & Davidson, 2007). These skills should be integrated into all activities, and by accessing literacy rich environments where books and other materials are accessible to the individual connections to real life experiences can be made that set the foundation for future concept development. Furthermore, children with deafblindness not only have the potential to acquire literacy skills, they also can benefit from receiving instruction using research-based literacy strategies similar to those used in general education settings (McKenzie & Davidson, 2007).

Exploring teacher beliefs about literacy for children with deafblindness, McKenzie (2009) found that teachers often took an active role in literacy instruction. Not only did teachers share a broad understanding of literacy as communication, they also saw it to be interactive and the basis of all learning. "Teachers viewed themselves as the persons responsible for facilitating literacy development. The teachers expressed their role as facilitator through organizing the environment and providing opportunities to expose students to and engage students in literacy" (McKenzie, 2009, p. 298). This included establishing classroom areas with accessible labels in multiple forms, implementing research-based literacy strategies, such as read alouds, and using appropriate assessments, such as the Learning Media Assessment, to guide instructional decisions related to literacy. Optimal literacy learning environments are responsive to a student's literacy behaviors and include tailored materials appropriate for the individual needs of each child (Parker & Pogrund, 2009). Teachers valued literacy and its relationship to communication and cognitive development, understanding that they, as facilitators, were responsible for

supporting their students with deafblindness to access and participate in meaningful literacy experiences (McKenzie, 2009).

Conclusion

Literacy is a critical lifelong skill for individuals with congenital deafblindness and can be used to support communication development (Ruppar et al., 2011). Using a supportive framework that expands beyond the learner to the instructional context, content being learned and communication partner can provide a meaningful and interactive learning experience (D. Browder et al., 2009; Downing, 2005a, 2005b). Typical notions of literacy need to be expanded to meet the needs of learners with congenital deafblindness as they engage in interactive literacy experiences that support communicative and conceptual development (Bruce, 2002; Siegel-Causey & Bashinski, 1997).

CHAPTER THREE

METHODS

> I want to understand the world from your point of view. I want to know what you know in the way you know it. I want to understand the meaning of your experience, to walk in your shoes, to feel things as you feel them, to explain things as you explain them. Will you become my teacher and help me understand?
>
> –James P. Spradley
>
> (1979)

Utilizing qualitative research methodology, this dissertation aimed to identify how teachers use classroom read alouds to support communication and literacy development for learners with congenital deafblindness. Qualitative research was appropriate for this type of investigation because it took place within natural environments and looked to explore and attach meaning to real-world phenomena (Denzin & Lincoln, 2005). By collecting data from multiple sources, qualitative research can yield descriptive information that allows for greater understanding of how the attitudes and beliefs of individuals influence their actions within a particular context. For this project, descriptive information was collected and analyzed to provide a greater understanding of how teachers were conducting classroom-based read aloud lessons and the strategies they were using during instruction. To gain insight as to why these teachers used specific strategies during their lessons, the beliefs that

teachers' held regarding communication and literacy development for their students with congenital deafblindness was also investigated.

Research Design

Qualitative research produces scientific evidence using "a systematic approach to understanding qualities, or the essential nature, of a phenomenon within a particular context" (Brantlinger, Jimenez, Klinger, Pugach, & Richardson, 2005, p. 195). Incorporating a variety of data sources and methods to triangulate the information collected "reflects an attempt to secure an in-depth understanding of the phenomena in question"(Denzin & Lincoln, 2005, p. 5). The particular context for this research was special education classrooms where teachers were engaging children with congenital deafblindness in literacy activities. Analysis of the descriptive information collected in each setting related to the environment, teacher perceptions of literacy and the instruction occurring led to insights regarding how teachers were engaging this population of students in classroom read alouds and which particular literacy and communication strategies were being applied. Brantlinger et al (2005) state that "qualitative research is not done for purposes of generalization but rather to produce evidence based on the specific exploration of specific contexts and particular individuals" (p.203). Therefore, the intention of this study was not to make broad statements about literacy instruction for children with congenital deafblindness, but rather to add to the evidence about strategies teachers use during classroom-based read alouds and how the communication and literacy beliefs of the individual teachers related to the instructional strategies they employed.

Case study research has become prevalent in social science research due to its long-standing history across related fields of law, medicine and psychology (Creswell, 2013).

As described by Yin (2003), a case study is an "all-encompassing method" of research, which includes specific measures for design, data collection and data analysis. It is considered "an in-depth exploration of a bounded system (e.g., activity, event, process, or individuals) based on extensive data collection" (Creswell, 2015, p. 469). A case study is not only a methodology, but also a product of the research that is produced examining one or multiple cases within the "bounded system" through detailed and rigorous data collection from multiple sources to identify descriptions and common themes relevant to the cases examined (Creswell, 2013). The case being studied may be an individual, group or process where multiple forms of data are gathered in an effort to gain an in-depth understanding or insight of the phenomena of interest.

In order to gain a better understanding of how teachers' beliefs about communication and literacy development impacted their practice, a collective case study was an appropriate methodology for this investigation, because "a number of cases may be studied jointly in order to investigate a phenomena, population, or general condition" (Stake, 2005, p. 445). Because clear boundaries can be identified between and across the cases, each case was studied individually and then collectively to gain further understanding into the issues being studied (Creswell, 2015). Extensive data was collected on each individual case across multiple data sources (observations, interviews and field notes) and the analysis led to the emergence of themes that helped to further understand the cases and the phenomena of interest under investigation (Creswell, 2013).

Research Questions

The specific research questions for the research project were as follows:

(1) How do teachers use classroom-based read alouds to support communication and literacy development for their students with congenital deafblindness?
    i. How is the learning environment being utilized during the lesson?
(2) Do teachers' beliefs about communication and literacy development for children with congenital deafblindness influence the instructional approaches and strategies they use during a classroom-based read aloud?

Participants

Participants for the research project were selected using purposive sampling methods, where the researcher used his judgment to select a sample that reflected the population of interest and also met the criteria for the research (Gay, Mills, & Airasian, 2012). Purposive sampling allows the researcher to use their knowledge and understanding of the population, in this case, teachers and the students with deafblindness that they work with, to choose a representative sample of the larger population. Criterion sampling is the specific approach that was used where participants had to meet a "predetermined criteria of importance" (Patton, 1990, p. 176).

The researcher contacted a special education director of a large high school district in southern California and asked if they had any students in special education with deafblindness. The special education director confirmed five students with deafblindness and consented to allow the research to take place within the district. The researcher was then provided with teacher names and proceeded to contact each teacher asking if they

would like to participate in the investigation and to seek more information about their student with deafblindness.

Teacher Participants

Three of the four teachers met the following criteria to participate in this investigation:

working as a credentialed special education teacher per the state of California in the area of moderate/severe disabilities for at least two years; working with at least one child meeting the student criteria (see below); having experienced some training in deafblindness whether through in-service training or their credential program; and, currently utilizing read alouds or shared reading as a part of the pre-existing literacy curriculum.

Teacher S.

Teacher S worked as the only substantially separate classroom for students with multiple or severe disabilities in a public high school. In her classroom there were three general classroom aides, a 1:1 aide and nine students with multiple or severe disabilities. Additionally, each period between four and six students without disabilities came into the classroom each day to work as peer tutors for course credit or volunteer hours. Teacher S had been teaching for five years at that school and received her credential in moderate/severe disabilities from the University of San Diego. She has been a credentialed moderate/severe teacher for five years.

Teacher L.

Teacher L was the department head for the moderate/severe program at her high school. She also taught a substantially separate severe disabilities classroom that was one of four classes in the department at that school. Her classroom consisted of three to four

teaching aides that rotate throughout the department and 10 students with multiple or severe disabilities. Teacher L also had 8-10 peer tutors coming into her classroom from general education each period to further support the students in the class. Teacher L has been a classroom teacher for twelve years and received her teaching credential from the moderate/severe program at San Diego State University.

Teacher R.

Teacher R was also the department head for the moderate/severe program at his high school. In his substantially separate classroom there were three aides and twelve students with multiple or severe disabilities. Peer tutors also rotated into his classroom, with four to twelve being present throughout the day. Teacher R had been teaching for eighteen years as a moderate/severe teacher within that district and received his teaching credential in special education from a local university.

Student Participants

The federal criteria for deafblindness, as outlined by the Individuals with Disabilities Act (2004), states:

> "Deaf-blindness means concomitant hearing and visual impairments, the combination of which causes such severe communication and other developmental and educational needs that they cannot be accommodated in special education programs solely for children with deafness or children with blindness." 34 CFR 300.8 (c) (2)

For this research study students had to meet the following inclusion criteria to be eligible for participation: congenitally deafblind; meet the criteria for deafblindness under the federal definition; demonstrate intentional behavior and communicate between levels III-

VI as described within the Communication Matrix (Rowland, 1996); and, be between 4-18 years old. Exclusionary criteria included: individuals that primarily communicate using abstract symbols and students with high absenteeism.

Student E.

Student E was a seventeen year-old female with severe disabilities and deafblindness in Teacher S's class. She experienced a right-side hearing loss and a visual impairment, necessitating the use of a hearing aid and glasses. During instruction Student E also utilized an FM system to support her hearing. Student E communicated using single-word word approximations, gestures and manual signs. She also used an iPad as an AAC communication device and made choices from an array of four pictures. When asked questions, Student E responded with a single-word approximation, a manual sign or by gesturing to indicate her answer.

Student N.

Student N was a fifteen year old female with severe disabilities and deafblindness also in Teacher S's classroom. She experienced bi-lateral hearing losses and very little visual acuity, and wore hearing aides in both ears. Student N also was supported by an FM system during instruction and also used a wheelchair to support her mobility for long distances. She communicated using a system consisting of object representations mounted on plastic cards with braille labels. She also responded to hand-under-hand manual signs, and could produce some manual sign approximations.

Student D.

Student D was assigned to Teacher L's classroom. He was a sixteen year old male with severe disabilities and deafblindness. Student D experienced bi-lateral hearing losses

and a visual impairment that required the use of hearing aides and glasses. He was able to ambulate with assistance, but mostly used a wheelchair for mobility. Student D communicated by primarily using vocalizations and simple gestures. His mother had reported to Teacher L that he responded to hand-under-hand manual signing; however, in the two years she had been working with him did not see this as an effective mode of communication.

Student S.

Student S was a seventeen year old male in Teacher R's classroom. He experienced multiple disabilities including cerebral palsy and deafblindness. He had a left side hearing loss and nystagmus, in addition to decreased acuity Teacher R reported that he used to wear glasses, but has not since his pair went missing months earlier. He primarily used a wheelchair for all mobility. Student S primarily communicated using gestures and single-word approximations. He was also observed using an AAC communication device with line-drawings, however, it was unclear if he understood what the symbols represented, as he would often just push items at random for a response.

Cases for this investigation were organized by teacher. Case one consisted of Teacher S and Student E and Student N, as they were in the same class. Case two consisted of Teacher L and Student D. Lastly, Case three consisted of Teacher R and Student S.

Data Collection

Data for this project was collected through observations, interviews and field notes. Collecting evidence from multiple sources supported the triangulation of data by establishing "converging lines of inquiry" (Yin, 2003, p. 98). Observations were captured with video taken as a teacher instructed a child or small group of children in a read aloud

literacy lesson. Following the observations each teacher was interviewed, according to the established interview protocol (Appendix A), about how their beliefs about communication and literacy, the learning objectives of the lesson, its components, the strategies he/she employed and their reasoning for working on those particular skills. Additionally, field notes were taken to capture any additional information related to the materials being used, necessary student information relevant to the research, staff/students involved in the activity as well as the date and time of the lesson.

Observations

Data was collected through observations to collect direct first-hand information as it was taking place within the setting (Creswell, 2015). Observational data allowed for an understanding of a phenomenon that was much greater than what could have been achieved through an interview (Patton, 1990), and provided useful information related to the topic of interest (Yin, 2003). The rationale behind collecting observational data was to articulate what was happening in the setting of interest, creating descriptions with great depth and detail so that an outsider was able to understand what was happening and how.

To better understand the literacy and communication skills being developed during a read aloud lesson, as a nonparticipant observer, the researcher observed teachers instructing their student with congenital deafblindness in a shared reading activity of commercial or teacher-made texts. This allowed the researcher to witness the phenomena being studied and the instructional strategies teachers were using during a read aloud lesson for their students with congenital deafblindness. Each teacher was observed conducting three read aloud lessons with their target student(s) for a minimum of 20 minutes, with no more than one observation per teacher being conducted in one day.

Teachers determined the most ideal day and time for the observations. Each observation was video recorded using a digital recorder and field notes were taken immediately after each observed lesson. After each observation, the video collected was transcribed in preparation for data analysis.

Interviews

"In-depth interviewing is the hallmark of qualitative research" (Rossman & Rallis, 2003, p.176) and allows one to share the inner perspective of a participant. Following the classroom observations a standardized semi-structured interview with open-ended questions was conducted with each teacher, where a list of questions was posed to each participant to minimize variation between the interviews (Patton, 1990). Face-to-face semi-structured interviews allowed for specific open-ended questions to be asked of participants related to the phenomenon of interest and also allowed for the interviewer to collect informal communication information, such as body language and facial expressions (Creswell, 2013). The interview protocol being used was consistent for all participants, containing the questions to be asked, necessary areas for clarification and probes that were used as necessary for clarification or elaboration of participant responses (see Appendix A). Interviews took place after all three observations had been conducted per teacher.

For this research, the teacher interviews were used to gain understanding of how teachers' knowledge about communication and literacy development for children with congenital deafblindness as well as an explanation for the strategies they chose to employ during the real aloud lessons observed. This allowed data to be collected related to the research questions of how teachers are supporting the communication and literacy development for their students during a read aloud literacy lesson and their beliefs

regarding communication and literacy development for children with congenital deafblindness. Interview questions looked to determine the specific communication and literacy skills teachers were targeting during this activity, the communication development strategies they were employing, as well as if and how contextual factors, such as the physical environment and instructional materials, were being incorporated and utilized during the lesson. This interview data provided information related to the teachers' perceptions and understandings of literacy instruction, instructional strategies used to promote communication development and the connection between the two as it relates to individuals with congenital deafblindness.

In order to capture an accurate account of participant responses, it is generally recommended that interviews be video recorded to capture relevant auditory and visual information (Creswell, 2015). After an interview the recording was played back so that the researcher could transcribe each session in preparation for analysis. After transcription videos were permanently deleted.

Field notes

Field notes were taken after the observations, as they provided descriptive information related to the physical setting, social interactions happening and the activity occurring (Patton, 1990). Field notes allowed for descriptive information to be collected that may not have been fully captured during observations about the participants, setting and activity (Creswell, 2015). In this current investigation, field notes were used to collect information related to the materials being used during the lesson (book being read, supplemental items), necessary student information relevant to the research, staff/students involved in the activity as well as the date and time of the lesson. The classroom layout,

physical attributes and adapted equipment incorporated in the literacy activity were also recorded using the field notes to determine if these elements affected the literacy activity's ability or effectiveness to support communication development.

Coding and Analysis

The data collected from this research study were analyzed using qualitative content analysis because it allowed for the "subjective interpretation" of the data and utilized a methodical process for the identification of themes or patterns that emerged from the coded data (Hsieh & Shannon, 2005). Specifically, conventional content analysis was used, which forgoes the use of predetermined labels or categories and allowed themes from the data to emerge, a typical strategy used in qualitative research that is known as "inductive category development" (p.1279). Using inductive analysis to study the natural variations in the data allowed for the consistent ideas that surfaced from the participants to become the categories of analysis, or the lens through the data was interpreted (Patton, 1990). Adopting an inductive method supported a more "data-driven" development and analysis of themes that was less influenced by the researcher's preconceived notions of the phenomenon of interest (Braun & Clarke, 2006).

The primary objectives of this research were to explore teachers' beliefs and practices related to communication and literacy development for children with congenital deafblindness within the context of a read aloud activity. The examination of the data was conducted using a cross-case analysis, where individual responses were analyzed across participants (Patton, 1990). Amassing and then analyzing individual items from each participant as a whole helped to determine if together they collectively "appear to share some similarity and deserve to be considered instances of the same 'type' of general case"

(Yin, 2003, p. 135). Individual interview questions were coded and then compared to one another to determine consistencies in the responses.

In qualitative research there is no single method to coding and analysis, however, similarities to exist between recommended practices from experienced researchers (Creswell, 2015). For the purpose of this study, the "Phases of thematic analysis" suggested by Braun and Clarks (2006) were used to identify themes within the data, which consist of: "(1) Familiarizing yourself with your data; (2) Generation of initial codes; (3) Searching for themes; (4) Reviewing themes; (5) Defining and naming themes; and, (6) Producing the report" (p.86). The authors caution that this is a "recursive" process that develops with time as opposed to a rigid set of rules that must be followed in sequence.

Familiarizing Yourself with Your Data

After transcribing the data, Braun and Clarke (2006) claim, "it is vital that you immerse yourself in the data to the extent that you are familiar with the depth and breadth of the content" (p.87). This initial read through of each transcript, or preliminary exploratory analysis, allows the researcher to gain a overall understanding of the data collected to gain a sense of how it is organized and to take note of any important details (Creswell, 2015). This included reading and making notes on the entire data set to actively identify any apparent patterns or potential themes that may existed. For the purpose of this research, transcripts from interviews, observations and field notes were read through after transcription and before coding in order to gain a sense of the material, the ideas being presented and also to allow the research to make notes about any interesting or important details.

Generating Initial Codes

Coding is the process through which the data is segmented and tagged to highlight the essential elements of the phenomenon under study (Braun & Clarke, 2006). Through this analysis, "labels for codes emerge that are reflective of more than one key thought. These often come directly from the text and then become the initial coding scheme" (Hsieh & Shannon, 2005, p. 1279). This is a systematic process that involved carefully going through the transcribed data and physically highlighting and labeling the segments of text that represent the root or essence of the information gathered and subsequently allowed patterns in the codes to represent the underlying themes.

Searching for Themes

At this phase in the analysis, the codes obtained from the data set were combined based on similarities they shared and their relevance to one another to begin the development of themes (Braun & Clarke, 2006). Through this inductive analysis, these codes were grouped by similarities and begin to form categories and patterns, which were then analyzed to identify any variations in the data (Patton, 1990).

Reviewing Themes

Once themes were developed it was then necessary to ensure that each theme was supported by the actual data, refining them as necessary, and additionally that the themes overall represented the entire data set (Braun & Clarke, 2006). The coded items under each theme related to one another and each theme was clearly distinguished from another. It was necessary to "cross-classify" some of the themes and collapse or divide existing categories, as well as create new categories that were not initially as apparent (Patton, 1990). For this

process a matrix was used to compare and refine the identified themes from the data and to create a thematic map.

Defining and Naming Themes

Once each theme was refined and clearly exemplified the data it represented, the final phase included identification of potential sub-themes and determining how the themes related to the research questions of the study (Braun & Clarke, 2006). Themes were identified for wach individual case, and then major and minor themes were identfied across cases. Major themes were consistencies that emerged across all cases, where minor themes were only found in two of the three cases.

Criteria of Soundness

Janesick (2000) clearly explains how "validity in qualitative research has to do with description and explanation and whether or not the explanation fits the description" (p.393). Specific practices are employed to establish fidelity in empirical qualitative research, such as triangulation of data and member checks (Brantlinger et al., 2005). Cross-referencing data sources with the themes that emerged from the qualitative research process, known as triangulation, ensured the accuracy and credibility of the study's findings (Creswell, 2015). As a means of validation, triangulation "adds rigor, breadth, complexity, richness, and depth to any inquiry" (Denzin & Lincoln, 2005, p. 5). Triangulating interview data with observational data and field notes may yield inconsistencies between what the individual said in the interview and what they did in the observation. These differences should not discredit one source over another, but rather highlight that the different sources captured different information about the experience that should be then analyzed to obtain further understanding about the phenomena being studied (Patton, 1990). Furthermore, when

triangulation of the sources leads to consistent patterns and explainable differences, it further adds to the credibility of the work.

For this study, triangulation and member checks were used as a means of establishing validity and credibility to the findings. Member checks took place by having all of the teachers interviewed validate that the transcripts from their interview were in fact a valid and a reflective representation of information they had shared. Additionally, interview transcripts were triangulated with field notes and observation transcripts to corroborate the themes that emerged from the coding schemas.

Researcher Positionality

Within their discussion of the politics of qualitative research, Denzin and Lincoln (2005) have powerful viewpoints on the essence of methodology: "Qualitative research is endlessly creative and interpretive… Qualitative interpretations are constructed… There is no single interpretive truth" (p.26). Thus, as a qualitative researcher it is important to be aware of one's personal beliefs and perceptions of the world, as these qualities influence the way in which one makes sense of the world. The greatest aspects of my life that influence my understanding and interpretation of the world are my upbringing as a first-generation American, in addition to the multitude of experiences I had working with children with severe disabilities as a special educator and as a university supervisor for pre-service moderate/severe special education teachers.

In the years 1962 and 1969 my father and mother immigrated to the United States from São Miguel, Açores, neither knowing a word of English. Over the years as they learned the English language and became increasingly assimilated into the American culture, each continued to respect the value and power associated with hard work and

education. Throughout my upbringing these values were instilled in me as I matured through school, college, graduate school and still today as I work to complete my doctoral studies. It is because of the many struggles my parents faced growing up in a foreign place and the high regard they each hold for the teachers who supported them along the way that I chose to pursue a career in special education.

My experience in special education started as a teacher in a hospital-based school for students who were medically fragile. Many of these students were non-verbal communicators and also had severe disabilities. That experience led me to work for a large inner-city district as an elementary school special education teacher in the multi-handicapped program and later as a program coordinator. My time in the classroom allowed me to see the importance of communication and how supporting a student to expand their communication abilities allows them immensely valuable opportunities for overall independence, while opening them up to more education opportunities and the chance at developing meaningful relationships with others.

As a special educator, I saw the importance of building literacy skills and communication skills in my students, and would frequently engage them in classroom read alouds that not only did the students find to be interesting and engaging, but the activities also promoted their development in the areas of communication literacy. I found that for my student with deafblindness, read alouds were more meaningful and engaging when they became tangible and easier to understand. I would always incorporate objects, actions, sounds and music into the reading of the book to help the student better understand the material and also become actively engaged in the reading process. Also, incorporating these items also served as a means to test comprehension as the story was being read. For

example, if there were two main characters in the story, I could pause after reading a certain section and ask a student to identify the character performing a certain action at that point, having the student select the picture I had been using while reading to represent that character. I found that when I made read alouds more interactive, accessible and engaging for my students, they not only learned more during the activity, but also thoroughly enjoyed it.

CHAPTER FOUR

RESULTS AND DISCUSSION

The intent of this investigation was to explore read aloud lessons for children with deafblindness to answer the following research questions:

(1) How do teachers use classroom-based read alouds to support communication and literacy development for their students with congenital deafblindness?
    a. How is the learning environment being utilized during the lesson?
(2) How do teachers' beliefs about communication and literacy development for children with congenital deafblindness influence the instructional approaches and strategies they use during a classroom-based real aloud?

Three teachers and four children with congenital deafblindness participated in the study. Teachers were observed conducting read alouds with their students and then participated in interviews following the three observations. Field notes were collected following interviews and classroom observations. After three observations and teacher interview were completed at a site, the interview was transcribed and emailed to the teacher participant for a member check. Approval was received for all cases, with the addition of Teacher S also providing a written response to a question that was unintentionally overlooked in the interview.

For this investigation, cases were organized by classroom, with the initial case including two students with the same teacher and the remaining two cases having one student and one teacher in each. The data are initially presented by case, followed by a cross-case analysis and discussion. Each case presentation will begin with a description of

the setting where the lessons were conducted. This will be followed by content on the interviews related to teacher beliefs and themes that emerged from the teacher interview. Next, interview data on teacher's instructional goals and strategies are presented followed by observational and field note data from the observed lessons. Then, themes that emerged related to the instructional strategies will be presented, followed by the presentation of themes that emerged from the data collected on the utilization of the learning environment. After each of the three cases has been presented, the cross-case analysis will identify themes that were consistent across the three cases related to teacher beliefs, instructional strategies and the learning environment. The chapter will conclude with a discussion of the findings.

Case One

In this classroom there were two students with congenital deafblindness, E and S, participating in the investigation. The interview data collected from this case revealed that Teacher S maintained very different instructional goals for each of the students with deafblindness in her classroom. Moreover, variety in the ways each student participated in the classroom read alouds was also observed, including differences in materials, utilization of staff, group size and content. However, even though there were some differences in how the students were involved, both Student E and Student N appeared to be alert and actively engaged in the read aloud lessons that were observed. The text used for the observations was obtained from the News2You curriculum. For the initial two observations the chapters were related to energy and the for the final observation the chapter was related to birthdays and baking a birthday cake.

Teacher S

Themes that were revealed related to teacher beliefs for Teacher S included: comprehensive understanding of deafblindness, understanding a connection between communication and literacy, and a practical/functional understanding if literacy for children with deafblindness. When asked about her training on deafblindness, Teacher S did not report receiving pre-service training from her credential program, but rather sought out information on her own regarding the implications of deafblindness:

> When we found out we were getting N we signed up for the OHOA modules. They were doing kind of like test runs I guess. We did the first 5 of those and then ever since then they have been inviting us back to test out all the new one they've been developing, so we've been doing all of them… I really think those modules, the OHOA ones, are just so informative. And I think that every teacher should have to do them. I feel like I learned a lot on how to help N. Like transition planning, what else… like different ways to have her interact with people? It had a lot of good tips for all that stuff. It was very valuable."

The training Teacher S experienced through Open Hands, Open Access (OHOA) is a series of training modules to train interveners that was developed by the National Center on Deaf-Blindness. It provides comprehensive modules on topics related to deafblindness, such as the effects of concomitant vision and hearing losses, communication development, instructional strategies, classroom supports, social skill development and many more (NCDB, 2016).

When asked about communication development for children with deafblindness, Teacher S mentioned that it was significantly affected by deafblindness:

> Well I know that it's [communication] significantly delayed, because it's been impacted by both hearing loss and vision loss, so you really have to compensate for that. They don't get a lot of incidental learning that a lot of other kids get so you really have to teach everything and not expect that they'll know anything about what you want them to learn. So, I guess that's it.

Teacher S's mention of not only the reduced opportunities for incidental learning children with congenital deafblindness experience, but also that as a result communication skills must be explicitly taught directly validates her comprehensive understanding of the topic.

Teacher S was also asked about literacy development for children with deafblindness. She stated:

> Well. I know that kids who are deafblind can be just as literate as anyone else… Hers [Student N's] is more functional literacy, like reading things on her schedule and understanding what's coming next and what she's supposed to be doing, what people are saying to her. Those are the big things for her. She's getting better with Braille. She can identify her name and a couple other words. But she is mostly symbol based, you know like objects and things to understand whatever the word is.

The response provided indicates that Teacher S holds a view of literacy for children with deafblindness that that expands beyond traditional notions of academic reading and writing, with more of a focus on practical and functional uses of literacy for communication. Once again, this directly connects to the strategies and supports that were observed, especially the use of total communication instruction that was seen with both Student E and Student N.

Table 1

Case One Themes

	Student E	
Teacher beliefs	Instructional strategies	Learning environment
Comprehensive understanding of deafblindness	Total communication with different levels of representation	Adapted materials
Connection between communication and literacy	Formative assessment	Technology
Practical / functional understanding of literacy	Consistent Scaffolding procedure	Peer tutor
	Connections to the real world	Minimization of distractions
	Positive reinforcement	
	Student N	
	Instructional strategies	Learning environment
	Total communication with different levels of representation	Adapted materials
	Communication modeling	Intervener
	Pre-teaching vocabulary	Peer tutor
	Generalizing concepts across settings	Environmental labels
	Positive reinforcement	

Lastly, Teacher S provided an affirmative response when asked if she understood there to be a connection between literacy and communication development for children with congenital deafblindness.

> I do believe there is a relationship between communication and literacy for children who are deafblind. Since so much of their communication is done via touch, the ability to understand and use symbols, braille, objects, calendars, and/or sign language directly impacts how effectively children with deafblindness communicate. Literacy is also a way to teach children with deafblindness more about the world, since they often miss information that other children learn incidentally.

This response is not only articulate but also consistent to her previous responses related to her understanding of communication development and of literacy for children with deafblindness.

Themes that emerged for Teacher S included a comprehensive understanding of deafblindness, knowledge of a connection between communication and literacy, and a practical and functional understanding of literacy (see Table 1). From the observations made, interview responses and field notes collected it is clear that Teacher S not only has a very comprehensive and thorough understanding of literacy and communication development for children with congenital deafblindness, but also how important it is to know of the interrelationship between the two. It appears that her beliefs about literacy and communication instruction not only influence the instructional strategies and supports she maintains in her classroom during a real aloud lesson, but also across curricular areas. The lessons observed appeared to be meaningful and appropriate for Student E and Student N to support their communication and literacy development through interactive, practical and supportive instructional strategies that are continuing to yield positive outcomes for both students.

Student E

The instructional goals for student E were described by Teacher S as "practical functional reading", which included word identification, responding to concrete "WH-" questions, such as "who?" and "what", and making improvements on drawing conclusions with a lot of support. "For E, it's mostly to focus on the comprehension. She is social and wants to be social, so it's more getting her to extend the vocabulary and be able to have more to say when she's in social situations." Throughout a read aloud, the teacher states she continuously pauses to ask E questions about the content and has her also identify key vocabulary. She feels that key areas for E in the area of literacy to focused on information that is concrete and relevant to her everyday experiences, such as being able to understand and follow the steps a recipe, as well as having the necessary tools, such as an extended vocabulary, to interact and effectively communicate with others socially.

When asked about specific instructional strategies for E, the teacher described that minimizing any distractions in the classroom were necessary for her success as a learner. Because she can be greatly distracted from auxiliary noise and even movement, the use of an FM system has also greatly helped her to focus and improve her attention during activities. "Trying to keep things quiet and not have a lot of stuff going on is really important for her." During the classroom observations, the use of the FM system was observed for two of the small group read aloud lessons but not for the third, which was whole class. For all of the observations the student was paired with a peer tutor, a general education peer used to support the student during instruction. Often the peer was observed helping the student to navigate multiple screens on the student's iPad to find the

appropriate page with the response options for the question just presented within the lesson.

The major themes identified in the instructional strategies used with Student E included: total communication instruction with different levels of representation, ongoing formative assessment, consistent scaffolding procedure, and connections to the real world and positive reinforcement (See Table 1). The use of total communication was consistently utilized across observations. It consisted of using an array of representations or communicative forms to display the information (vocabulary and story content) that ranged in level of complexity and provided multiple ways for the student to expressively share information. For example, when a new vocabulary word was encountered, the teacher paused to highlight the word by drawing attention to the written word paired with a line drawing, verbally stated the word for the students to repeat, had the students use their communication devices to state the word, and also demonstrated and had the students produce the manual sign for the word. If available, the teacher also incorporated the actual object (calculator, eggs, whisk) or made a real life reference to the word (e.g. pointing to the sun outside, demonstrating how to use a whisk in a bowl). This total communication approach to vocabulary instruction and concept development allowed the student to not only have an opportunity to experience different communication forms related to a specific term or concept, but also begin to use the form that they feel most comfortable using. As key information was repeated during the lesson, Teacher S would model different ways to represent the word, and have the student attempt to produce that particular form. The student then had access to a variety of communicative forms she could utilize to express the particular vocabulary word or concept. This not only allowed her to experience new

forms of a word, but to also attempt using different representations, or approximations of multiple forms, for example, attempting to say a word and also produce the manual sign.

The second theme identified for the instructional strategies used with Student E was ongoing formative assessment during vocabulary instruction and reading of the text. As Teacher S mentioned in her interview, after each page of text was read, she would check for understanding related to vocabulary and comprehension of the content presented. This happened in different ways during the observations. At times the teacher would ask the student to identify key vocabulary from the sentence that was just read using her iPad, producing the manual sign, stating the word or approaching the smart board to point to the line drawing. To test for comprehension of content, the teacher would consistently rephrase one or both of the statements from the text as a question after it had been read to the class, for example:

> Teacher: "Who would like to read page 1?"
>
> [Student E raises her hand]
>
> [Teacher approaches student E and presents voice-output device]
>
> [Student E activates device: "The sun is energy. Wind is energy"]
>
> Teacher: "What is the sun?"
>
> [Student E states what sounds like a verbal approximation of "energy" and holds hands up as to produce sign]
>
> Teacher: "Yes, the sun is energy [pointing to line drawing on smart board screen]. Energy [produces manual sign for "energy"]."
>
> [Student E again tries to produce the sign. Peer assists with hand over hand support]

The teacher assessed Student E's comprehension of the material being read and simultaneously reinforced the vocabulary being presented in the chapter throughout the lesson. Consistently, the student's response to this instructional strategy of highlighting key vocabulary and asking comprehension questions directly from the text would be to make an attempt to indicate the word, either by verbally stating an approximation, trying to produce the manual sign or selecting the line drawing on the iPad with support from a peer. This was observed multiple times across all of the observations, indicating that the student is familiar with the instructional strategy, and it is also a routinely occurring strategy utilized during a read aloud activity.

A third theme identified for the instructional strategies was the consistent implementation of a scaffolding procedure. When student E expressed an incorrect response for a vocabulary word or to a comprehension question, the teacher would provide least-to-most prompting to support the student to produce the correct response.

[Student E activates voice-output device: "The sun is used to make electricity. Some houses use the sun for energy."]

Teacher: "So E, what do some houses use for energy?

Student E: [no response - just looks at teacher]

Teacher: [approaches smart board and points to "sun" line drawing] "Some houses use the sun for energy. What do some houses use for energy?"

Student E: [continues to look between board and teacher] "hot"

T: "It does make us hot." [points to line drawing on smart board reads] "The sun" [also producing manual sign for "sun"]

Student E: [produces approximation of manual sign for "sun"]

The teacher is using a least-to-most scaffolding procedure to support the individual to be as independent as possible with providing the correct response. Once again, the teacher is using a total communication approach, providing all the available communicative forms for the word "sun" to the student in hopes that she will use one to respond to the question that was asked. There were times throughout the course of the observations, however, where the researcher questioned the level of complexity of the material. It appeared that the some of the concepts and vocabulary presented may have been at a higher level of difficulty than expected given the nature of Student E's level of development and thus, a much higher level of scaffolding from the teacher was necessary for the student to produce the correct response.

The fourth instructional strategy theme identified was meaningful connections made to real world items, events or concepts during instruction. When concepts or vocabulary words were being presented or revisited during the lesson, the teacher frequently would make a connection to a real world example:

> Teacher: "Want to read this one E?"
>
> Student E joins teacher at board. Teacher reads text "The sun gives heat. The sun gives light" pointing to each word and emphasizing key vocabulary words that are paired with line-drawing. The student follows teacher, repeating words with unintelligible speech and also touching each word.
>
> Teacher restates sentence read.
>
> Teacher: "E, what does the sun give?" [pointing to line drawing of "light"]
>
> Student E points to line drawing of "light and states a verbal approximation.

Teacher: “Light, that’s right. [looks out of window and points] It’s not very bright out now, huh? It’s getting there though. Still a little cloudy.”

Here is one example of Teacher S making a reference to the sun outside in connection to the concept presented in the text that the sun produces light. The teacher also incorporated objects and movements to make connections to additional vocabulary words and concepts.

The final theme identified related to the instructional strategies used with Student E was frequent and consistent positive reinforcement. After the student would provide a correct response, positive reinforcement would be immediately provided. Teacher S would frequently state phrases such as “Yay. Nice job” and “Very good E”, and other reinforcement such as clapping or high fives. The student appeared to be very happy to receive this feedback, often smiling and clapping along with the teacher.

Observations and field notes supported the development of themes related to the learning environment for Student E. These included the materials used for instruction, technology, support provided from peer tutors, and supports implemented to reduce distractions (See Table 1). Materials used during instruction included adapted text from a commercial subscription-based curriculum specifically designed for special education. Each page contained 1-3 simple sentences containing key vocabulary. In order to promote understanding, key vocabulary words were supplemented with line drawings above to promote understanding. Additionally, each page contained a large picture that directly related to the information being presented on that page. At the end of each 4-5 page chapter there were also comprehension questions supplemented with line drawings, that directly related to the information that was previously presented, with the questions having similar sentence structure as the previous text, and also including the same key vocabulary

presented. The text format and accompanying adaptations were consistent throughout all of the classroom observations.

Technology was also a theme identified related to the learning environment. This included high-tech items, such as a Smart Board, iPad and voice-output device. The Smart Board was used to display the pages of the book in a large format, and to make the reading experience more interactive where the students could touch the text for it to be read, and select responses to comprehension questions and receive immediate feedback. An iPad was used as a communication device, allowing the student to initiate a communication exchange, comment or respond to questions. The student would select a single line drawing to play a pre-recorded phrase. During the read alouds observed, the teacher often used a single voice-output device with pre-recorded lines of text to allow the student to "read" the material to the group.

The use of peer tutors during the read aloud were also seen as an important theme related to the learning environmental. Not only did the additional participants in the activity provide optimal 1:1 support for each student, the peer tutor was readily available to provide quick support to the student instead of the teacher interrupting the flow of the lesson. One specific peer tutor was assigned to work with Student E for the course of the school year and would frequently assist her to produce a particular sign using hand-over-hand support to locate a particular page/icon on the iPad, modeling the desired expressive communication form just as the teacher had. This also allowed for the student's communication attempts to be acknowledged and responded to in an efficient and consistent manner, while data was collected and a token-based behavior modification system implemented.

The last theme related to the learning environment for student E was the minimization of distractions. The learning environment was used in various ways during the lessons observed. As previously mentioned, adapted literacy materials, and technology (smart board, iPad, voice-output device) were utilized in all of the lessons. Other significant considerations noticed were the arrangement of the space and the use of peer tutors during the lesson. For the small group read alouds, the all the students were seated in chairs, in a half circle about 4-feet away from the smart board with either a peer tutor or instructional aide seated at their side. The teacher sat to the side of the smart board, facing the students. This allowed the students unobstructed visual access to the content being displayed on the smart board, as well as a clear view of the teacher, allowing access to what the teacher is saying as well as doing (pointing to something on smart board, producing a manual sign). The close proximity to the content helped the students access the material through visual and auditory senses to receive the information being presented, while also decreasing any potential distractions allowing them to remain attentive and engaged in the activity. Student E was an active participant in each of the observations from her seat and also at the smart board. Frequently she would interact with the teacher by responding to questions asked or by volunteering to read a page of the text. Additionally, having the teacher in the center of the activity allowed for quick and easy access to the students. This was essential as the teacher was continuously assessing for understanding and would quickly present the information in another way if it became clear that the student did not fully comprehend the information.

Student N

Student N was supported by her intervener, a dedicated 1:1 teacher's aide with special training in deafblindness, as she participated in read alouds led by the teacher. These lessons occurred in either small group or individual sessions. In her interview, Teacher S reported the instructional goals for student N to be about accessing the environment around her and interacting with other individuals:

> So for N, most of her goals are to just be a part of the group, because she's very internal and doesn't really reach out to people. She's been getting better over the last couple of years, especially with having peer tutors… Having to pass things to people and get things from people and understanding that everyone is working as a group, those are the big things for her.

Student N's intervener assists student N during instruction and also supports the teacher by specifically adapting and modifying materials to make them accessible to student N. When asked about the intervener, Teacher S stated: "For N, [the intervener] is just indispensible. I couldn't do any of this without her."

The main instructional goals for student N are to improve her expressive communication skills and support vocabulary acquisition. This includes interacting with other students, peer tutors and staff, through one-on-one interaction and participation in group activities, as well as improving her vocabulary by experiencing multiple communication forms during instruction, such as braille, manual sign and objects.

> [The intervener] is signing all the words [for student N], and we're incorporating that with all the kids so that they're learning the different signs and can be communicating with N just like she communicates. We use a lot of the symbols and

braille for N, having her touch the braille, touch the objects and then having her sign it and also feeling someone else sign it, aside from just [the intervener]. Again, bringing her outside of herself to understand that the rest of the world is communicating too.

The instructional strategies witnessed in the observations were consistent with those mentioned by Teacher S in the interview. Themes that emerged related to instructional strategies for Student N were: total communication instruction with different levels of representation, communication modeling, pre-teaching vocabulary, generalizing concepts across settings, and positive reinforcement (See Table 1). Total communication was a prominent theme related to instructional strategies for Student N, where multiple communication forms were presented to the student that ranged in level of complexity from concrete to abstract. For the key vocabulary of the lesson, object symbols were used to represent the terms. The object symbols that Student N uses are a mix of whole and partial representations mounted on plastic cards with braille labels (see figure 1). The student's intervener made the object representations to be used for the daily schedule, as vocabulary cards for read alouds, and for her communication board. When information was always provided to Student N using multiple communicative forms. For example, as text was read aloud by the teacher, the intervener would support Student N's fingers to scan over her copy of the book adapted with braille. When key vocabulary was encountered, the intervener would stop, sign the word to the student using hand under hand support and often reference the object symbol for that word. Each time a word was presented to the student it was spoken, signed and accompanied by a braille or object representation.

Communication modeling was the second theme related to the instructional strategies identified for Student N. Throughout the lessons, communication was modeled for Student N, providing access to multiple receptive communicative forms in a variety of ways. For example, when the teacher would ask a question to the class, the intervener would sign the questions the teacher asked the class into the students hands, using a hand-under-hand technique and then assist the student to produce a response by using a hand-over-hand technique, supporting the formation and movement associated with the sign. The student would then be asked to "tell" the teacher or her peer tutor her answer by signing it into their hands with the support of the intervener. Expressive communication was modeled throughout each of the observations, however, it appeared that the student did not have opportunities for independent practice, or rather, a chance to spontaneously produce/use some of the expressive communication forms that she had been demonstrated during the activity.

Figure 1: Object representations for Student N

The third instructional theme for Student N was the pre-teaching of the vocabulary before each read aloud. First the student was allowed to explore one of the objects independently for a short period of time before she was directed to feel the object, have her

hands scan the braille label, have the vocabulary word signed to her using a hand-under-hand technique and finally be support to produce the sign. Each time the student interacted with the symbol the name was also verbally stated. Once this had been done for all of the symbols (usually only 2-4) the process would be repeated, but this time the student would have to hand the symbol to someone else and they would then sign it into her hands a second time. The teacher stated that the process itself and its consistent repetition has supported Student N to learn the meaning of object symbols, especially those that she uses on a frequent basis, such as for her daily schedule, preferred activities and activities of daily living (feeding, toileting, etc.). Each time a term was mentioned, the student received it across multiple communication forms.

Generalization of concepts across settings was the fourth theme for Student N related to instructional strategies. During the lessons object symbols and real objects were incorporated as appropriate. The same representation used in the students schedule for "home" was incorporated into a reading lesson that talked about home. Each time an actual object was introduced, the process was similar to the initial sequence for the object symbols, with the addition of imitating the action that the object would make. For example, during a read aloud about cooking a bowl and whisk were mentioned. The actual objects were used as vocabulary during the reading session and the action of the whisk mixing an item in the bowl was performed. Later, during a related cooking activity, those same objects were used again for the actual task of mixing ingredients.

The final instructional theme that emerged for Student N was the use of positive reinforcement. This was observed through verbal praise and the implementation of a token behavior system. When Student N demonstrated more active participation in initiating an

interaction or in producing a manual sign the teacher or intervener provided verbal praise generally, such a simple "good job", or more specifically related to the action performed, such as, "Great job N! You signed 'oil'". The use of a token system was also observed. Each time the student competed a piece of the activity she received a penny to Velcro to her chart, with 10 pennies earning her a preferred activity she had selected prior to the start of the activity.

Themes related to the learning environment also emerged for Student N from the observations and field notes taken. These included adapted materials, the intervener, the peer tutor and environmental labels (See Table 1). Related to the theme of adapted materials, specific items were used for Student N during the read aloud lessons, as well as to transition to/from the lesson. A sequential "first/then" activity schedule consisting of the objects demonstrated in figure 1 was used to transition between activities. After an activity was completed, the student removed the velcroed symbol and placed it into a "finished" pocket. During the read aloud, materials such as voice-output devices (big mac/jellybean switches) with text and braille labels, text adapted with braille, and vocabulary cards similar to the schedule items pictured in Figure 1 were used.

The use of the intervener was a prominent theme within the learning environment. Throughout each lesson observed, the intervener served at the communication mediator between the student and the rest of the class. As Teacher S mentioned in her interview, the intervener was a key support for Student N. Under the teacher's direction, the intervener created the object representations, brailled the literacy materials and supported the student's communicative acts. For 1:1 activities with the teacher or in small groups, the intervener sat alongside Student N to best support her. Because took Student N longer to

identify the symbols in front of her and to make a selection for a response, the intervener began the process and appropriately provided the student with the necessary wait time so that the teacher did not need to disrupt the flow of the small group or whole class lesson.

Having a peer tutor support Student N during read alouds was an additional theme identified for Student N. The peer tutor working with Student N is a consistent individual that was only informed about the implications of congenital deafblindness on the learning process and communication, but this is also her second year working with Student N. Being familiar with the individual, how her functioning has been affected because of her disability and the communication style she uses allows her to more effectively support Student S compared to another peer with less understanding. Working with the peer tutor also allows Student N opportunities to meaningfully interact with a peer using a communication form that is mutually understood.

Lastly, the use of labels throughout the classroom was another theme that emerged from the learning environment. This included labels for the different areas of the classroom as well as name signs for certain individuals that have frequent interactions with Student N. Object representations were used to label certain areas of the classroom (literacy area, work tables, bathroom, kitchen, exit). These symbols were associated with the symbols used in Student N's schedule and were a part of how she transitioned from one area/activity to another (matching symbol in schedule to room label). Additionally, name signs were also observed for each of the individuals that the Student N most frequently interacts with (mom, dad, teacher, intervener, peer tutor and speech therapist). The student produced loose approximations of these signs that were interpreted by those around her. When one of her familiar communication partners approached the student, they took her

hand over theirs as they produced their name sign, while also verbally stating it, helping the student to identify with whom she was interacting with. Both the section labels as well as the name signs appeared to be important environmental adaptations for Student N.

Case Two

The read aloud lessons observed at the second school site were very routine and consistent across visits. Each started with vocabulary instruction, followed by the text being read by either the teacher or electronically, and ending with the answering of comprehension questions. For the first visit, Teacher L was working with Student D 1:1 for the entire lesson with an aide leading the small group, where as for the subsequent visits, Teacher L ran portions of the small group lesson while Student D's 1:1 aide supported him for those portions of the activity and then Teacher L would work individually with the student. Student D was alert and an active participant in each of the observations. The text used for each of the observations were adapted chapters from Tom Sawyer obtained from the Boardmaker Share website.

Teacher L

After the classroom observations were conducted, Teacher L was interviewed regarding her beliefs about communication and literacy for children with congenital deafblindness according to the established protocol (see Appendix A). When asked about the training she had received in deafblindness, Teacher L stated:

> No classes in my credential program. I did, when we first got the student that I have, I went thought the intervener training. I didn't completely finish it, because I took it over the summer and when school started I fell behind. So I didn't finish all of the modules, but I did get some good stuff from the intervener training.

Follow-up questions revealed that the training she received was the Open Hands, Open Access training through the National Center on Deafblindness (2016). The teacher did not elaborate on specifically which modules she had completed. However, even though the teacher did not complete the entire program, the strategies she used and described for Student D were very appropriate for an individual with congenital deafblindness, including the presentation of the material, the scaffolding used during instruction, the accommodations and modifications used, and also the apparent communicative focus of each activity.

When asked about communication development as it related to children with deafblindness, Teacher L mentioned accessing the student's residual vision and hearing, as well as differences in abilities and expectations for expressive and receptive communication that has led to the use of technology.

> I think that because he can hear and see some we do rely a lot on those senses to be able to teach him communication and he does seem to be taking off, at least as far as communicating using his iPad. He can do it and then maybe receiving communication he may be better with the sign language. Mom has done that [signing] with him his entire life… But the problem is motorically, I don't know if it's a motoric or cognitive reason, he doesn't put out as much sign as are given to him. The thought is that he understands, or may understand, everything that is provided to him in sign language. But before we started using the iPad with him, he really wasn't communicating much that we could see.

The strategies observed during the lessons attest to Teacher L's statement about using the student's available senses. Because of his motor limitations, the student was struggling to

produce manual signs, and therefore very limited in his expressive communication abilities. Working with the speech pathologist, Teacher L began to supplement the student's expressive communication with the iPad, incorporating into interactive classroom activities, such as read alouds. As observed and previously mentioned by the teacher, the student is encouraged to use the iPad throughout the activity to interact with others, accessing the device using a gesture he can easily produce, rather than manual signs that may be very difficult for him to accurately demonstrate. Teacher L reported that read aloud activities have proven to be a very effective time to develop this communication skill.

When asked about her understanding of literacy for children with deafblindness, Teacher L initially stated it to be related to understand the information surrounding the individual. When asked to elaborate, she mentioned:

> Yeah, so the content of the story, or really anything. I'm trying to think of anything… him understanding anything that's all part of it. I guess my hope for D is that when everything is in place, he's got his hearing aides and his FM's, that he really is taking in everything that we're putting out there. Because I don't know for sure. But at least with those things in place, it increases the likelihood that it's happening.

Teacher L appeared to be describing her literacy beliefs for Student D to be related to his ability to access the information that is being presented to him using his residual vision and hearing abilities in addition to his other senses.

When asked about the connection between communication and literacy for children with deafblindness, Teacher L agreed that there is a definite connection and explained:

> For D in particular, I think it's understanding what is presented to him, maybe not necessarily understanding every single word that's written or spoken, maybe not understanding all of that, but understanding the basic communication that comes from literacy. And then, of course, being able to communicate the literacy that he understands. You know, that's a challenge. He does pretty good with answering comprehension questions with a 50% chance. He does ok with that. I'm not totally sure he's always selecting the correct answers, that he's intentionally selecting the correcting answers, I'm not quite sure of, but we go with it and he seems, if he's not sick, he seems happy to complete those activities.

Here, it is clear that Teacher L believes communication and literacy to be very closely related, with an important feature being the interactive nature of the two. She described that information on a topic has to be received by the individual in a way that they are able to understand it, so that the individual can then share information on that topic as well. For this process to happen, the individual must have some means of receptive communication in order to receive the information being shared, as well as a means of expressive communication to articulate their understanding of the information, and possible new ideas. The interactive nature of the read aloud lessons observed and the embedded communication skills witnessed throughout the activities seen in Teacher L's classroom provide support to her statement that she understands there to be a strong relationship between communication and literacy for children with deafblindness.

Themes that emerged from Teacher L's interview include: comprehensive understanding of deafblindness, understanding a connection between literacy and communication and a practical/functional understanding of literacy (See Table 2). Teacher

L shared her comprehensive understanding of deafblindness as she described how residual hearing and vision must be targeted and her description of expressive and receptive communication supports. A clear connection between communication and literacy was described across multiple questions, as well as the notion that literacy for a student with congenital deafblindness should be functional and focus on understanding the representations that one may be receiving and sending.

Table 2

Case Two Themes

	Student D	
Teacher beliefs	Instructional strategies	Learning environment
Comprehensive understanding of deafblindness	Total communication with different levels of representation	Adapted materials
Connection between communication and literacy	Focus on Communication Process	Technology
Practical / functional understanding of literacy	Errorless learning and prompting	Proximity of materials
	Attention to the material	
	Consistent lesson implementation	
	Positive Reinforcement	
	Focus on glasses and hearing aides	

Student D

When asked about the instructional goals Teacher L had for Student D, she mentioned a focus on the communication process and participation within group activities.

> I don't believe that he's going to be putting together sentences, but for him to participate in that activity allows him to work on that goal of isolating that finger and making selections. Just the whole idea of kind of the cause and effect of communication: I touch a symbol, or I touch a word on that and it says it. That's perfect for him.

The instructional goal was to have the student produce a pointing hand gesture and reach for the desired option, activating the cell on the screen with just his index finger. The focus was on building the 1:1 correspondence between the various representations used to indicate the word or concept being presented.

When considering the instructional strategies used with Student D, the teacher mentioned the proximity of the materials to accommodate for his visual impairment, as well a consistent prompting hierarchy during instruction.

> I always use the visuals up close. It's not felt that he sees the big screen, so we try to always provide him with a close up version of whatever is going to be on the big screen, so that's one thing that we do with him… Strategies with prompting, we really try to, of course, give him the least amount of prompting as necessary, and some times you have to full on do hand-over-hand with him, but then trying to back away, coming down his arm and having him making the selections.

When involved in the small group portions of the lesson, visual supports were having the student's laptop in front of him displaying the same information that was being projected onto the smart board and using large vocabulary cards that had the written word as well as a line drawing. For one-on-one portions, the student would have his iPad and/or laptop directly in front of him to better access the information on the display. Adjustments on the

student's positioning, distance from the workspace and for the positioning of his devices were constantly being made during all aspects of the lesson to maintain optimal viewing conditions for the student.

Teacher L also indicated more instructional strategies used with Student D later in the interview:

> Sometimes when the stories are such where I can do stuff with it, like we did a story on Easter and spring and all that stuff. The story talked about how in Easter the flowers come alive and whatever, so I brought in flowers, had him smell the flowers along with everyone else. He couldn't eat the candy, but there's a certain kind of candy he can eat. I brought in Easter candy because some people celebrate with candy. So bring in examples of stuff works. I think that's helpful. Some of the stuff I do doesn't always lend itself to that, but I do the best that I can do.

Through the examples shared, Teacher L described the strategy of incorporating meaningful and tangible representations to support understanding of the information being presented during a read aloud lesson. This can support the student's comprehension, vocabulary acquisition, and generalization of the material across contexts.

Themes related to the instructional strategies that were used with Student D included: total communication with different levels of representation, focus on communication process, errorless learning with a consistent prompting hierarchy, attention to the material, consistent lesson implementation, positive reinforcement and attention to glasses and hearing aides (See Table 2). Consistently throughout the vocabulary instruction portion and reading of each lesson, total communication instruction was observed using representations that ranged in their level of complexity. As a vocabulary word was said to

Student D, the teacher would sign the word to him using the hand-under-hand method of having his hands on top of hers as she signed the word. Next, the word would be verbally repeated as a vocabulary card was presented to him containing the printed word and a line drawing. Lastly, the student would be asked to find the word on his iPad, demonstrating a pointing hand gesture, from an array of three cells, one containing the printed word and line drawing for the word. This process was repeated for each vocabulary word and witnessed across lessons. The vocabulary word presented were the key words that were used in the reading of the story that followed, as well as in the comprehension questions at the final portion of the activity.

Even through a variety of representations that ranged in complexity were used, the researcher at times questioned the complexity of the vocabulary being presented and some of the representations being used. Instruction of complex vocabulary words without concrete referents such as “trouble”, “true”, “worry” and “forgot” were a part of the lessons and appeared to be very advanced concepts for Student D to understand without tangible representations. This potentially may have supported his understanding of these complex vocabulary words by including a concrete representation. Additionally, Teacher L mentioned in her interview that objects were often incorporated into the activities when available, however, during the course of the three observations no objects were included.

The second theme that emerged from the observed instructional practices used with Student D was the focus on the communication process. Throughout the three lessons, having the student isolate his finger to select an option was clearly observed as a key intention of the activity. Whether it was to advance the page on an electronic book on the laptop, select a cell on the iPad or point to a word on the smart board, the student was

encouraged to “get his finger ready” or “use your pointer finger” each time, with the focus being on the process of making a selection, rather than the option he was selecting. Teacher L explained this strategy in her interview, stating that the intent was on developing the 1:1 correspondence between the vocabulary word and the item on the student’s communication device, or the icon on the communication device and its associated action (i.e. advancing the page once the text has finished being read).

The instructional strategy of errorless learning with a consistent prompting hierarchy was also identified as a theme. The primary instructional goals for Student D were to participate in the activity and make selections on his iPad/laptop. Each time a question was presented to the student, he was encouraged to make a selection on his device, with the least amount of support provided to him being physical support under the forearm so that the teacher could guide him to the correct response. The expectations for Student D were that he would maintain visual attention, produce a pointing hand gesture, and reach towards the screen of his device, rather than answer correctly. The teacher would often model a response for the student before asking him to respond. When selecting a response, feedback included the device stating the word, as well as positive reinforcement from the teacher. More intense levels of support ranged from physically prompting him to isolate the index finger towards supporting him to maintain the hand gesture and reach towards the screen. On all observations there were times where he independently produced the hand gesture and maintained it as he reached towards the screen to make a selection. Additionally, after each of the lessons, as reinforcement for participating, Student D would be allowed to watch preferred videos on his laptop for set amount of time. In order to activate the videos he would have to select the cell with the picture of the character in the

video from an array of three, with the other two cells containing the line drawing “no”. Each time this was observed, he maintained visual attention, produced and maintained the pointing hand gesture, and guided his hand to make a selection with almost full independence.

At the start of each lesson, Student D required relatively more frequent prompting to look at the material and make a selection using his index finger. However, as each portion of the lesson progressed, he became much less prompt dependent, and even demonstrated some independent selections using the correct hand shape. Maximum independence was always encouraged with a least-to-most level of prompts being provided consistently by the teacher and dedicated 1:1 aide. The different arrays of prompts were observed from Student D independently making a selection or advancing the page at the proper time without being asked, to his requiring support to not only reach toward the screen, but also hand-over-hand support to isolate his index finger to produce a pointer hand shape. However, each time an opportunity was presented to make a selection and perform the action, appropriate wait time was allowed before any support was given and as the level of prompting increased.

An additional theme that emerged related to the instructional strategies for Student D was a consistent focus on his attention to the material. Verbal and physical cues would be given to the student to encourage him to visually attend to the material as a story was read or before he was asked to make a selection. This strategy was observed consistently across the three observations, with the teacher waiting until Student D was looking at the screen of his laptop or iPad before proceeding with the activity.

Another theme that emerged from the observed instructional strategies was related to the consistent structure of the lesson. A clear structure and routine was observed across all of the lessons, with each having a clear beginning, middle and end. As mentioned earlier, each read aloud began with vocabulary instruction that pertained to the text being read during that session, reading of the text, followed by comprehension questions asked about the content of the story. The student was continuously encouraged to actively participate in each aspect of the lesson by making selections on his iPad or touchscreen laptop.

Positive reinforcement was also a theme that emerged from the instructional strategies observed. Consistently Student D was verbally praised when he produced a pointing hand gesture or made a selection on his device. The teacher would affirm the student's action as well, for example, "Good job. You reached for the word 'carry'. You said 'carry'." This occurred each time the student made an effort to respond independently, or semi-independently.

The final theme for instructional strategies was the importance the teacher placed on the student wearing his glasses and hearing aides during the lesson. Throughout all of the observations, if the student removed either, the lesson would stop for the teacher to adjust the glasses or hearing aides and then help the student to put them back on. The attention that the Teacher L to having these devices in places connects to the statement she made in her interview about the importance of utilizing the residual vision and hearing of a student with deafblindness during instruction. This also related to Teacher L supporting the student to access the material and lesson, which would not only be much more difficult without his glasses and hearing aides, but also is a prerequisite for engagement.

Themes related to the learning environment were also identified through the observations and field notes collected. These consisted of the adaptation of the materials, use of technology and proximity of the material (See Table 2). Specific materials were used during the read aloud lessons. First, the text used was Tom Sawyer, which had been adapted from grade-level through a substantial reduction in length, simplification in content and the incorporation of photographs and sound effects. Each page of the text contained 1-3 simple sentences and a large photograph, with the key vocabulary words supplemented with line drawings above them. Additionally, sounds effects were also incorporated where relevant. For example, a "splash" sound was heard after text was read stating that the characters had jumped into a river.

A second theme related to the learning environment that emerged was the use of technology. For each lesson the material was presented to the student electronically in different ways. The stories were displayed simultaneously on the smart board and on the student's touchscreen laptop, while the iPad was used as an AAC device. Whether accessing the smart board, touchscreen laptop, or iPad, the student was required to touch the screen of the device to read the material, advance the page of the text or to make a selection for a vocabulary word. Technology was used in all aspects of the lesson.

The iPad was also used as a communication device for the student, with specific adaptations made to how the material was presented.

> We do everything with the yellow background and the black lettering, just because we've heard that's what, you know that's how is iPad is arranged and that's the way I do the stories. I just make the stories that way for everyone because if it works for him it will work for everyone. That's another strategy that we use for him.

Presenting the content with this contrast was confirmed through the observations of the student's communication boards on the iPad and the presentation of the text, regardless if it were on the student's personal device, or the smart board displayed for the entire group.

The final theme related to the learning environment was the proximity of the materials. As mentioned earlier, Teacher L stated in the interview that proximity of the materials supported Student D's visual attention. This was observed to be true, as well as attention being paid to the student's physical positioning throughout each of the activities. Many times throughout the a portion of the lesson, the teacher or 1:1 aide would reposition the student, explaining that they were attempting to optimize his visual, auditory and tactile access to the material. Different positions were also used for different components of the read alouds, such as ensuring that he was seated at a lower table when he was expected to activate the screen oh his device with more independence, such as to advance the page on the story. Also, the adult working with Student D was always observed sitting to his left side in order to be closer to his left and stronger ear.

Case Three

Typically, Teacher R works with Student S individually on literacy three times a week. Because Student S can be highly prone to distraction, this typically happens in an empty classroom while the other students are included in general education. The content of each of the three observations varied, however, Teacher R demonstrated consistent strategies across the three observations and Student S was alert and actively engaged in the activities. For the first two observations the teacher read from the children's chapter book *Bud, Not Buddy* written by Christopher Paul Curtis. For the final observation a story about recycling from the adapted curriculum News2You.

Teacher R

After the three classroom observations took place, Teacher R was interviewed. Questions were asked about his understanding of deafblindness, communication development, literacy, the instructional practices he utilized during the observed read aloud lessons and the materials used. When asked about his training and experience related to deafblindness he stated:

> I do not recall having any in-services during the course of my career. I believe during the course of my credential, discussions about deafblindness was incorporated within one or maybe 2 of the classes as we were talking about the 13 IDEA categories. I did not have a specific course about that.

Teacher R reported little formal training related to deafblindness outside of his credential program. The content covered on deafblindness consisted of discussions about the incidence and effects of deafblindness as a part of a course exploring the disability categories related to special education law. Following the interview, a follow-up conversation revealed that the instruction of children with physical, health and sensory impairments, including deafblindness, was covered in detail within another course later in his credential program. Teacher R also reported seeking information on his own about the effects of deafblindness later in his career.

When asked about his understanding of communication development for children with deafblindness, Teacher R reported that he saw there to be a similar developmental progression to that of typically developing individuals.

> I think their progression of learning to read is going to follow what would be typical. So their receptive skills would be first, and then their expressive skills, and

then will come their ability to perhaps have sound/symbol associations. Probably starting off, for S in this case, more with symbols, rather than letters.

When asked a follow-up question regarding the types of symbols he was referring to, Teacher R described a variety of representations, including objects, pictures, and line drawings. He explained that communication development begins with making associations between a representation (word, object, picture) and its referent (item, action, activity), or in other words, developing an understanding of the meaning of symbolic representations.

Teacher R then explained that the training he experienced in the area of literacy came from a variety of sources.

> I've had in-services. Mostly with slightly higher reading levels. I've also had the one course when I received my first credential, that was back in the 80's, which I don't remember much from to be quiet honest. I think going into this field has sparked more of an interest in reading and the acquisition of those skills. So it's mostly through readings I've done on my own, as well as attending in-services.

Teacher R's initial training in literacy took place through his credential program and in-services through his school district. However, as his career in special education began to involve working with children with more significant support needs, he began to seek information on his own from practitioner-based research publications. This included researching literacy practices and skill acquisition for children with significant disabilities. Later, through an informal conversation following the interview, he also mentioned a recent in-service on instructional strategies for vocabulary development and read alouds for students with multiple/severe disabilities provided through the Center on Secondary Education for Students with Autism Spectrum Disorders.

Regarding literacy development specifically for children with deafblindness, Teacher R explained:

> I would say that literacy development is what I said previously: that the receptive skills, in terms of literacy, would be first, S is, in my opinion, doing well in that phase and ready to go into the more expressive, as well as the sound symbol. I think he's got the picture piece. I think it more whether or not he's motivated at that particular time to use it… I think it's going to be very similar, but just more applied to the communication development. So in other words, it's going to be the receptive, expressive, and then going into the more written forms, which would be the final stages.

He explained literacy development for children with deafblindness to be similar to their communication development, focused on developing symbolic representation, starting with a receptive understanding of the representations before moving towards using them expressively. Teacher R also described a developmental progression for skill acquisition, where one skill must be acquired before progressing to another, in addition to starting with developing an understanding of more concrete representations, such as pictures, before moving to more abstract representations, such as line drawings or text.

Teacher R understood there to also be a significant connection between communication and literacy for children with deafblindness.

> Yes. I believe there is a relationship, because there is such a strong connection, especially for students who are deafblind. Probably by default, I would say, they probably have been read to for most, if not all of, their lives and that transition to

themselves reading, or using more independently their literacy skills is kind of plateaued, not necessarily always because of their ability.

He not only clearly indicated there to be a connection between communication and literacy, but that children with deafblindness may also have more limited opportunities to engage in literacy and develop the necessary skills needed to access literacy activities more independently.

Table 3

Case Three Themes

	Student S	
Teacher beliefs	Instructional strategies	Learning environment
Focus on receptive and expressive communication	Total communication with different levels of representation	Positioning
Connection between communication and literacy	Response to communication initiations	Proximity of materials
Communication and literacy as a developmental process	Formative assessment	Supporting attention
	Wait time	
	Positive Reinforcement	

Themes that emerged for Teacher R across the interview and observations were a focus on expressive and receptive communication, understanding there to be a connection between communication and literacy for children with deafblindness, and communication and literacy skill acquisition as a developmental process (See Table 3). His limited training in deafblindness may account for his failure to mention specific teaching strategies for

children with deafblindness, or the importance of accessing the individual's residual vision and hearing during instruction to promote optimal access to the material.

Student S

When asked about the instructional goals for Student S, Teacher R stated that vocabulary development and encouraging him to use his voice-output device were the main foci when they read together.

> This last day I was thinking about it as I'm going through this process and thinking maybe I need to push him a little more on his own vocabulary, even if it's just pictures with the words above them, and seeing if we can expand that. I know that we are also working concurrently with his communication device... So trying to reinforce his use of that machine versus his uttered words, which are really parts of words that we understand him to be saying, as well as his head gestures and hand gestures. So I think we need to keep reinforcing the use of that device.

As teacher R explained, Student S typically expresses in utterances and gestures that are often very difficult to understand. His diagnosis of cerebral palsy has left him with very limited fine motor hand use, making manual signing an inaccessible expressive form of communication for him. Thus, the main instructional goal for Student S across subjects has been to increase the use of his device, with an ultimate goal of having him be more consistent and accurate in his responses when using the device. In addition to the focus on device use, Teacher R also describes an instructional focus on supporting Student S to make connections between communication forms or representations for the same referent. For example, supporting the student to make the connection that the line drawing for "music", a photograph of the student's iPod and the actual iPod all represent the concept of

listening to music, which is a preferred activity the student chooses to engage in daily as a part of his token-reward system.

The following themes related to the instructional practices Teacher R utilized with Student S emerged: total communication instruction, response to communication initiations, formative assessment, wait time, and positive reinforcement (See Table 3). Total communication with different levels of representation was observed with the student's responses and the way the information was presented during observation three. The student's expressive communication spanned across multiple forms and levels of representation, including vocalizations, gestures, pictures, line-drawings, and his AAC device. During the first two observations the information was exclusively presented verbally as the teacher simply read to the student from a chapter book. Intermittently, the teacher would pause and ask the student simple comprehension questions, initially encouraging the use of the AAC device and later having the student slap one of the teacher's hands to indicate his selection of the two options presented. For the third observation, a commercial adapted text was used, with the information presented verbally, as well as with text, line-drawings and pictures. Teacher R would change the communication form when the student's response was unclear, for example, if the student nodded "yes" to both options of a question verbally asked, the teacher would then ask him the same question, but this time have the student point to the correct answer.

In his interview, Teacher R reported that Student S used a variety of "symbols" for communication. When asked to clarify what he meant by "symbols" he mentioned line-drawings, pictures, objects and photographs of real objects. However, across the observations only line-drawings on his AAC device and some pictures paired with the text

used in observation three were noticed. The use of only more complex and abstract representations during the read aloud lessons that were potentially less accessible to the student may account for the inconsistent and inaccurate responses the student provided to the comprehension questions.

An unexpected and very salient theme that emerged from the data was the teacher's responses to the student's communication initiations. Each time the student would initiate a communication exchange, whether by producing a vocalization, word approximation, gesture or word using his AAC device, the teacher would promptly acknowledge and respond to the attempt. When the message the student shared was difficult to understand, the teacher would supplement or rephrase what was shared to make the message more easily understood by others. Most often this took place during the reading portion of the observations when the student would become distracted. Teacher R would acknowledge the attempt, respond and then redirect the student back to the task at hand.

The third and fourth themes related to the instructional strategies the teacher utilized during each of the read alouds observed were conducting ongoing formative assessment and wait time. Consistently, Teacher R read text and then paused to ask the student a simple comprehension question about what was just read. These were typically "Wh-" questions about the sentence that was previously read, in either a yes/no format or with an array of two choices. Each time a question was asked, Teacher R demonstrated adequate wait time for the student to listen to the question being asked, scan the available options and then make a selection. As mentioned in his interview, Teacher R reported that the instructional focus of the lesson was on the process of communication and having the student respond to questions when asked, with a preference for use of the AAC device.

The final instructional theme that emerged from the data was the use of positive reinforcement. Student S was provided positive reinforcement in the form of verbal praise and stars on his token chart where 10 stars yielded a preferred activity after each lesson. Praise and tokens were provided most often for responses to questions and maintaining attention to the activity. Verbal praise was consistently provided each time the student initiated a communication exchange, used his AAC device or responded to a question the teacher asked. Statements such as, "yes, that's right", "thank you for trying" and "good job sitting up" were frequently used.

Themes related to the learning environment also emerged from the observation and field notes collected and included positioning, proximity of materials and supporting attention (See Table 3). The theme of positioning relates to the attention paid to the physical positioning of the student during the lessons (i.e. sitting upright in his wheelchair or prone stander). Teacher R continuously made adjustments to both throughout the observed lessons to ensure the student was in an optimal physical position and ready for instruction. The second theme that emerged was the proximity of materials. This included ongoing adjustments to the materials that included bringing the student's AAC device closer to him so that it was easily reached during the lesson, and adjusting the text or response boards so that it was within the student's visual field and in close proximity to compensate for his decreased visual acuity.

The theme of supporting attention also emerged from the data collected on the learning environment. As the student would begin to become distracted, Teacher R would alter the environmental arrange to support the student attention to the task at hand. This included making adjustments to the angle of the student's chair, the teacher repositioning

himself, or minimizing other environmental factors that may become distracting. Examples include the teacher typically conducting literacy activities 1:1 with the student in an empty classroom, as well as having the instructional aid join the lesson when Student S became fixated on her presence in the classroom. These changes appeared to be very effective in redirecting the student's attention back to task when he became distracted during the lessons observed.

It was anticipated that adapted materials would also emerge as a theme for case three, as it did with cases one and two. However, as mentioned earlier adapted materials were only used during the final observation. Observing the accuracy and consistency of the student's responses across the three observations led the researcher to question if the content and options for response were accessible to the student. The content of the initial two lessons was text read from a grade-level chapter book and seemed too high for the student based on his inconsistent responses to the questions such as using his AAC device to produce unrelated responses or always selecting the first option for response the teacher presented. Also, the cells on the student's device and the response board were approximately one inch square in size, containing a line-drawing and text label, which is difficult for an individual with 20/20 vision to see, and even more challenging for an individual with a visual impairment to access. Even when the commercially adapted text was used in observation three, the student seemed unintentional when selecting a response from the response board, usually swatting at the paper and looking at the teacher.

Cross-case Results

After each case was analyzed individually and cross-case analysis was conducted to see what themes emerged across the three cases in the areas of teacher beliefs, instructional

strategies and learning environment. The results are presented below in Table 4. Prominent themes that were observed across all three cases are indicated in bold, whereas the remaining themes were only observed in two of the cases in this investigation.

Table 4

Cross-case Themes

TEACHER BELIEFS	INSTRUCTIONAL STRATEGIES	LEARNING ENVIRONMENT
Connection between communication and literacy	**Total communication with different levels of representation**	**Adapted materials**
Comprehensive understanding of deafblindness	**Communication Modeling**	Technology
	Positive Reinforcement	
	Formative assessment	

Note: Items in bold indicate prominent themes that emerged across cases

Related to teacher beliefs, the major theme that emerged was that each teacher understood there to be a connection between communication and literacy. When specifically asked, each teacher made reference to the connection between communication and literacy for children with deafblindness relating to having an understanding of a variety representations at different levels of complexity (gestures, objects, photographs, line-drawings, manual signs, print) and have the ability to exchange the representations they understand to communicate with another individual. For example, Teacher S explained how understanding a variety of representations could support incidental learning by stating:

> The ability to understand a use symbols, braille, objects, calendars, and/or sign language directly impacts how effectively children with deafblindness

> communicate. Literacy is also a way to teach children with deafblindness more about the world, since they often miss information that other children learn incidentally."

Additionally, Teacher L described how communication and literacy interact:

> I think it's understanding what is presented to him, maybe not necessarily understanding every single word that's written or spoken… but understanding the basic communication that comes from literacy. And then, of course, being able to communicate the literacy that he understands.

Lastly, Teacher R mentioned, "a strong connection [between communication and literacy], especially for student who are deafblind". While each of these statements demonstrates that each of the teachers within this investigation hold a collective belief that there is a solid connection between communication and literacy for children with deafblindness.

A sub-theme that emerged from teacher beliefs was a comprehensive understanding of deafblindness, noted from interview data from Teacher S and Teacher L. The emergence of this theme may potentially be correlated with the training both received in deafblindness through the National Center on Deaf-Blindness. For both teachers, when they learned that they would be receiving a student with deafblindness they began participating in the Open Hands, Open Access modules (NCDB, 2016). The data collected from their interviews, observations and field notes indicated that each of these teachers hold a comprehensive understanding of deafblindness, especially in the areas of communication development, incidental learning, symbolic development, as well as appropriate instructional strategies. Additionally, each teacher indicated the importance of utilizing residual vision and hearing

during instruction as well as using a variety of communication forms at different levels of complexity to make the content more accessible to the learner.

Themes related to the instructional strategies teachers utilized also emerged from the cross-case analysis. The main themes identified were total communication instruction with different levels of representation, communication modeling, positive reinforcement, and a sub-theme of formative assessment. Total communication instruction and positive reinforcement were the most prominent themes as they were observed across all the student participants, where as the sub-themes were only observed across 3 of the 4 participants.

Total communication instruction with different levels of representation can be explained as not only providing students with access to multiple communications forms as a means of expressing and receiving information, but also providing the forms at different levels complexity that range from concrete to abstract. Throughout the investigation this strategy was consistently observed across teachers and students. During their interviews teachers explained how they presented information using multiple representations, and this was also observed as teachers presented information to their students using multiple forms at varying levels representations during their instruction. For example, with Student E, Teacher S would read a vocabulary word while also making reference the associated line drawing and manual sign. Similarly, with Student N, the intervener and Teacher S introduced new vocabulary through an object representation, braille label and manual sign. When working with Student D, Teacher L followed a similar routine by presenting vocabulary by stating the word, showing the student a vocabulary card with the line-drawing, producing the manual sign with the student and also supporting the student to use

his iPad as an AAC device to state the word. Lastly, with Student S, Teacher R presented information using gestures, line-drawings and photographs during the observed read aloud lessons.

The use of total communication with different levels of representation also was observed as teachers supported their student's expressive communication as they consistently provided opportunities for response through multiple communication forms. Similar to the way the information was presented using total communication instruction, teachers would accept student responses through multiple representations. For example, during observations in Teacher S's classroom, the students would expressively produce an approximation of a word, manual sign, as well as activate a voice-output device or use an object representation to answer a question. Student D in Teacher L's classroom would activate a device or be supported to produce a manual sign as an expressive response, while Student S in Teacher R's classroom would respond using a gesture, picture or line-drawing.

Communication modeling was the second major theme that emerged across cases and consisted of teachers modeling communication forms/strategies, focusing on the process of communication and consistently responses to their student's communication attempts. Each teacher in this investigation was observed modeling a variety desired expressive communication responses for their students. For example, Teacher S modeled gestural responses, such as pointing to a line-drawing on the smart board or producing a manual sign for Student E, while for Student N the teacher and intervener modeled manual signs through hand-under-hand production of manual signs or by supporting the student to hand an object representation as a response. Similar strategies of communication modeling

were also seen with Teacher L, as she would first produce a pointed hand gesture to make a selection on the Student D's iPad before asking him to do so, or also hand-under-hand producing manual signs with him. Additionally, Teacher R pointed to cells on Student S's response board or communication device to demonstrate how to respond.

Other strategies that were observed that supported the cross-case theme of communication modeling were the focus Teacher L had on the communication process and how Teacher R consistently responded to his student's communication initiations. As mentioned earlier, when working with Student D, Teacher L consistently focused on the process of communication by supporting the student to perform the necessary steps required to expressively communicate (i.e. produce a pointing hand gesture and reach toward his communication device). Here the focus was less on the answer the student gave, but rather the process of answering. Likewise, Teacher R also consistently responded each time Student S initiated a communication exchange, even if it were off topic and unrelated to the information of the lesson. This strategy helped to reinforce for the student the interactive nature of communication, or rather that when you engage someone in communication they typically respond back. Both the focus on the communication process and consistent responses to communication initiations further support the total communication instruction and development strategies that were observed.

The second major theme that emerged from the cross-case analysis of the instructional strategies was positive reinforcement. Consistently teachers were observed providing positive reinforcement. This was observed in the verbal praise for a correct response or when a desired communicative behavior was elicited such as a gesture, communication initiation or production of a manual sign. This was observed across

teachers and observation sessions. Additionally, Student N and Student S also had token reward systems in place, where their participation earned them a preferred activity following the lesson.

The sub-theme of formative assessment also emerged from the cross-case analysis of instructional strategies. This was observed mainly with Student E and Student S as their teachers assessed were observed asking questions throughout the observations to check for understanding. As Teacher S conducted her small group read aloud lessons with Student E, she continuously paused after each page of the text was read to ask comprehension questions regarding the vocabulary or content of the story. Most often the information from the story would be rephrased into the forms of a question and asked immediately after the information was presented. Likewise, while reading Teacher R intermittently paused to ask Student S comprehension questions about the information that was just read, with the goal of having the student use his AAC device to respond. Additionally, Teacher L supported Student D to answer comprehension questions after each chapter of their adapted text was read; however, the goal of this strategy was to have the student produce a pointing hand gesture and reach for the device to make a selection, rather than to assess for understanding of the content.

The cross-case analysis also yielded themes related to the learning environment, specifically a major theme of adapted materials and a sub-theme of technology. Adapted materials for instruction and response were identified for all of the students during each of the observations. This typically included shortening and simplifying the content of the story being read, incorporating pictures to support comprehension, as well as augmenting key vocabulary with additional representations, such as line-drawings, photographs, real

objects or object symbols. The level of adaptation was related to the student's needs. For example, Student E had line-drawings added to key vocabulary in the text that matched those on her communication device, where as Student N had key vocabulary supplemented with an object representation, braille label and manual sign. Many of the adapted materials observed and recorded in the field notes were also related to the theme of total communication instruction that emerged for each of the cases, where students were provided with multiple communicative forms to support their receptive and expressive communication during instruction.

Finally, the sub-theme of technology also emerged from the cross-case analysis. Technology was used very differently across the observations made during this investigation. Items such as iPads were used as communication devices as well single switch voice-output devices to allow students to voice phrases from the text. Text was presented to the students using smart boards, as well as using a touchscreen laptop, which also served as a response board for comprehensions. Regardless of its use, teachers and students both seemed comfortable using the technology and it appeared to be a regular fixture during the classroom read alouds.

Discussion

The focus of this investigation was to explore teacher beliefs related to communication and literacy development for children with deafblindness, identify the teaching strategies teachers were employing during classroom read alouds, including their utilization of the learning environment. Themes were identified for each of the individual cases, as well as across cases related to teacher beliefs, instructional strategies and learning environment.

Teacher Beliefs

One of the major themes that emerged from this investigation related to the nature of the connection between communication and literacy. Through the interviews, teachers reported that they understood there to be a close relationship between communication and literacy for children with deafblindness, supporting the notions that literacy can be an avenue for communciation development (Downing, 2005b). Their view of literacy was more liberal compared to the traditional perception of simply reading and writing text, and included sharing a variety of communication forms, including manual sign, objects, photographs and line-drawings. This is consistent with the expanded definition of literacy for children with deafblindness presented earlier as the social process of exchanging various representations for communication (Ferrell, Bruce & Luckner, 2014). Additionally, teachers reported that for their students with deafblindness, literacy not only had to include a communicative component, but also be functional and meaningful to the individual. This understanding lends support to the idea that more conventional literacy instruction found in general education may not meet the needs of individuals with deafblindness and thus be less beneficial (Fenlon, McNabb, & Pidlypchak, 2010). Individuals with deafblindness also have the capacity to acquire literacy skills, especially when communication as an integras aspect of the instruction, and it occurs within authentic experiences (McKenzie & Davidson, 2007).

Another significant theme that emerged under teacher beliefs was their comprehensive understanding of deafblindness. Each of the teachers that participated in this investigation held an understanding of the implications of deafblindness and how one's communication development is affected as a result of concommittant vision and

hearing loss. Communication and language are most impacted by the implications of deafblindness and are critical areas of development (Miles & Riggio, 1999; Bruce, 2005). Teachers shared their knowledge on how even with residual vison and hearing, their students had limited access to their surroundings. This is consistent with the belief that one of the major implications of deafblindness is a distorted perception of the immediate environment (van Dijk et al., 2001). Teacher S explained that children with deafblindness have to be intentionally taught what typically developing chilldren learn incidentally from interacting with their environment, affirming that limited access to the environment decreases opportiunities for incidental learning (Bruce, 2002; Miles and Riggio, 1999). For each of the students, communication was a priority area of development and was tailored individually to the student's abilities. This related to the development of communication systems for the students that provided them with alternate means of self-eexpression that was conducive to their level of symbolic understanding (Miles & Riggio, 1999; Bruce, 2005).

Each of the teachers received some formal training in deafblindness. However, Teacher S and Teacher L completed modules from the Open Hands, Open Access program (NCDB, 2016). Coincidentally, these teachers were also the most articulate of the three when they desribed not only their understandings of deafblindness and how it impacts learning and development, but also in their descriptions of the instructional strategies they employed, as well as the accommodations and modifications they put into place to support their students. Moveover, these strategies were also witnessed during the observations within each of their classrooms. This supports the notion that the beliefs that teachers' maintain influence the instructional decisions they make within the classroom (Soto &

Goetz, 1998). Both Teacher S and Teacher L provided very comprehensive and effective program of instruction for their student with deafblindness, thus, supporting the notion that teacher effectiveness is based on the decisions they make regarding content, instructional strategies and the learning environment (Gersten, Walker & Darch, 1988; Rubie-Davies, Flint, & McDonald, 2012).

Instructional Strategies

The main theme that emerged under instructional strategies was the consistent use of total communication with different levels of representations, where teachers provided their students access to multiple receptive and expressive communication forms during their literacy instruction that ranged in complexity. Throughout each of the observations and across teachers, the students in this investigation displayed information using many different communicative representations, while also being provided with multiple options of communication forms to respond with. Providing access to representations at different levels of complexity is consistent with the "Seven Levels of Communicative Competence" that range from unintentional "reactive" communication towards more sophisticated means such as conventional gestures and even the use of abstract symbols (Rowland & Schweigert, 1989; 2000).

Tangible representations as described by Rowland and Schweigert (1989) were included in the variety of representations that the students used during the observed read alouds. The representations varied in level of complexity and distance from its referent object/activity, ranging from concrete objects of reference to more abstract line drawings, depending on the student and the instructional goal of the activity. The incorporation of tangible representations can support the transition from non-symbolic to symbolic

development, which is often an area of struggle for children with deafblindness (Bruce, 2005). Incorporating tangible and meaning representations, such as iconic symbolic concrete representations in Level V (Rowland & Schweigert, 2000), can serve as the basis for a functional communication (Trief, 2007). Using many different representations simultaneously for symbolic representation, as was seen across observations in this investigation with the incorporation of many different communication forms, supports an overall functional communication system (Trief, Bruce, Cascella, & Ivy, 2009). Additionally, using tangible representations or "objects of reference" can further support the child's symbolic development as they learn the connection between the actual object and the label or representation that is used to signify it (Ferrell, Bruce & Luckner, 2014).

The theme of total communication with multiple levels of representation is also consistent with the augmentative and alternative communication approach of providing access to multiple communication forms, where students are provided with a variety of aided and unaided representations to support the process of functional communication (American Speech-Language-Hearing Association, 2002). AAC uses a wide range of representations that can be incorporated into the individual's communication repertoire to support the exchange of information (Romski & Sevcik, 2005). The unaided representations observed were manual sign (Student E and Student N) and gestures (Student D and Student S), and aided forms included line-drawings, photographs and objects. Technology was also used to support the aided representations for most of the students in the form of a communication device that was used to support their expressive communication.

Instructional strategies were also observed that supported communication development during the read aloud lessons. The strategies observed were consistent with those outlined for communication development within the Tri-Focus Framework, including increasing opportunities for communication, sequencing experiences, augmenting vocal input and controlling the environment (Siegel-Causey & Bashinski, 1997). Throughout each of the lessons the students were provided with many opportunities to communicate in different ways, ranging from chances to answer comprehension questions while the text was being read with different levels of support (Student S and Student E), to being supported through hand-under-hand signing to share vocabulary words with a peer tutor (Student N and Student D).

The lessons observed in this investigation were also conducted using a predictable routine. Although implementation of the read aloud lessons differed across teachers, each student's activity was fairly consistent from one observation to another. The establishment of predictable steps within an activity can allow the student not only more opportunities to participate, but also support the development of anticipation (Siegel-Causey & Bashinski, 1997). Increased participation and familiarity with the course of lesson can also increase the likelihood that the student will spontaneously communicate.

Communication development was also observed through augmented verbal input during the lessons (Siegel-Causey & Bashinski, 1997). Teachers reinforced students' expressive communication attempts by verbally acknowledging, clarifying or responding to the message the student shared. Reinforcing the student's message also often provided teachers with an opportunity to provide positive reinforcement to an accurate response, or model an additional communication form. Communication modeling was a prominent

theme that emerged across cases, where teachers would demonstrate to students different ways to express the information, such as by activating a cell on a device, pointing to a representation on a communication board, or porducing a manual sign.

The final strategy from the Tri-focus framework that was salient in this investigation was the communication partner controlling the environment to support natural and functional communication while the learner is alert and responsive (Siegel-Causey & Bashinski, 1997). This strategy was seen in many of the themes identified from instructional strategies and the learning environment across the participants, with teachers accounting for many different factors as they supported their students' communication during read alouds. Consistently, Teacher L and Teacher R ensured optimal access to the learning material for their students by altering the position of the material and well as the individual's positioning in their wheelchair or other support device. Teacher L further supported optimal access by ensuring that Student D was properly wearing his glasses and hearing aides during the lessons, often pausing to reposition or replace them.

The environment was also controlled with the teachers supporting alertness and engagement during their lessons. Teachers ensured that students were visually attending when referencing the material, asking for a response, or modeling a gesture or manual sign. For example, Teacher L would verbally, and at times even physically, prompt her student to look at the material, whereas Teacher R would reposition the student or himself when distractions presented themselves to maintain the student's engagement. These strategies connect with the notion that alertness is a prerequisite for learning and includes interaction and observable engagement (Munde et al., 2009; Munde, Vlaskamp, Ruijssenaars, & Nakken, 2011). Engagement can be identied through specific behaviors the individul is

exhibiting in response to environmental stimuli, such as visually attending to, turning towards or reaching for the stimuli (Kennedy & Haring, 1993; Cuvo, May, & Post, 2001). Moreover, optimal learning conditions can be identified when one takes into consideratiosn the individual's internal conditions, how they are interacting with the environment and the responses they are demonstrating to stimuli within the immediate context (Guess et al., 1993; Guess & Siegel-Causey, 1995).

Positive Reinforcement was another major theme that emerged from the cross-case analysis. Consistently each of the teachers were observed providing reinforcement to correct student responses and attempts. Positive reinforcement is an effective way to encourage in increase in the demonstration of preferred and expected behaviors (Snell & Brown, 2011). In this investigation, positive reinforcement was delivered during read aloud lessons to reinforce the communicative attemps and responses students made during the lessons.

Wait time was a theme related to instructional strategies that was identified in case three. Teacher R would provide the appropriate time to listen to the question and scan the possible options before making a selection. This follows the notion that wait time is critical for a student's cognition, especially for those with motor difficulties, where they have ample time to process the question, formulate a response, and then produce the response (Best, Heller & Bigge, 2005).

The implementation of a consistent scaffolding procedure was a theme that emerged from case 1 where Teacher S was supporting Student E to produce a correct response. The observations were consistent with graduated guidance procedure, where the teachr makes in the moment decisions about the degree of prompting to provide using a

most-to-least system (Best, Heller & Bigge, 2005). Additionally, Teacher S was careful to not provide too much prompting. Accurate responses should be facilitated with the least amount of prompting necessary (Westling, Fox, & Carter, 2015).

Formative assessment was a instructional strategy that emerged as a minor theme in the cross-case analysis. Teacher S and Teacher R consistently were assessing the student's understanding by asking question to guage comprehension while reading. Formative assessments provide ongoing feedback for the teacher to make instructional decisions related to the effectiveness of the strategies they are employing, as well as any necessary adaptations or modifications that need to be made (Best, Heller & Bigge, 2005).

Overall, the read aloud lessons that were observed across the cases in this investigation were highly interactive and engaging for the students. The students were given many opportunities for communication and to interact throughout. For example, Student E and Student S were asked comprehension questions as the text was read, Student N would activate a voice-output device to read a page from the text or ask a question to the group, while Student D also interacted during reading by having to activate his device to advance to the next page. These strategies are consistent with the belief that students should be engaged before, after and during reading, while also beign asked questions and engaged in discussion (Fisher et al., 2004). Additionally, real world connections were made to the material, either by the teacher incorporating actual objects into the reading, making connections between vocabulary in the text with the students daily schedule, or applying the content of the story to real world examples. Applying the ideas from the story into the students personal experiences within and beyond the classroom can support the

construction of knowledge as well as the development of critical thinking skills (Wiseman, 2011).

Learning Environment

Themes related to the learning environment also emerged from the data collected across the three cases. The learning environment can be described as the context where the lesson is taking place, and includes various components, such as the physical space, the student, communication partner and the materials (Bruce, 2002). The data collected from this investigation yielded themes related to the materials and communication partner.

Browder, et al. (2008) explain that to increase engagement in a read aloud, text can be modified in different ways, including altering the physical book, making changes to the content and by incorporating additional materials. Modifications to the texts utilized during the lessons observed were consistent with these suggestions. Often the stories were displayed digitally on a smart board or laptop. The content was abridged so that each page contained 2-3 simple sentences containing key elements related to the plot. Additional supports were also included, such as photographs, line-drawings over key vocabulary, objects related to the story, sound effects and video clips. Incorporating additional items can support individual and group engagement, supporting students to become active participants in the story (Drissel, 1997). Additionally, when actual items from the story are incorporated into the read aloud, as mentioned by Teacher L in her interview and observed with Teacher S, students can become further involved in the telling of the story and also better develop and understanding of he content (Browder, Mims, Spooner, Ahlgrim-Delzell & Lee, 2008).

An additional point of discussion that arose from the theme of adapted materials was the level of complexity of the material. During the observations of Teacher S (with Student E) and Teacher L, the researcher questioned if the material presented was too advanced for the cognitive capacity of the learners. This was apparent because of the increased level of prompting being provided to the students to produce an accurate response. The content of the material used in read alouds for students with significant disabilities should be accommodating to the individual's characteristics, including their physical, sensory and cognitive needs (Browder et al., 2008). Material that is too advanced or cognitively demanding may not support learning or the acquisition of literacy skills.

During a literacy lesson for children with deafblindness, the adult has an important role in the activity as a communication partner, as well as being responsible to manipulate the environment to support and sustain the interaction (Miles, 2005). These changes can support functional and natural communication while ensuring the learner is alert and responsive (Siegel-Causey & Bashinski, 1997). Throughout each of the observations, the teachers and staff were engaged and actively supporting the children in a variety of ways. This included making changes to the positioning of the individual or materials to ensure optimal access/engagement, controlling distracting stimuli and responding to the needs of the child during the activity. Across the activities teachers were observed making changes to ensure the student remained engaged in the activity by either altering the level of support they were providing, changing the method of response, or to the way the information was being presented. These types of ongoing changes are in response to the child's needs and demonstrate an attempt to further sustain the child's engagement and participation in the activity (Janssen et a., 2003b). Moreover, it was clear that each of the

teachers had a very positive rapport with their students, which, as explained by Bruce et al. (2004), in necessary for communication development.

Teachers, and others working with the student in this investigation (peer tutors, intervener) were also very responsive to the child. This was witnessed through consistent responses to a child's communication initiations, supportive interactions, and maintenance of alertness and engagement during instruction. These factors support the concept of harmonious interactions between a child with deafblindness and their communication partner, where the adult is "attune" to the child's communication signals, and responds accordingly to foster their communication development (Janssen, Riksen-Walraven, & van Dijk, 2003a).

In summary, major themes were identified across cases that related to teacher beliefs, instructional strategies and the learning environment. The major theme that emerged for teacher beliefs was that teachers understood there to be a connection between communication and literacy for children with deafblindness. For instructional strategies, the major themes that emerged were total communication with different levels of representation, communication modeling and positive reinforcement. Lastly, the major theme that emerged for the learning environment were the use of adapted materials during the read aloud lessons.

CHAPTER FIVE

CONCLUSIONS AND IMPLICATIONS

The intention of this investigation was to explore teachers' beliefs about literacy and communication for children with deafblindness, while also attempting to gain a better understanding about how they engage their students in read aloud activities to answer the following research questions:

(3) How do teachers use classroom-based read alouds to support communication and literacy development for their students with congenital deafblindness?

   ii. How is the learning environment being utilized during the lesson?

(4) Do teachers' beliefs about communication and literacy development for children with congenital deafblindness influence the instructional approaches and strategies they use during a classroom-based read aloud?

Data for this investigation was collected through observations, field notes and interviews. Each teacher was observed conducting three read aloud lessons and then interviewed on their understandings and beliefs related to communication and literacy development for children with deafblindness. After data was collected, qualitative methodology was used to analyze each case individually for themes to be identified. After individual analysis, a cross-case analysis was conducted to identify themes that emerged across the cases.

Case one consisted of Teacher S, Student E and Student N. Themes that emerged for teacher beliefs for Teacher S were comprehensive understanding of deafblindness, connection between communication and literacy, and practical/functional understanding of literacy. The final theme was unique to Teacher S, as her views of literacy for both Student E and Student N were very practical in the sense that they focused on skills that would be useful in everyday life. Teacher S mentioned that useful literacy skills for her students with deafblindness were reading a schedule, following a recipe or identifying one's name.

For Student E, themes that emerged for instructional strategies were: communication with different levels of representation, formative assessment, consistent scaffolding procedure, connections to the real words and positive reinforcement. Also for Student E, themes related to the learning environment emerged and were: adapted materials, technology, peer tutor, and minimization of distractions. Meanwhile, for Student N themes also emerged. For instructional strategies, themes were: total communication with different levels of representations, communication modeling, pre-teaching vocabulary, generalizing concepts across settings, and positive reinforcement. Additionally, themes that emerged related to the learning environment were: adapted materials, intervener, peer tutor and environmental labels.

Case two included Teacher L and Student D. Themes that emerged for instructional strategies were: comprehensive understanding of deafblindness, connection between communication and literacy, and practical/functional understanding of literacy. The last theme for teacher beliefs is also a unique theme for Teacher L, as she understood literacy to be functional because for her student with deafblindness it meant his understanding information that is presented to him. For the instructional strategies in case two the themes

were: total communication with different levels of representation, focus on communication process, errorless learning and prompting, attention to material, consistent lesson plan implementation, positive reinforcement, and focus on the use of eyeglasses and hearing aides. Also, for the learning environment themes emerged for adapted materials, technology, and proximity of materials.

Lastly, Case three involved Teacher R and Student S. Under instructional strategies themes that emerged were a focus on receptive and expressive communication, connection between communication and literacy, and communication and literacy as a developmental process. Meanwhile, for the instructional practices from the case, the following themes emerged: total communication with different levels of representations; response to communication initiations; formative assessment; wait time; and positive reinforcement. Finally, themes that emerged for the learning environment were positioning, proximity of materials, and supporting attention.

Major and minor themes also emerged when a cross-case analysis was conducted. Major themes were identified across all cases, where minor themes were only seen for two for the three cases. For teacher beliefs, the major theme that emerged was connection between communication and literacy, while the minor theme was a comprehensive understanding of deafblindness. Related to instructional strategies, the major themes that emerged were total communication with different levels of representation, communication modeling and positive reinforcement, with the minor theme of formative assessment. Lastly, for the learning environment a major theme of adapted materials emerged, with a minor theme of technology.

Implications for Practice

The results of this investigation suggest five overall implications for practice related to the key areas of study: teacher beliefs, instructional practices and the learning environment. The first implication relates to teacher beliefs, more specifically how the results of this investigation imply that teachers understand there to be a relationship between communication and literacy for children with deafblindness. Communication is a vital area of development for these children and literacy can serve as a forum to teach vital communication skills that can support communication beyond the immediate, allowing individuals increased access to environments, communication partners, and activities (Downing, 2005b). By not understanding the connection between communication and literacy, teachers may miss out on key opportunities to engage their students with deafblindness in meaningful and engaging literacy activities that can add to their overall development. During their interviews teachers all reported a relationship between communication and literacy for their students with deafblindness. They shared how the variety of representations that students use for communication were also related to literacy activities, such as read aloud activities. Also, as observed in class, teachers were integrating communication skill development into their read aloud lessons as they modeled communication forms for their students, incorporated a variety of representations at different levels of complexity into the activity, and presented the students with many opportunities to answer questions.

In order to support this implication, teachers must be fluent in a variety of communication forms when working with students with deafblindness. This connects to pre-service and in-service training. As noted from this investigation, the teachers who had

completed the Open Hands, Open Access training (NCDB, 2016) shared more information about the way they provided multiple communication forms to their students with deafblindness and also were observed providing instruction that appeared to be more conducive for skill acquisition when compared to the teacher who did not complete training specific to supporting individuals with deafblindness. Overall, the instruction observed from the teachers who had completed specialized training in deafblindness appeared to be at an appropriate level considering the cognition, level of communication and sensory channels of their students.

The second implication for practice is also related to teacher beliefs and emphasizes an expanded definition of literacy for children with deafblindness. Within this investigation, teachers all shared that they not only understood a connection between communication and literacy, but also that they saw literacy as the exchange of various representations at different levels of complexity to share information with another individual. The teachers saw communication and literacy to be interrelated and interactive for their students with deafblindness. Their views of literacy extended beyond the traditional notion of reading and writing toward a more functional approach to literacy as a social process of exchanging various representations for communication (Ferrell, Bruce & Luckner, 2014). Children with deafblindness can experience short and long term benefits to their quality of life when provided opportunities to interact over and gain meaning from text (Browder et al., 2009). The conventional literacy instruction may not be appropriate for children with deafblindness because of multiple factors that impact their learning and development (Fenlon, McNabb & Pidlypchak, 2010). When understood as exchanging information in a variety of ways based on personal experiences, literacy has inherent

communicative and social components (Bruce et al, 2004). In order to provide meaningful and engaging read alouds to students with deafblindness that support their communication development, teachers need to adopt a broader understanding of literacy that extends beyond academic reading and writing text.

The third implication for practice from this investigation is related to instructional strategies. Read alouds for children with deafblindness should consist of a balance between systematic and child-directed instruction. Many aspects of systematic instruction were consistently observed throughout the lessons, including formative assessment, prompting, errorless learning, wait time and positive reinforcement. Formative assessment was observed with Teacher S and Teacher R as they asked questions to gauge their student's learning during instruction. Prompting and scaffolding were also observed as students were supported to produce the correct response, with Teacher L using errorless learning to support her student to be more successful with his responses. Wait time was also an aspect of systematic instruction that was observed with Teacher R, as he would pause after asking a question to allow his student to process the information, also allowing the student to formulate and produce his response. Positive reinforcement was not only observed across participants, but also a major theme that emerged where students were praised to reinforce correct responses.

Child-guided instruction was apparent through the emergence of the theme of total communication with different levels of representation. This theme takes into consideration the child's individual characteristics to support their receptive and expressive communication by providing options of multiple communicative forms at different levels of complexity. This was a major theme that was observed across participants and

observations, with teachers providing multiple communicative options to their students. For example, a word may be verbally stated and also accompanied by a manual sign and a line-drawing all indicating the same word or concept. This connects to the concept of AAC, where a wide range of representations are incorporated into the individual's communication repertoire to support the exchange of information (Romski & Sevcik, 2005).

Child-guided was also seen with the student's expressive communication. In many instances, the teacher used total communication to present information or a question, and the child was able to select the communication form that they were going to use in response to their communication partner. For example, Teacher S would explain a vocabulary word during a read aloud lesson by saying the word, pointing to the line-drawing on the smart board, and by producing the manual sign. When Student E was asked to repeat the word, she was not only able to use any of the demonstrated forms, but also others, such as by indicating the word on her iPad. In this example, Student E had control over the communication form she used for her response, and could change her communicative form for respond from question to question.

The fourth and fifth implications for practice are related to the learning environment. The learning environment extends beyond the physical space to include the materials being used during instruction and the communication partner (Bruce, 2002). Modifying the physical book used in a read aloud by physically altering the book, changing the content and incorporating additional materials, such as objects related to the story, can support engagement and comprehension (Browder et al., 2008). Adapted materials were a major theme that emerged from this investigation. Modifications to the

text observed included incorporating objects, supplementing key vocabulary with other representations, and using technology to display the information. Additional supports also included the addition of sound effects and voice-output devices to support student engagement. When text without adaptation or modification was used, as seen with the initial two observations for case three, the student appeared to be participating in a manner that did not appear to be meaningful nor as engaging as when adapted materials were used. Materials should be adapted to accommodate the student's level of comprehension, level of communication, and preferred sensory channels, with attention being paid to the complexity of the representations being used expressively and receptively.

The final implication relates to the communication partner. Children with deafblindness should have access to a communication partner that is responsive, supportive and attuned to the child's communicative repertoire (Janssen et al., 2003b). By modifying the environment accordingly, the communication partner can not only support the child to initiate communicative interactions, but also sustain the interaction and the child's active participation (Siegel-Causey & Bashinski, 1997). The communication partners in this investigation played a salient role. Not only did the partners support the students by providing accommodations and modifications during the activity, they also responded to communication attempts, redirected the student's attention back to the material when distracted, and ensured the student was wearing their hearing aides and glasses before proceeding with instruction. Additionally, the communication partner was attuned to the child's needs, making changes to the environment, such as with material placement and student positioning, to ensure that the child not only had optimal access to the material, but also that distractions were minimized.

Implications for Future Research

Very little research exists on literacy for children with significant disabilities (Baker et al., 2010), including children who are deafblind. Thus, the total benefits of engagement with meaningful literacy activities that support communication development for children with deafblindness have yet to be fully discovered. Therefore, more empirical investigations on effective literacy skill development practices for this population of student is essential in order to add to the knowledge base.

Additionally, to support the broadening of the definition of literacy for children with deafblindness, another area in need of study is the communicative underpinnings of literacy as it relates to children at a pre- or early symbolic level of representation. Attention here should focus on how a variety of communication forms that range in complexity are being used to not only express the information, but also that are available to the student to express information.

Because children with deafblindness are such a heterogeneous group of individuals, the current research in the field must continue to be replicated in order for best practices to be developed and implemented in schools. Having a research-based set of practices will help to support better teaching in our schools and exponentially provide better outcomes for children with deafblindness worldwide. To obtain a larger sample size that is more reflective of the larger population of individuals with deafblindness, quantitative research could be used for a large-scale survey design, where many teachers across a much larger area could be asked about their beliefs about communication and literacy for children with deafblindness, as well as explain the ways in which they use read alouds with their students. A mixed-methods design is also an option to access a broader population of

teachers working with students with deafblindness, especially with collecting survey data as well as observational data on the unique ways teachers are supporting their students to access text.

Limitations

The greatest limitation to this investigation is the generalizability of its findings due to the small sample size. Because the research only included 3 teachers and 4 students, the findings may not be generalizable to other individuals who are deafblind. Because the implications of deafblindness are far greater than simply combining the effects of the individual's vision loss with the effects of their hearing loss, and this population often have other disabilities that affect their cognitive functioning, communication and activities of daily living, this population is very heterogeneous. Thus, generalizability is also not possible because of the heterogeneity of the population of children with deafblindness.

Additionally, because only three lessons were observed per case, the data collected may not be reflective of typical classroom performance. Increasing the number of observations in this investigation may allow for a more comprehensive understanding of the variety of ways teachers are using read alouds with their students with deafblindness, as well as the different texts they are supporting their students to access. Having additional observations would also increase the potential for more themes to emerge related to teacher beliefs, instructional strategies and the learning environment.

The final limitation is related the training teachers received in deafblindness. Because Teacher S and Teacher L both went through the Open Hands, Open Access training (NCDB, 2016) provided by the National Center on Deaf-blindness, they may not be a reflective sample of teachers working with students with deafblindness. Teachers

having only received minimal information on the implications of deafblindness through their credential programs, as seen with Teacher R, may in fact be more reflective of the greater population of teachers working with this population.

Conclusion

This study investigated how teachers were conducting real alouds for children with deafblindness and the beliefs their teacher's had related to the relationship between communication and literacy for individuals with deafblindness. Qualitative methodology was used to support the emergence of major themes in the areas of teacher beliefs, instructional practices and the learning environment. The major theme for teacher beliefs was related to a shared understanding of a connection between communication and literacy for children with deafblindness, and the minor theme was comprehensive understanding of deafblindness. Major themes that were identified for instructional strategies were: total communication with different levels of representation, communication modeling, and positive reinforcement, as well as the minor theme of formative assessment. Finally, for the learning environment, a major theme of adapted materials emerged, as well as a minor theme of technology.

It is critical that teachers appropriately and meaningfully engage their students with deafblindness in read alouds that support their communication development. For this to happen, teachers must understand the nature of literacy for children with deafblindness, as well as understand how concomitant vision and hearing losses impact the individual's cognition, communication and activities of daily living. Teachers also must be fluent using multiple communicative representations that range in complexity so that they can model and teach their students to share information with others in a variety of ways. Children

with deafblindness should be granted the opportunity to meaningfully access books and receive the numerous quality of life benefits literacy can offer.

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APPENDICIES

Appendix A
Interview Protocol

Implementation Procedure: The interview will be recorded and then transcribed by the researcher.

Hello. My name is Chris Brum. First off, I want to thank you for your time in helping me to better understand literacy for children with deafblindness. I have some questions for you about your work with students with deafblindness.

(1) Would you describe for me the training and experience you have related to children with deafblindness? For example, courses in your credential program, in-services, etc.

(2) Can you share with me your understanding about communication development as it relates to children with deafblindness?

(3) Can you describe for me the training you have had in the area of literacy?\

(4) How would you describe literacy development for children who are deafblind?

(5) To you believe there to be a relationship between communication and literacy for children who are deafblind?

(6) Let's talk about the lessons I observed. Can you describe the instructional goals of the read aloud lessons as they relate to your student with deafblindness?

- What about the teaching strategies you used for that student?
- How about the materials that were used? Can you describe any specific adaptation and/or modifications that were made with that student in mind?