COMMUNICATION INTERVENTION FOR CHILDREN WHO ARE CONGENITALLY DEAFBLIND: THE INFLUENCE OF AN INSERVICE WITH FOLLOW-UP APPROACH ON TEACHER THINKING AND PRACTICE

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ABSTRACT

COMMUNICATION INTERVENTION FOR CHILDREN WHO ARE CONGENITALLY DEAFBLIND: THE INFLUENCE OF AN INSERVICE WITH FOLLOW-UP APPROACH ON TECHER THINKING AND PRACTICE

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This study investigated the thinking and practices of two teachers regarding communication intervention for learners who are congenitally deafblind, prior to and following an in-service series with collaborative follow-up supports. Identified best practices in communication intervention for children who are deafblind formed the theoretical basis for the in-service, which was organized using the structure of an expanded conceptualization of the four aspects of communication: form, function, content, and context. The approach to delivering the communication intervention model was an in-service series with collaborative follow-up supports based on theories of teacher learning, the process of change and effective staff development approaches.

This case study of two teachers employed a modified analytic design to analyze data from the following methodologies: structured interviews, passive and active participant observations, stimulated recall, and written documents. In addition, Hall, Wallace, and Dossett's (1973) "Stages of Concern About the Innovation" were applied to the analysis of teachers' use of the in-service and follow-up materials and strategies.

This study demonstrated that both teachers chose a point of entry to the communication intervention model that was connected to their individual knowledge base. While the first teacher concentrated her thinking and implementation efforts on form and context, the second teacher integrated all four aspects of the model. This teacher's ability to integrate the aspects of the model may have been connected to her

access to an established learning community. Activity and routine, a component of the aspect of context, became a central concern to both teachers. Both teachers reached the stage of "refocusing" as described by Hall et al. (1973). Modeling, on site feedback, video review, stimulated recall, team discussions, and researcher support to the identification of practices applicable to individual children, supported teacher implementation.

DEDICATION

This dissertation is dedicated to John Barnett Bruce, my best friend.

ACKNOWLEDGMENTS

As I reflect upon the doctoral program I am about to complete and the dissertation experience, I am especially struck by the enormity of the changes that have occurred in the past six years of study. When I began this journey, my children Doug, Kevin, Mickie, and Matthew were 18, 15, 13, and 1 prospectively. The two oldest left home to study, work, and assume adult roles. My daughter underwent a surgery that resulted in mental illness and a difficult course of treatment and rehabilitation. I have often thought how different life has been for my youngest, who had the influence of two siblings and a mother, all studying at universities. As the defense neared, I became increasingly aware of just how proud my children were of my work. I thank my children for their continued support.

The next note of thanks goes to my parents who taught me the value of working hard. I was taught as a young child to work first and play later. That lesson was crucial to the completion of the dissertation. I am also thankful for the continued support of my parents in my adult life. Countless times my parents communicated to me that they were proud of me and what I was working toward. That meant a great deal to me, especially at times when I questioned the value of continuing with academic goals in the light of personal challenges. A special thank you goes to my sister, Mary Jo, who is the best listener I have ever known. Her support was always but a phone call away.

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CHAPTER ONE

INTRODUCTION

Rationale for the Study

The development of communication is often cited as one of the most critical challenges faced by learners who are congenitally deafblind (Sauerburger, 1993; Siegel-Causey & Ernst, 1989). Without either distance sense intact, opportunities to learn through visual and auditory observation are extremely limited. Few opportunities exist to observe communication that is accessible to hearing and sighted children. Children who are congenitally deafblind will not acquire communication competencies incidentally. Nor will they acquire such competencies by the mere provision of an interpreter. The child who is deafblind must be deliberately taught what hearing and sighted children learn without effort (Huebner, Prickett, Welch & Joffee, 1995). They are dependent on the teacher's and caregivers' ability to systematically plan and implement communication intervention strategies. Without such intensive communication intervention, children who are congenitally deafblind cannot reach their full potential.

The systematic planning and implementation of communication interventions is critical to the development of the child who is congenitally deafblind. The population of children who are deafblind is heterogeneous, with over 90% of the children having residual hearing or vision that can be developed to enhance learning and communication (Fredericks & Baldwin, 1987). Educational intervention is compounded by the heterogeneity of the population and the lack of trained teachers. The population of identified deafblind children has doubled in the past ten years to a total of 10,415 children in the United States (Baldwin, 1995), with an estimated 6% receiving the consultation services of a teacher who is either university or agency trained in deafblindness (McLetchie, 1995). In addition to the lack of prepared teachers, there is concern over the paucity of research-based interventions in the field of deafblindness. The recognition of

communication as the primary obstacle faced by learners who are congenitally deafblind, coupled with the scarcity of prepared teachers and the lack of research based interventions, creates the need for a comprehensive communication intervention model that synthesizes the best instructional practices in communication intervention from the field of deafblindness. Given the scarcity of fully prepared teachers in deafblindness, there is a critical need for an effective and efficient approach to the delivery of training at the in-service level. Such training would incorporate best practices in communication intervention and be delivered to teachers via an approach that incorporated best practices in professional development. This necessitates an understanding about what causes teachers to change their thinking and practices.

Theoretical Framework

Several literatures formulated the theoretical basis for this study. The literature on best practices in communication intervention for children who are deafblind, specifically the segment of that literature associated with children communicating at an intentional presymbolic to early symbolic level, was synthesized and organized within the structure of the four aspects of communication as described by Stremel-Campbell & Matthews (1998) and expanded by the researcher. The four aspects are: form, function, content, and context. This structure has become part of the shared language of persons knowledgeable in the field of deafblindness, yet it has not been developed into either a pre-in-service or in-service teacher preparation model. Although elements of this model were being used in technical assistance, offered through the state deafblind projects, no systematic examination of teachers' thinking or practices had occurred (Personal Communication, D-B Link: The National Information Clearinghouse on Children who are Deafblind, 1996). This study took the common understanding of the four aspects and shaped it into a non-linear structure to depict the interactive nature of the aspects of

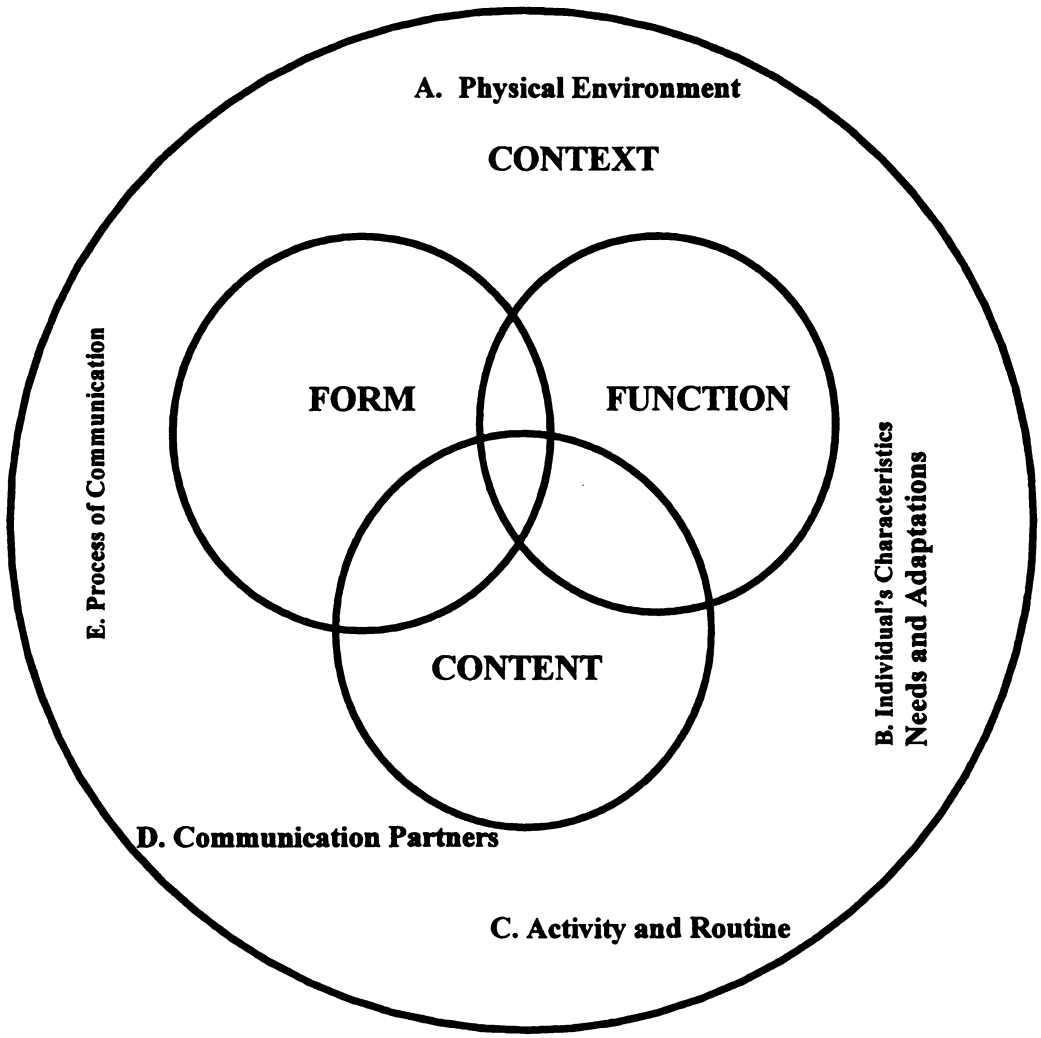
communication. A specific component of the aspect of context, the process of communication, has also been added to the conceptualization.

The literatures on teachers and the process of change in thinking and practice and effective staff development were integrated into the development of an approach to the delivery of the expanded conceptualization of the Four Aspects of Communication intervention model. While the intervention planned for this study focused on a narrow segment of the population of deafblind children (intentional, presymbolic to early symbolic communicators), the model is relevant to the broader population of deafblind children and may be relevant to learners with other disabilities. The forms of communication and some of the strategies would change to accommodate the child's communication level and need for intervention.

Best Practices in Communication Intervention

In this expanded version of the Four Aspects of Communication, context sets the stage within which form, function and content occur (Figure #1). The aspect of form addresses the child's expressive and receptive methods of communication. All people use a variety of communication forms. Children at the presymbolic to early symbolic level of communication are likely to use body language, objects, partial objects, textures, gesture, pictures, vocalization and 1-2 word verbalizations or sign language messages. The criteria for the selection of a form for expression includes consideration of the following factors: child's vision, hearing, current amplification of hearing, visual accommodations, current forms of communication, physical needs, cognitive functioning, and the context of the communication. It is also suggested that a form be selected for expression only if the child currently responds to that form (Rowland & Stremel-Campbell, 1987).

FOUR ASPECTS of COMMUNICATION



It is critical that the form used by the child for expression is recognizable to communication partners (Rowland & Schweigert, 1993). Communication partners need to express in the child's preferred form in order to provide the child with modeling. This often requires instruction in the child's preferred form of communication (Mar & Sal, 1995).

Function is the purpose for the communication. This study focused on eleven early functions that are the likely purposes of communication for persons communicating at a presymbolic to early symbolic level of communication. The eleven functions are: protesting, calling, showing objects, giving objects, answering, labeling, requesting objects, requesting actions, commenting on objects, and commenting on actions (Cirrin & Rowland, 1985; Dore, 1974; Stremel-Campbell & Matthews, 1988; Waterson & Snow, 1978).

The acquisition of early functions is affected by deafblindness. For example, the ability to acquire the function of greeting for expression is dependent on knowing that opportunities to greet exist. The absence of hearing and vision interferes with the individual's ability to recognize that potential communication partners are in physical proximity. Adults, responsible for the planning of communication interventions, need to create opportunities for children to express the early functions of communication. They must also model the use of the early functions. Although Nicholas, Geers, and Kozak (1994) found that the acquisition of early functions for deaf children was similar to that of hearing children, it is possible that there is a unique developmental pattern for congenitally deafblind children.

The third aspect of communication is content which is the message itself. Expressive messages are driven by context, especially the activity in which the child is participating. The child's interests and motivation should largely determine the vocabulary of focus. Ecological inventories can support the identification of expressive content that would be important to full participation in the environments that the child

frequents (Bottorf & DePape, 1982; Murray-Branch, & Bailey 1991). In addition, Calculator (1988) suggested that the child must be taught to generalize messages to various environments.

The fourth aspect of communication, context, creates the stage within which communication occurs. In the expanded conceptualization of the four aspects, used in this study, elements of context were organized within the following five components: (1) the physical environment; (2) the individual's characteristics; (3) activities and routines; (4) the communication partners; and (5) the process of communication. The physical environment was defined to include the physical layout, visual, auditory features, and level of stimulation in the classroom. The level of stimulation is one important consideration within the component of physical environment. The category of individual characteristics was defined to include the child's need for adaptive and augmentative equipment, including glasses, hearing aids and equipment to address motoric needs. This conceptualization was expanded during the study to include additional learner characteristics. Activities and routine are important to communication intervention because the activity largely determines what would constitute a sensible message. A child's knowledge of the daily routine creates opportunities for conversation as the child anticipates the next activity.

Children who are congenitally deafblind and functioning at the presymbolic to early symbolic level of communication are dependent on communication partners to recognize their communicative attempts and to reinforce such efforts (Calculator, 1988; Siegel-Causey & Downing, 1987). They also need communication partners who can create opportunities for them throughout the day. Adults who create opportunities for communication apply a variety of strategies, such as: reducing teacher directives (Rowland & Stremel-Campbell, 1987), creating a need to communicate, offering choices (Brown & Lehr, 1993; Downing & Siegel-Causey, 1988), and facilitating peer interaction.

The aspect of context is fluid, in a state of continual change. The communication partners, their needs, the stages of the activity and even subtle changes within the physical environment will all influence the immediate context. The interpersonal context is established and altered by both the child and her communication partners.

The communication intervention model, Four Aspects of Communication, represents a synthesis of the literature on best communication intervention practices for children who are congenitally deafblind, while depicting how the four aspects influence each other simultaneously. An approach to the delivery of the communication intervention model was based on an integration of the literatures on teachers and the process of change and effective staff development.

Teachers and the Process of Change

The literature on teachers and the process of change was relevant to consideration of how best to present the communication model to teachers in a manner that would be relatively efficient given the severe shortage of teachers prepared in the area of deafblindness. Fullan (1991) asserted that teachers must first have the desire to make a change in practice. Without this desire, an innovation is unlikely to have a strong impact. Teacher concerns about the innovation will influence implementation (Loucks-Horsely & Stiegelbauer, 1991). A wide variety of factors have been found to interfere with teacher implementation, including lack of time, lack of resources, abstract or unclear innovations, teacher isolation, teacher beliefs, and lack of administrative support (Englert, et al, 1993). Teachers judge the worthiness of an innovation by how immediately "useful" it is given the context of the teacher's current instructional assignment (Doyle and Ponder, 1977). The impact of the innovation on student learning is of the utmost importance to teachers (Englert et al., 1993; Englert & Tarrant, 1995; Fullan, 1991; Guskey, 1986; McLaughlin, 1990). This is particularly noteworthy for consultants supporting teachers who work with children who have disabilities that may result in a slower learning rate.

Effective Staff Development

There has been a shift away from viewing teachers as recipients of knowledge to teachers as creators of knowledge. Effective staff development programs are founded on the need to recognize teacher priorities and concerns. In a review of more than two hundred research studies, Joyce and Showers (1980) found that the following characteristics were present in effective staff development programs: presentation of theory, modeling or skill demonstration, practice that was either simulated or in the classroom, and coaching. Although in-services offered in one session without follow-up were largely ineffective (Elmore, Peterson, & McCarthey, 1996; Shumm & Vaughn, 1995; Sparks, 1983), in-services employing the presentation of theory, modeling, opportunities to practice, structured feedback and coaching were significantly more effective (Joyce & Showers, 1990). Follow-up supports, such as structured feedback, guided reflection, and coaching were critical to the teacher's opportunity to practice the new skills and to the ability to implement new ideas in the classroom. Opportunities to discuss the innovation with teachers within the school learning community have been found to support implementation (Englert et al., 1993; Shumm & Vaughn, 1995).

Purpose of the Study

Communication intervention is often cited as one of the areas of greatest educational concern for learners who are congenitally deafblind (Huebner, Prickett, Welch, & Joffee, 1995; Siegel-Causey & Ernst, 1989). Given the few teachers prepared in the area of deafblindness, there is a need for a communication intervention model that can be useful to practicing teachers prepared in a different disability area. This study examined how two teachers think about and practice communication intervention with children who are congenitally deafblind and communicating at an intentional, presymbolic to early symbolic level. This study employed the use of a communication intervention model that encompassed best communication intervention practices in the

field of deafblindness, yet was accessible to teachers working with children who are deafblind, who had no university preparation in deafblindness. The approach to delivery of the model embedded the literatures on teacher change and best practices in staff development within the confines of the need for an efficient approach. Additionally, teachers' ideas and concerns about the model were an integral part of the study. Hall, Wallace, & Dossett's (1973) "Stages of Concern about the Innovation" provided the theoretical basis for the consideration of teacher's concerns about the intervention model. This study examined teachers' thinking and implementation of instructional strategies, while incorporating this information into a reformation of theory intended to support the communication development of learners who are congenitally deafblind. The purpose of the study was to examine the usefulness of the communication intervention model, Four Aspects of Communication, to teacher thinking and practice.

Research Questions

The following research questions guided the study: What are teachers' communication intervention models and practices for children who are congenitally deafblind? How will teachers' communication intervention models and practices change as a result of an in-service with collaborative follow-up approach, based on the four aspects of communication: form, function, content, and context? What additional supports do teachers need to integrate the four aspects of communication into daily practice? The first question focused on teacher thinking and practice prior to the in-service and provision of follow-up supports, while the last two questions examined changes and needed supports, following the interventions.

Methods

This study integrated the literatures in communication intervention, the process of teacher change, and effective staff development to develop an in-service and collaborative

follow-up approach to the delivery of a teacher in-service preparation model in communication intervention. Teacher interviews and observations were the primary methods employed in the case studies of two teachers. The individualized, developmental nature of teacher change was examined through the development of follow-up documentation materials and through qualitative data analysis using the modified analytic induction design (Ambert, 1995).

The following five data sources informed the study: transcripts of interviews, transcripts of videotaped observations, transcripts of audiotaped stimulated recall sessions, written action plans, and researcher field notes. Two interviews were performed, one before the in-service and one after the study was completed. Four two-hour observations were videotaped, one observation period occurred before the in-service and three followed the in-service sessions. The researcher provided an opportunity for guided reflection during stimulated recall sessions (Clark & Peterson, 1986). The teacher and the researcher each selected a ten-minute segment from the observation videotapes to be used in these sessions. Written Action Plans consisted of three parts. The purpose of Part I was to differentiate teacher thinking from changes in teacher practice. Part II provided teachers with a space within which to record their concerns about the innovation and Part III provided teachers with an opportunity to request follow-up supports. Researcher field notes were used to capture teacher discussion or environmental features that could not be captured on tape.

The methods and corresponding data sources were selected to unveil aspects of either teacher thinking or teacher practice or the integration of the two. This combination of methods was used to support validity and to support the examination of possible differences between how teachers think about and how they practice communication intervention with children who are congenitally deafblind. After coding and analysis, using the Modified Analytic Induction design, the data was organized within the structure

of the research questions and examined for when a source provided evidence that was supported by additional data sources and for when a source revealed unique information.

Definitions

Congenital deafblindness: Born with the combination of hearing and vision loss. This does not connote the total absence of hearing or vision.

In-service: A formal presentation provided to practicing professionals.

Communication: "Exchange of a message between two or more people" (Goodall & Everson, 1995; Mississippi Deaf-Blind Services for Individuals who are Deafblind, p. 1).

Symbol: Something that stands for or represents something else (Huebner, etal 1995).

Referent: The person, place, or thing that is represented by the symbol.

Preintentional communication: Communication that is not intentional. People communicating at preintentional level do not understand that their communication can have an impact on others. (Huebner, et al., 1995).

Intentional communication: "Behavior used to transmit a purposeful message to another person (Downing, 1990, p. 11)."

Nonsymbolic communication: "What distinguished nonsymbolic from true symbolic communication is the dependence on referents that exist in the same time and space as the communicator (Downing & Siegel-Causey, 1988, p. 339)." Nonsymbolic communication forms are usually less formal and highly individualized (Goodall & Everson, 1995).

Presymbolic communication: The meaning is similar to nonsymbolic. The terms are often used interchangeably although there may be the connotation that persons who are communicating at a presymbolic level will eventually achieve a symbolic level of communication.

Early symbolic: A state or stage of communication in which the child is beginning to use symbols, separated in time and space, from the referent. For the purposes of this study, early symbolic communication will not exceed one to two word expressions.

Symbolic communication: "Symbolic communication refers to any formally organized rule governed system of words, signs or objects (Goodall & Everson, 1995, p. 204).

Four Aspects of Communication: The four aspects of communication are form, function, content, and context.

Form of communication: The form is the method or mode of communication. Examples include sign language, gestures, whole objects, body language, and facial expressions.

Function of communication: The function is the purpose of the communication message. In the example, "I want a cookie," the function of the communication is to request an object.

Content of communication: Content is the actual message of the communication. In the example, "I want a cookie," the content is the actual message, "I want a cookie."

Context of communication: Context sets the stage for communication and includes the following four elements: (1) the physical environment; (2) the individual's needs and adaptations; (3) the activity; (4) the communication partners, including adults and peers; and (5) process of communication.

CHAPTER TWO

LITERATURE REVIEW

Chapter Two describes the theoretical basis for both the communication intervention model and the in-service with collaborative follow-up approach used to deliver the model to teachers. A review of current literature on best practices in communication intervention for children who are congenitally deafblind, teachers and the process of change and effective staff development are presented.

Best Practices in Communication Intervention

A communication intervention model for children who are congenitally deafblind must be predicated on the understanding of how deafblindness affects communication development. Children who are born deafblind do not have either distance sense intact. It is the distance senses that invite us to explore beyond our own bodies. Infants and young children hear or see something of interest and are drawn to explore. Children who are congenitally deafblind are not invited in; they lack the motivation to explore. The effect of congenital deafblindness on communication development is greater than the effects of hearing loss on the deaf child or the effects of vision loss on the blind child, or even the sum of these losses. The effect is multiplicative as both distance senses are affected (McInnes & Treffry, 1982), depriving the child of much incidental learning and of an understanding of the world beyond himself that is gained through visual and auditory observation. The child who is congenitally deafblind is dependent on adults to create in him a motivation to explore beyond his own body. It is through such exploration, coupled with communication in the child's preferred communication forms, that the child will develop the conceptual basis for communication

Van Dijk (1967) developed interventions for what he termed the "nonverbal" deafblind child. His work focused on the need to understand the child's struggle to reach an understanding of symbolism. As such, much of the interaction between teacher and child was founded in motor activity and concrete representations. Van Dijk recognized early motor interactions as a conversation of sorts and emphasized that teachers must learn to have conversations at the child's present level of communicative functioning. He established that the goal of communication intervention with children who are deafblind was to "bring the person to conversation" (Hagood, 1994). This method is different from functional communication training that focuses on the child's ability to express discrete messages in very specific situations. Conversation is a dialogue requiring turntaking around a common topic of interest (Hagood, p. 5). At the presymbolic or early symbolic levels of communication, conversation most often begins with the child and may involve the use of a variety of communication forms. The adult responds to the child's lead, in terms of the activity of interest, the child's readiness to interact, and by communicating in the child's preferred forms. Effective conversation with children at this level of communication development requires responsive, consistent adults who are able to converse in a range of communication forms, including concrete forms such as body language. The adult must create a positive climate for conversation and serve as a model for the child (Hagood).

The four major components of any communication system are form, function, content, and context (Stremel-Campbell & Matthews, 1988, p. 165). Form is the method of communication. Function is the reason or purpose for the communication. Examples of function include protest and request. Content is the specific message of the communication. Context includes the environmental features present at the time of the communication. The four aspects interact and influence each other. For example, a particular activity, an element of context, will influence the content expressed by communication partners. The messages that are likely to be communicated in the context

of the activity of assembling a wicker basket, are vastly different from the likely emergent messages or content that could result during swimming instruction.

Forms of Communication

All people use a variety of forms or methods to communicate (Downing & Siegel-Causey, 1988). Children who are congenitally deafblind, at the intentional presymbolic to early symbolic level of communication, are likely to express themselves through the following forms: body language, objects, partial objects, textures, gesture, pictures, vocalization, and one or two word utterances expressed in verbalization or manual sign. They also require adults and peers who are able to communicate in these preferred forms, thus providing receptive communication experiences that support the development of expressive communication.

At the presymbolic level of communication, the child must be in the presence of the referent, or thing about which the communication is focused, in order to communicate. Intentional communication occurs prior to symbolic communication (Stremel-Campbell & Matthews, 1988). Children who communicate at an intentional, presymbolic level intend to have an impact on the receiver, but have difficulties in separating in time and space from the referent they are communicating about. As the child develops toward symbolic language, individual words, signs, and gestures, textures will be used to express specific functions and the child will be able to use symbols in the absence of the referent (Stremel-Campbell & Matthews). Imitation, tool use, play skills, and presymbolic behaviors are connected to the child's development of the use of symbolic communication. Thus intervention must include a focus on increasing the child's use of presymbolic communication forms, while increasing the child's vocabulary and number of communication partners. The communication partners will play an important role in shaping the child's communication behaviors (Siegel-Causey & Downing, 1987).

Each child will require support in the use of communication forms that are appropriate to his/her individual level of development, including the child's current communication level. Therefore, children within the same classroom will likely use different expressive and receptive communication forms. Rowland and Schweigert (1990) presented a diagram depicting forms of communication, from the more concrete to the more abstract. The information contained in their manual and videotape can support teachers and caregivers in understanding the requirements of various forms of communication.

Communication is only functional if it is interpretable to others and has the potential to influence the behaviors of others (Rowland & Schweigert, 1993). Some forms may be more interpretable than others. The deafblind child's forms of communication may require us to teach potential communication partners new forms of communication, such as the use of objects, touch cues and signs (Mar & Sal, 1995). Communication partners must be able to not only recognize the child's communicative attempts, but must also be able to communicate in the child's preferred communication forms.

Body language. Children who are congenitally deafblind will communicate through their body language for an extended period of time. The child's physical behaviors are communicative (Rowland, 1989). Children communicating at this level require sensitive adults who are able to recognize and respond to such nonverbal forms. The adult communication partner must be able to interpret the meaning or possible meanings of the individual's behavior (Goodall & Everson, 1995; Siegel-Causey, 1989; van Dijk, 1986). Communication partners must also be able to communicate in the child's forms. The use of touch cues, on the student's body, may support the child's receptive communication (Stremel & Schutz, 1995). For example, the communication

partner may touch under the child's arms to indicate that the child is about to be lifted or supported to stand.

Objects to Communicate. Many children who are congenitally deafblind will use objects to communicate. Whole or partial objects may be used. Rowland and Schweigert (1990) provided guidelines to teachers interested in the use of this form of communication. Iconicity is an important consideration when choosing representation. A symbol is more iconic when it more closely resembles the referent (Rowland & Schweigert). It would be easier for a blind or deafblind child to recognize symbols which have a close, physical resemblance to the referent. When working with a child with a visual disability, it is important to relate iconicity in terms of tactile features. The child's understanding of the symbol is enhanced by numerous tactual experiences with that symbol. For example, the use of several links of swing chain may be easier to comprehend than a portion of swing set stand piping since the child may have touched, or held onto the chain on many occasions. Representation for children who are blind or deafblind must be made on the basis of tactually salient features of the referent, not visually salient features. The same principle applies to the use of miniatures. While miniatures may contain tremendous detail, the detail is often visual and cannot be experienced tactually.

Communication partners will also need to use the objects, thus providing receptive modeling of this communication form for the child. Objects can be used to elicit choice making (Stremel & Schutz, 1995). The communication partner may simply present the child with two objects, allow time for exploration of the objects, and time delay for the child to choose one by selecting or by pushing away the undesirable object. Object cues may support the child's understanding of communication and routines. An example of an object cue would be to take the child's hand and put it in contact with a ball to represent that the next activity will be passing the ball.

An important application of object communication is the use of objects of reference. This is the use of objects or partial objects to represent people. The representation should have meaning, associated with the individual it represents (van Dijk, 1986). For example, the teacher who always wears barrettes would be well represented by a barrette. Objects of reference are important to children who are not yet able to use pictures or signs to represent people. The objects provide them with a mechanism to use when referring to or requesting a person who may not be present.

Textures to Communicate. A form of communication that has received attention in the past ten years is the use of textures. Textures are two-dimensional representations of a referent. Tangibles have a "clear, perceptual relationship to a referent" (Murray-Branch, 1991, 261), textures do not. The selection of textures may be entirely arbitrary. For example, a swatch of terry cloth might represent lunchtime. The texture communication form can be learned by pairing textures with the objects, people, or activities they represent. Textures make few demands on memory (Bailey, 1992; Murray-Branch, Udavari-Solner, & Bailey, 1991). The use of texture communication does not require spatial orientation to be understood. Textures are portable, easy to duplicate, mount and label. One possible limitation to the use of textures would be the individual's ability to discriminate a limited number of textures. In one case study of learners, aged 15 years and 19 years, with respective mental ages of 6-9 months and 18-24 months, Murray-Branch et al. (1991) demonstrated that learners could use the textures to communicate their needs. Based on these case studies, they suggest the following instructional sequence:

> association between texture and referent, searching and locating skills to find the texture, use of textures for requesting, discrimination between texture and a foil (or meaningless texture), use of textures for choice making, discrimination between textures representing different activities, scanning of displays to make requests and choice making when given multiple textures (p. 263-266).

Pictures to Communicate. Congenitally deafblind children with sufficient and stable vision may use pictures to communicate. Some may be able to visually discriminate the content of photographs, while others may be best served by the use of pictures or line drawings. Photographs may be too visually cluttered for some children, presenting them with figure/ground challenges. Pictures or drawings are easy to duplicate, mount and label for mutual understanding. An additional advantage for the child with functional vision is the visual stimulation gained from watching and participating in the drawing process (van Dijk, 1986).

Applications of Concrete Forms. An application of these concrete communication forms that is important to the development of symbolic language is the use of schedules, often called "anticipation shelves" (Stillman & Battle, 1981). Objects, partial objects, textures, pictures, and drawings can all be incorporated into this application. A schedule and calendar system is important to the child's sense of safety as it contributes to the child's understanding of the daily or weekly events. An anticipation shelf display, kept separate from the location of the actual activities that are referenced within it, may support the child's development toward symbolic representation (Stillman & Battle, 1981). The box may be partitioned or a display of separate baskets may be used. Within each basket or partitioned area, a representation for a particular activity is placed. The daily activities should be arranged in a left to right sequence, which can be previewed and reviewed with the student. A "finished" basket or container should be provided, in which the child will place each representation, following the completion of the corresponding activities. A tactile calendar system to represent the week, month, and year may also be developed.

A second application of concrete communication forms is the referent book, also known as a journal or memory book. Children with hearing share many oral stories about events from the past. Young children with vision are able to share photographs that represent early experiences. These representations support their memory of events and

subsequent shared communication and language about previous events. Referent books are representations of memories, events from the past. They can be created using partial objects or textures that are understood by the child and may be enjoyed much like the family photo album by children who have vision. For example, the experience of shopping in the grocery store would be best represented by selecting tactile representations of referents that were experienced by the child while shopping. If the child stopped and touched the bread bags, a piece of bread bag could be cut and attached to the referent page. The child's understanding of this representation can be supported by pairing the representation, in this case a piece of bread bag, with the actual object. The sequence of representation in the referent book should be based on the child's sequence of experiences in the store. Referent books or memory books help to build the concepts of sequence while supporting memory (MacFarland, 1995).

Augmentative Communication. Augmentative communication devices are useful for some deafblind children. Such devices can be used if the child has the ability to use a motor response to select. Pictures, textures, and even small or partial objects may be mounted on displays. Children with sufficient residual hearing are more likely to be reinforced by the use of devices with voice output. The use of individual boards or overlays that are situation specific may be most suitable for some children (Gamradt & Gunderson, 1989). Displays may be organized by categories, such as people, helping messages, and favorite activities. Each category can be placed in a distinct location on the display. Color coding is often used for children with sufficient vision to discriminate. Use of individual boards, suitable to specific situations may be most effective for some children.

Gesture. Much of the literature on gesture as a form of communication is specifically concerned with pointing as a later form of gesture (Stremel-Campbell &

Matthews, 1988). In their discussion of van Dijk's curricular approach, Stillman and Battle (1981) contended that gestures must be natural, coming from within the child's perceptions. Therefore, within a given classroom, children may have different gestures for the same activity, based on the features of that activity, that are most salient to each child. Adults will need to use gestures in order to provide receptive models for the child, but those gestures should be based on what the child does with a given object or activity (Stillman & Battle, 1981). Such decisions are based on sensitive observations of each child. Adults will need to use gesture to express the give and take of objects, the movement of objects, and in greeting the child (Stremel, et al., 1990). Adults may facilitate the child's attainment of gestures by encouraging activities that require the child to imitate body movements (van Dijk, 1986). Zinnowbar and Marlew's (1985) four functions of gestures include: change behavior of others, express pleasure or displeasure, imitative gestures, and gestures to gain mutual attention on the same object (Siegel-Causey, Ernst, & Guess, 1988). Gesture may be an important prerequisite to sign language.

Sign Language. Sign language is an abstract, rule-based language. Whether the signs are presented in English word order or in American Sign Language, there is a logical, rule-based structure to the organization of sign language (Stokoe, 1981). Many congenitally deafblind children may learn signs, but never gain the competencies needed to make flexible use of sign language. The ideas that can be expressed through sign language are limitless. However, sign language makes significant demands on the child's motor and cognitive abilities. The child must be able to form the handshape, correctly orient it to the body, perform correct movement of the sign, use modulation for emphasis, and combine signs in a rule-based structure. If the child does acquire competency in the use of sign language, interpreters must be provided to facilitate interactions with non-signers.

While all people use a variety of communication forms, a larger number of communication forms does not ensure more effective communication (Calculator, 1988). The movement from concrete to abstract communication forms is supported by the van Dijk Curricular approach, which addresses the learning needs of children who are deafblind. van Dijk's focus of interaction is on the child. Communication begins with what and how the child is currently communicating, with the adult gently expanding or scaffolding (MacFarland, 1995). Adults support communication development in the context of interesting, meaningful, functional activities, and instruction in the natural setting (Siegel-Causey & Ernst, 1989).

Selection and Recognition of Expressive Forms. Kramer and Rosenfeld (1975) cited four criteria for the selection of communication forms for individuals who are deafblind: (1) age at onset and severity of hearing impairment; (2) age at onset and severity of visual impairment; (3) age of receiving corrective lens and amplification; and (4) level of mental disability. Additional considerations include: the child's physical needs, current forms of communication, and contexts, including likely communication partners, activities and routines. Rowland and Stremel-Campbell (1987) suggested that an expressive form should be chosen only if the child already responds to that form receptively.

Communication Partners and the Child's Forms. Communication partners and their ability to communicate in the child's preferred forms is a well documented concern in the literature. Stillman and Battle (1987b) studied the communication of classroom personnel with 30 students with severe disabilities, including 14 who are deafblind. They found that classroom personnel used conventional, formal forms of communication 60% of the time. These forms included speech, sign, and conventional nonverbal expressions. More than 50% of the communications were expressed orally, requiring the student to

receive in the auditory mode, even though almost half of the students in the study were deafblind. The study provides evidence to the severe mismatch that often exists between the teacher's expressed forms and students expressive forms. In addition to the issue of mismatched forms, adults were inconsistent in their use of forms. Through videotape analysis of teachers across activities, Stillman and Battle (1987a) found that the activity influenced the communication forms used by classroom personnel. For example, in one activity, the majority of teacher expressions were in formal, rule-based language, with no response expected. Only two communication forms were used during the activity. In a second activity, the same teacher interacting with the same student used 13 different communication forms as coded by the researchers, with the expectation that the student exhibit a response to the communications (Stillman & Battle, 1987a).

A second concern cited in the literature is the insistence of communication partners that the child repeat an expressed message in a more abstract form of communication. Classroom personnel sometimes insist that the child communicate in sign or in another abstract form when the child's communication message, already expressed in a more concrete form, was understood. Ferguson (1994) noted, "We still spend considerable time asking students redundant and meaningless questions just to get them to answer." When staff recognize what the child is communicating but insist that the child repeats the message in a different form, they violate the principle that the individual's use of a variety of communication forms should be respected (Calculator, 1988).

Communication intervention with children with severe disabilities has shifted from a focus on the forms of communication to include the other aspects of a communication system, as well as the interaction among the aspects. The functions or reasons for communication have received increased attention in recent years, as well as the aspect of context. A growing understanding of the role of communication partner and learning environments have shaped our move toward action research (Ferguson, 1994).

Early Functions of Communication

The second component of any language system is the intent or function of communication. While the terms "intents" and "functions" are often used interchangeably, it is important to clarify that intent is actually the purpose that the communicator intended and the function is what was interpreted by the communication partner. The following functions have been agreed upon as acquired early in the child's communication development: protesting, calling, showing objects, giving objects, answering, labeling, requesting objects, requesting actions, commenting on objects and commenting on actions (Cirrin & Rowland, 1985; Dore, 1974; Stremel-Campbell & Matthews; Waterson & Snow, 1978). Carpenter, Mastergeorge, and Coggins (1983) found the following sequence of emerging functions, based on their research with babies under 15 months of age: protesting, request for action, request for object, comment on action, comment on object, and answering.

Given the lack of research studies, we cannot assume that the acquisition of early intents and functions in deafblind children is the same as the acquisition in hearing and sighted or even deaf children. Nicholas, Geers, and Kozak (1994) compared the acquisition of early communication functions in prelingual hearing and deaf participants. They found that deaf children's acquisition of language functions was similar to their hearing peers but that the answer and request for information functions appeared approximately 12 months later in the deaf children. Perhaps most important, is the evidence that young deaf children's development of verbal communication functions paralleled their earlier development of the same nonverbal communication functions. For example, if a child expressed protest in a nonverbal form prior to the expression of requests for objects in a nonverbal form, the same acquisition sequence was found to occur as the child acquired more abstract forms of communication. While more research is needed on the acquisition of communication functions for deaf children (Nicholas, et al.) and deafblind children, the results of this study draws attention to the importance of

responding to and interpreting the child's nonverbal communications. Children need adults who will perform this role so that they will be motivated to persist in their communicative attempts. In addition to the adult's role in recognizing and interpreting the child's nonverbal communication, the adult can function as a model of early communication functions. The range of functions exhibited by the child is restricted by the range of modeling and opportunities created by the caregiver and communication partners. Adults must create opportunities for children who are deafblind to acquire a range of functions, while incorporating the modeling of early communication functions (Rowland & Stremel-Campbell, 1987).

Content

The third aspect of any language system is content. Content is the message itself and is integrally connected to the activity in which the child is participating. Personal experience, conceptual development, the current activity and the communication partner limit the child's possible messages. It is also influenced by the child's need for communication forms that suit his current developmental level and individual physical and cognitive characteristics. Therefore, one effective way to expand on a child's content is to develop ecological inventories, to identify the environments the child currently frequents, activities within those environments, and possible appropriate vocabulary (Murray-Branch, 1991). The Personal Futures Planning approach (Stremel & Shutz, 1995) can enhance the instructional team's understanding of the environments in which an individual participates. The team can collaboratively create a map depicting the environments that the child currently frequents while creating a second map of expanded opportunities or new places the child might enjoy. Preferences maps may be used to collaboratively record the child's preferences which could include people, objects, and activities (Romer & Romer, 1995). Preferences are one basis on which possible vocabulary can be developed. The child may be more motivated to acquire vocabulary

associated with preferred activities and people, particularly if choice-making is used in instruction.

Several other strategies have been found useful to the selection of vocabulary for instruction. The child's interactions and interests should drive the vocabulary of focus. Observation of the child's current activities can inform our understanding about what any child would need to communicate in that circumstance. The vocabulary that is used by peers, in the same circumstance, would be one criterion for vocabulary selection (Gamradt & Gunderson, 1989). In addition to observation, Bottorf and DePape (1982) suggested requesting lists from others, across environments. They suggested that vocabulary selection be based on what vocabulary could be immediately useful and can be used across environments. Vocabulary is more likely to be learned and used if it is of high interest to the child (Murray-Branch, Udavari-Solner, & Bailey, 1991). Even though we may select vocabulary on which to focus our instructional supports, the child's emerging interest should continue to drive our communication interventions. It is necessary to monitor the child's use of selected vocabulary to determine if the selected vocabulary items are used and to allow for appropriate modifications of selected vocabulary (Gamradt & Gunderson).

Calculator (1988) has expressed concern over the generalization of vocabulary across settings. Individuals with severe disabilities might be limited in their ability to use vocabulary items in a generalized fashion. They may be limited to using the vocabulary in exactly the context in which the vocabulary was taught, raising concern over inflexibility. We cannot assume that responses taught in one particular situation will generalize to another (Calculator). Vocabulary items that are useful across environments may support generalization, as will explicit instruction on the flexible use of vocabulary.

Context

Much has been written about the fourth aspect of communication, context (Calculator & Dollaghan, 1982; Rowland & Schweigert, 1993; Siegel-Causey & Ernst, 1989; Stremel, 1995). Deafblindness may interfere with the individual's ability to recognize and interpret a variety of contextual clues. Deafblindness creates accessibility issues. The individual who is deafblind may not know that a communication partner is initiating a conversation or that a shared topic of conversation even exists (Rowland & Schweigert, 1993). The proposed model, "Four Aspects of Communication" organizes the contextual issues discussed in the literature according to the following structure: (a) physical environment (b) individual's characteristics, (c) activity and routine, (d) communication partners; and (e) process of communication. Each of the components of context are discussed below.

Physical environment. The first component of the aspect of context is the physical environment, which includes the physical layout of the room and activity, auditory and visual input, and levels of stimulation. Children who are deafblind require physical environments that are organized and safe, allowing them to explore. A room that is overloaded with visual stimuli may interfere with the child's ability to visually attend to items of importance. Too much visual information may also cause fatigue as the child's struggles to locate and attend to items of immediate importance. The noise level is critical for if it is too high the child may not be able to make optimum use of residual hearing. Noise levels may also influence the child's behavior. Rikhye, Gothelf, and Appel (1989) created a checklist to support teachers in establishing and maintaining an environment that is conducive to learning for children who are deafblind.

Individual's characteristics. The second component of context is the individual's characteristics, capturing the child's personality traits, learning traits, and background

knowledge, in addition to the child's disabilities and needed adaptations. This includes the individual's need to compensate for sensory loss, to access the information that is usually received through the senses of vision and hearing (Downing & Siegel-Causey, 1988). The child may need instruction to tolerate and then gain benefit from the use of glasses and hearing aids, as well as other adaptive devices that support vision and hearing. The maintenance of glasses and hearing aids are necessary to ensure that the child is gaining full benefit from their use. Glasses and ear molds must be cleaned. The child's hearing aids and batteries must be checked daily and the child should be taught to do this whenever possible. Both hearing aides and glasses must fit properly or the child may be uncomfortable or miss information. In addition to the provision to support vision and hearing, adaptive equipment may be needed to support the child's other physical needs. Adaptive equipment may be required to support appropriate posture, facilitate movement, or to support involvement in fine motor activities.

Consideration of the child's needs and appropriate adaptations and accommodations goes beyond the child's visual, auditory, and other physical characteristics. The child's level of development, interests, motivation, and learning style are important considerations when planning for communication intervention. The child's preferences of input in the visual, auditory, tactile, or kinesthetic mode must be considered. Communication development occurs within the context of specific activities and routines, within which the teacher must use instructional strategies that are interpretable to the child.

Activities and routines. Activities and routines are the third component of context. Stremel and Schutz (1995) suggested that Personal Futures Planning and the I.E.P. should drive the routines and activities that are needed by each individual. Ecological inventories may also support the selection of meaningful activities that are enjoyed by peers of the same age.

Effective instruction is based on understanding the distance between the child's actual developmental level and the level at which the child can achieve success when provided with the support and scaffolding of a more skilled other (Vygotsky, 1978). Lev Vygotsky (1978; 1986) termed this distance as the zone of proximal development or the Z.P.D. Effective teaching involves the selection of activities and levels of participation that are above what the child can do independently, but still within the zone of proximal development.

Communication development occurs within the context of activities. Each activity has a beginning, a middle, and an end, allowing opportunities for problem solving within each of these stages (Brown & Lehr, 1993). Meaningful activities for children who are congenitally deafblind are functional, age appropriate (Siegel-Causey & Ernst, 1989) and involve active participation, not physical manipulation through the activity (Brown & Lehr, 1993). Activities that require turntaking as part of sustained interaction, such as motor sequences and games shared with teachers and caregivers, support communicative development. van Dijk (1986) suggested that activities be developed around what the child is already doing (MacFarland, 1995). Instruction within activities, that occur naturally, supports the child's development of communication competencies. Murray-Branch et al. (1991) taught the use of textured communication in the context of naturally occurring events. The texture representing a food, for example, could be presented when the child is exhibiting behaviors to communicate hunger.

Instructional routines are important to the child's feelings of safety and to the child's development of anticipation (Downing & Siegel-Causey, 1988; van Dijk, 1986). Consistency in instructional routines will support the child in learning to predict what will come next (Downing & Siegel-Causey). Anticipation shelves or schedules, as discussed in the literature review of forms, are important to supporting the child's understanding of the daily sequence or routine. When the child has learned the sequence of an activity or the sequence of the morning routine, the child will be able to

demonstrate anticipation. The child's anticipation of upcoming events may result in communicative attempts to express pleasure or protest. Once the child thoroughly understands a routine, change can be interspersed to elicit communication attempts (Siegel-Causey, Ernst, & Guess, 1988).

Communication partners. The fourth component of context is the communication partner or in a broader sense, the community. Communication partners may be adults or children. Both may need the support of interpreters or interveners, in addition to instruction in the forms of communication used by the person who is deafblind in order to have successful interactions. People with severe disabilities, including those who are congenitally deafblind, often have a limited number of communication partners (Calculator, 1988; Hagood, 1994). An expansion of the number of communication partners may result in a greater number of opportunities to share communication around a greater number of topics.

Edwards and Mercer (1987) declared the importance of the mental context to learning. Although communication is bound by an activity, communication partners must establish a shared knowledge and discourse, specific to the activity, if learning is to occur. Children who are congenitally deafblind, communicating at an intentional presymbolic to early symbolic level of communication challenge our ability to determine what constitutes shared knowledge. Until we come to know what they know, we cannot expand their understandings through our interactions. Communication partners striving to expand the communicative development of learners who are congenitally deafblind have the unique responsibility to uncover the child's understandings through intense examination of the child's previous experiences and understandings.

Butterfield and Arthur (1995) called for increased emphasis on the role of communication partners in the communicative development of learners with severe intellectual disabilities. The role of communication partners is also critical to the

development of learners who are congenitally deafblind because deafblindness reduces the incidental information that the child will access. Effective teachers will create positive classroom environments in which communication is expected (Siegel-Causey & Downing, 1987). When interacting, the teacher must join the child at the child's level to establish trust (MacFarland, 1995). This requires sensitivity of the teacher who must come to know when the child is ready to interact and respond. Teachers and other communication partners must effectively respond to the child's readiness states. The teacher responds to the child's readiness, then uses scaffolding to support the most advanced behavior that is possible from the child (Siegel-Causey, et al., 1988). The use of time delay is one scaffolding strategy (Siegel-Causey & Downing, 1987).

The child who is deafblind may not recognize impending social interactions beyond his own physical proximity (Mar & Sal, 1995), thus indicating the need for communication partners who will establish such proximity and provide the deafblind child with cues to their presence. Rowland (1989) examined the number of cues to communicate provided by teachers of 14 deafblind children and found that the children, who initiated communication less often, received fewer cues to communicate. Children communicating at a presymbolic level, received half as many supports or cues to communicate. This suggests that the child's level of communication development influences the teacher's provision of cues and supports (Rowland, 1989).

In addition to recognizing the child's readiness to interact, the communication partner must be able to recognize the child's initiations in a variety of communication forms. Calculator (1988) found that school personnel were poor at recognizing and responding to the initiations of students with severe disabilities. Such initiations may be missed when the child doesn't establish mutual attention. The child with sufficient functional vision may gaze toward the communication partner as a signal to his impending initiation. Other children may establish physical proximity without looking toward the communication partner. This lack of mutuality may occur as a result of how

adults establish interaction as well. The use of physical proximity, pause, eye contact, and touch may all support the establishment of mutuality prior to initiating communication. The establishment of mutuality can also be supported through activities that incorporate sequences and turn taking.

Responding to the child's communications in a contingent manner is important to the child's motivation to communicate. Contingent responses, those that predictably and consistently result as a response to the child's communicative attempts, provide the child with a sense of control (Siegel-Causey & Downing, 1987). The child's sense of control can also be developed through activities and interactions that build the concept of cause and effect (Snow, 1984).

Children who are congenitally deafblind need communication partners who can create opportunities for them to learn the competencies of communication (Butterfield & Arthur, 1995). Creating opportunities requires the recognition that communication should occur throughout the day and to perceive communication as an integrated skill that requires facilitation and support. Teachers may observe for students' interest and use this as a guide for building opportunities (Butterfield & Arthur, 1995; Hagood, 1994).

One way to increase the child's opportunities to communicate is to reduce teacher directives (Rowland & Stremel-Campbell, 1987). The child who is congenitally deafblind will need a great deal of 1:1 interaction and feedback. This should not be construed to mean that the child needs continual 1:1 programming. Such a situation, whether the instruction is with a teacher or a paraprofessional, can create dependency that may interfere with the child's need and motivation to communicate.

Teachers can support communication development by creating a need for the child to communicate. The teacher may leave out an expected object from a favorite activity or routine. For example, if the children are accustomed to using the pump soap to wash up prior to snack, the teacher may forget to place it there. This would create the opportunity for children to either request the soap or protest its omission. Other ways to

create the need to communicate include placing a favorite or expected object just out of reach or by disturbing a well understood routine.

Another way to create opportunities for communication is to offer choices (Brown & Lehr, 1993; Downing & Siegel-Causey, 1988; Stremel & Schutz, 1995). Many congenitally deafblind individuals are passive. The provision of choice making opportunities provides them with the opportunity to provide input that results in change (Bottorf & DePape, 1982). Children who are deafblind may have difficulty understanding cause and effect (Siegel-Causey, Ernst, & Guess, 1988). Creating opportunities which provide for student control will support the child in understanding that his actions result in predictable consequences.

Teachers may require support in understanding how to create opportunities for students who are deafblind to communicate. Haring, Neetz, Lovinger, Peck, and Semmel (1987) found that teachers increased the number of opportunities created for communication by almost 700%, following an intervention using written instructional materials and videotapes for teacher review in a ten day intervention study.

Children who are congenitally deafblind need to be able to communicate with their peers. Strategies such as the people maps of Personal Futures Planning (Romer & Romer, 1995) and The Circle of Friends (Falvey, Forest, Pearpoint, Rosenberg, 1994) can be used to examine the number and kinds of relationships the child currently has. The Circle of Friends strategies requires the instructional team, including family and friends, to map out the four levels of people who interact with the person who has a disability. The levels range from exchange, persons you pay to be with you, to intimacy, the people you couldn't live without. Many people with severe disabilities, including those who are deafblind, have interactions most often with family members or paid professionals. A healthy system of support includes friends and relationships at all levels of intimacy (Falvey et al., 1994). Too often the need for help becomes the impetus to the support of friendships. While friends help each other, too much help can create dependency.

Friendship should be based on common interests, not on the child's need for help (Van der Klift & Kunc, 1994). Friendships founded on mutual interests and characterized by reciprocity will support the child's motivation to interact.

Communication partners, within the context of the community, hold beliefs about people with disabilities, including those who are congenitally deafblind. The communication partner's role extends beyond support of the child's communication to support of the child's participation in the community. Intervention on communication skills is not enough. Effective intervention includes facilitating the individual to full membership and active participation in the community. A positive social climate includes provision for physical proximity and cooperatively shared materials (Siegel-Causey & Downing, 1987). Ferguson (1994, p. 10) argued that "...although communication seems to ground language acquisition ...membership grounds communication."

Process of communication. The fifth component of context is the process of communication. Butterfield and Arthur (1995) called for an increased attention to communication as a process of social interaction. The process of communication requires the individual to initiate, sustain, and terminate interactions. Rowland and Stremel-Campbell (1987) refered to this concept as dyadic interaction skills which are "those skills necessary to initiate, respond to, and sustain communication between partners" (p. 69). Initiation interaction with an individual who is deafblind involves the following: inform the individual who is deafblind that you are there, identify self in an appropriate communication form, and pause for the person to indicate the readiness to interact. Children who are deafblind should be taught to establish visual attention or mutual gaze prior to initiating an interaction. Locating a communication partner, initiating an interaction, sustaining interactions for multiple turns, and using conventional ways to terminate are all communication skills that need to be taught (Hagood, 1994).

The four aspects of communication, form, function, content, and context co-exist and mutually influence one another. The components of context set the stage for communication. For example, the appropriateness of a message varies according to the activity and the communication partners or community. Intentional communication requires the integration of form and function. At this level the individual understands how to use a particular form or forms of communication to express content for a specific function (Butterfield & Arthur, 1995).

Teachers and the Change Process

Consideration of the change process and specifically, how teachers' change in thinking and practice, is of importance to researchers concerned with the issue of why research so seldom translates into classroom practice. While once this lack of application may have been viewed as a result of teachers' reluctance or disinterest, there is a growing interest in the role of teacher change, teacher cognitions, and teacher development on the implementation of research (Malouf & Schiller, 1995).

Barriers to Change in Teaching Practice

Numerous researchers have sought to identify the factors that inhibit or enhance teachers' use of research knowledge (Englert, Tarrant, & Rozendal, 1993; Huberman, 1990; Huberman & Miles, 1984; Richardson, 1990). Factors that interfere with ease of implementation in the classroom include: lack of time, lack of resources, abstract or unclear innovations or explanations of the innovation, teacher's group focus, teacher's isolation, the rapid pace of classroom instruction, teacher beliefs about the innovation, teacher beliefs about students, and lack of administrative support (Englert et al., 1993; Richardson, 1990). The coexistence of various teaching activities which occur simultaneously, such as content presentation, ongoing student assessment, and teacher responses point to the complexity of teaching. The complex nature of teaching may also

interfere with the implementation of instructional innovations (Huberman & Miles, 1984).

Based on their extensive study of teacher change in practice in three schools, Elmore, Peterson, and McCarthey (1996) concluded that changes in teaching practice are more an issue of addressing knowledge and skill acquisition and retention at the individual teacher level, than addressing change at a structural, administrative or organizational level. Marzano, Pickering, and Brandt (1990, p. 18) presented four principles of learning that may inform our understanding of teachers' change in practice. The first principle is that the learner must believe that the new knowledge is of value. Second, the learner must acquire two kinds of knowledge, declarative and procedural. Declarative knowledge includes all the facts and contents of the new innovation. Procedural knowledge is the process or "how to's" of knowledge implementation. The third principle is that once knowledge is acquired, it changes over time. This occurs as old knowledge is merged with the new knowledge and reorganization results. The use of the new knowledge produces change as the learner struggles to incorporate the knowledge into real life contexts. The fourth principle is that effective learners are in-tune to their own thinking, seek accuracy, and are functioning at the outer edge of their ability. Adults need opportunities to experiment with new practices, guided reflection, discussion, time for change, personal support, and challenge (Loucks-Horsely, 1987) in order to effect improvement in teaching practice.

Facilitating Change in Teaching Practices

Teachers' cognitions about their current practice, their students, and the innovation will influence their instructional choices. First, teachers must have the desire to change which implies a dissatisfaction with current practice (Fullan, 1991). If the innovation demands practice that is vastly different from the teacher's current practice it is unlikely to be implemented (Guskey, 1986). Doyle and Ponder (1977) suggested that

teachers judge the worthiness of an innovation on the basis of its practicality given the daily structure of the classroom, their individual situations and the innovation's fit within their current teaching practice, and its cost in terms of time, money, and social risks to implement. When such major change is required, teachers cannot be expected to adopt the entire change at once, rather they will adopt one idea or strategy at a time. Teachers can be supported to make large changes in practice through the provision of continuous feedback about the innovation's impact on student learning. Such feedback is critical when the innovation presents information and instructional practice that is entirely new to the teacher (Guskey).

Teachers are very concerned about student progress. Teacher's beliefs about their students and about the innovation's effect on student learning outcomes, or the efficacy of the innovation, bears a strong influence on the teacher's adoption of the change (Englert, et al., 1993; Englert & Tarrant, 1995; Fullan, 1991; Guskey, 1986; McLaughlin, 1990). Even when teachers are not part of the process of developing the innovation, they are willing to participate in its implementation if the innovation is clear and of observable benefit to their students (Guskey). The association between the adoption of the innovation and student progress is so strong that teachers will retain only those ideas that worked well in their classroom discarding the rest. Guskey's review of research on fifty-two teachers trained in mastery learning, provided evidence that improved learning outcomes result in a change in teacher attitude and beliefs about the innovation. Teacher commitment to the innovation will increase after classroom effectiveness is experienced. Follow-up supports must continue to emphasize the connection between the innovation and student progress (Guskey). Acquarelli and Mumme (1996) pointed to the significance of the interaction between beliefs and practices in saying, "... our behavior provides the grist for the examination of our belief. Without concrete experience, discussion of beliefs can remain empty talk, untethered to practice (p. 481)."

An understanding of the process of change can enhance professional development programs (Loucks-Horsely & Stigelbauer, 1991). The process of change is slow and highly individualized (Pugach & Johnson, 1995). When presented with an instructional innovation, teachers will absorb only part of what is presented, usually the part that is most immediately useful to their practice. Once this piece is merged into their current everyday practice, they are ready to absorb and apply a new piece of information. Teachers need to make the innovation "their own" through the integration of their own practical knowledge of teaching with the new innovation (Bos, 1995; Englert et al., 1993). Significant teacher change may require more than a year (Fullan, 1991; Englert & Tarrant, 1995).

Recognizing teacher concerns about the innovation. Change is a developmental process that affects individuals in highly personal ways. "The process of changing practice demands risk taking, acceptance of divergent ideas about practice, and a tolerance for uncertainty as the teacher seeks to implement an innovation which could influence student progress" (Englert & Tarrant, 1995, p. 336). Hall, Wallace, and Dossett (1973) proposed a theoretical model to explain teacher's levels of concern about instructional innovations. The original concept of teachers' "Stages of Concern about the Innovation" (Hall, et al., 1973) has been verified by subsequent studies (Hall, Rutherford, Hord, & Huling-Austin, 1984; Hall & Loucks, 1978). The original conceptualization is now more commonly known as CBAM, Concerns Based Adoption Model, and is cited as one way of supporting teachers' use of an innovation (Sparks, 1983). The original conceptualization presented six stages of concern, which have remained intact in the reformation as CBAM. The levels are:

0=awareness. There is little concern about the innovation at this stage.

1=informational. The teacher is gaining knowledge about the general characteristics of the innovation, its effects and requirements.

2=personal. The teacher's focus is on personal concerns, such as personal rewards, costs, organizational issues, and status concerns.

3=management. The teacher is focused on how to use the innovation. This includes interests in efficiency, organization, management and scheduling of time within the classroom.

4=consequence. Concern is centered on the impact of the innovation on students, its relevance to outcomes and evaluation.

5=collaboration. The teacher is concerned about sharing with others about how best to use the innovation to meet student needs.

6=refocusing. The teacher's focus is on broader benefits of innovation or ways of changing innovation to improve it (Loucks-Horsely & Stiegelbauer, 1991, p. 20).

Verification of this model has revealed that most teachers are focused on awareness, informational concerns, personal implications, or management issues, prior to the implementation of an innovation. Teachers' concerns are an important consideration to innovators in professional development.

Effective Staff Development

Staff development programs often treat teachers as passive recipients of knowledge, resulting in a lack of sustained change in teacher practice (Englert, et al., 1993). Staff development programs, concerned with teachers' implementation of knowledge, consider not only the content areas for improvement, but also the process of change and elements of effective staff development (Glang, Gersten, & Morvant, 1994). Effective teacher development programs will recognize the needs of teachers as well as the needs of students. Such programs will move beyond previous models which regarded the teacher as a passive recipient to a new view of teachers as active participants in the creation of knowledge (Fullan, 1991).

In their review of more than two hundred research studies, employing a range of research designs, Joyce and Showers (1980) found that the following characteristics were present in effective staff development programs: presentation of theory, modeling or

demonstration of skills, practice that is simulated or in the classroom, and coaching. The presentation of theory provides teachers with new ideas but does not move them beyond an awareness of the innovation. While it is important to provide a conceptual basis of the instructional innovation, the innovator must go beyond a theoretical presentation to provide teachers with specific activities and strategies for implementation (Englert, et al., 1993). In synthesizing the current research, Glang et al., (1994) argued that teachers "crave concreteness, specificity, intensity, and practicality in professional development efforts" (p. 227). Teachers want to take something away from staff development activities that they can immediately use (Guskey, 1986). Broyles and Tillman (1985) suggested that innovators keep the presentation of theory short and to the point, immediately followed by implications for teaching practice. Shumm and Vaughn (1995) found that teachers were most likely to implement the strategies that were covered most in-depth. Glang et al. (1994) found that teachers appreciated direct consultation that resulted in immediate improvement in student performance.

Successful staff development programs are characterized by a sense of collaboration, risk taking, incorporation of theoretical and practical knowledge, active participation of teachers in decision making, providing enough time to assimilate new knowledge, administrative support, incentives for participation, respect for adult learning characteristics, and integration of individual and school district goals (Loucks-Horsley, 1987, p. 8). Friend and Cook (1996) defined interpersonal collaboration as "a style for direct interaction between at least two coequal parties voluntarily engaged in shared decision making as they work toward a common goal" (p. 6). Innovators seeking to impact on teacher practice will want to use an approach that is infused with the collaborative ethic.

In-services

Although in-services are the most common approach to staff development, in-services offered as a "one shot deal" without follow-up are largely ineffective (Elmore, Peterson, & McCarthey, 1996; Shumm & Vaughn, 1995; Sparks, 1983). In addition to the problem with the process of information delivery, is the basic assumption that an outsider presents information to fix a perceived problem experienced by teachers. This "deficit point of view" (Jackson, 1990), has been replaced by what Jackson calls a "growth point of view." This perspective assumes that teaching is complex, values the teachers' knowledge and conceives of the role of in-service as being in support of teachers' thinking about classroom practice. Just hearing about the innovation is not enough. It does not ensure that teachers will know how to put the ideas into practice (Elmore, et al. 1996). When an innovation is presented in one session, without follow-up supports, little will be taken away. It is also likely that the innovation will be distorted in the implementation phase (Huberman, 1990). The presentation of new theoretical concepts and teaching strategies is but one aspect of teacher development, the second involves using the innovation and evaluating its success. Teachers need support for both aspects of development (Bell & Gilbert, 1994).

The presentation of the in-service will be enhanced by providing the following: (1) clear objectives; (2) a prepared agenda; (3) demonstrations of main ideas; and (4) time for questions and practice (Hagerty, 1990). Effective staff developers seek the support of administrators who may support the teacher's efforts by providing time for discussion and practice and additional resources to support implementation (Schumaker & Clark, 1990).

The most effective in-services include theory, modeling, practice, structured feedback, and coaching (Joyce & Showers, 1990). Coaching is only useful if accompanied by the learning of theory, modeling, practice and feedback. Direct coaching, involving a "hands-on approach in the classroom, will be required by some

teachers and may be particularly important when the innovation is composed of new knowledge. Joyce & Showers (1982) drew an analogy between the coaching of teachers and the coaching of athletes. Both need the presentation of theory and the opportunity to practice and to apply skills in appropriate contexts. The aim for both is to achieve a high level of skill during the training, and to expect challenge with implementation, as it is another phase of learning.

An innovation's success can be judged by the following criteria: (1) effectiveness; (2) fidelity; (3) longevity; and (4) adaptability (Bos, 1995). An innovation is effective when its goals are accomplished. Fidelity is exhibited when the changes in practice are what the innovator intended. Longevity refers to the innovation's ability to survive the test of time. Successful innovations possess the characteristic of adaptability. They can be generalized to various settings, and adapted to suit the needs of individuals, while maintaining the integrity of the innovation (Bos, 1995). An innovation is more likely to be successfully implemented when follow-up supports are provided.

Follow-Up Supports

Since the process of change is slow, teachers need long term follow-up supports to successfully implement significant changes in instructional practice (Englert, et al., 1993; Guskey, 1986; Oja, 1993). Joyce and Showers (1980) found that in addition to the presentation of theory, modeling, discussion, and feedback were also instrumental in the adoption of change in practice, in the 200 studies they reviewed. While modeling has a stronger impact than the presentation of theory alone, it is not enough to ensure acquisition of new knowledge. Modeling may occur in the form of real-life demonstrations or through the use of video or audiotapes. Modeling is an effective support because it helps teachers to see what the new practice looks like (Ball, 1996; Elmore, et al., 1996). However, teachers need time to practice and also require feedback. Discussion about the new practice is worthwhile, but it can be made most meaningful

when it is structured. Structured discussions provide the innovator and practitioner with points of focus. Feedback to the teacher was also discovered to be meaningful to the process of change. Teachers need opportunities to observe their own teaching practice and to reflect. This can be done alone, with other teachers, supervisors or university researchers (Joyce & Showers, 1982).

Coaching. Coaches provide teachers with feedback that is specific to their particular classroom context. They assist the teacher in recognizing the students' responses to the innovation and in making adaptations to the model. An additional role of coaches is to support the teacher by probing into the teacher's reasoning (Ball, 1996). Coaches can support teachers to recognize the reasoning beyond their actions (Langer & Colton, 1994). Stimulated recall (Clark & Peterson, 1986, chap. 9) is one mechanism that can be used to help teachers make the connection between their thinking and action explicit. Videotapes and/or audiotapes of the teacher in practice can be replayed. The teacher is asked to share her thoughts during the viewed teaching sequence. In their review of educational research, Clark and Peterson (1986) found stimulated recall incorporated a variety of strategies. Some studies included viewing of the entire tape, while others viewed only particular teaching sequences. In some instances, the teacher chose the teaching sequences to be viewed, in others, the researcher chose. Some studies used a combination of researcher and teacher chosen sequences. While reflecting on the education field's enthusiasm for the use of videotapes to support reflection, Ball (1996) raised concern about the need for educators and researchers to know more about how teachers learn through the use of videotapes. Shumm and Vaughn (1995) found mixed results in their use of videotapes to support teacher reflection, due to the stress involved with intensive observation and interaction with the researcher. Some teachers may not be comfortable with such intense interaction. Coaching goes beyond simply providing support for the implementation of the innovation. Coaching involves shared reflections

between the teacher and the coach. It is through this shared problem solving that teachers may improve instructional practice and innovators may gain information important to the reshaping of the innovation.

Learning communities. Learning communities, comprised of teachers and university researchers, support teachers in the implementation of new knowledge. Acquarelli and Mumme (1996) suggested that inquiry must be the focus of the community to support teacher's future learning. Within such a community, teachers must be free to make decisions about curriculum. They must choose which elements of the staff development project to implement, as well as how they will be implemented. Teachers' talk shared within these discourse communities serves to tie together theoretical and practical knowledge. It is within these learning communities that a "shared knowledge and "shared language" is provided by the innovator (Shumm & Vaughn, 1995), while each teacher is free to make instructional decisions. Teachers' understandings of the day to day issues associated with implementation yields important information to researchers who may redesign the innovation in collaboration with teachers (Englert, et al., 1993).

Learning communities support the reflection of teachers and researchers. Reflection is vital to the improvement of teaching practice (Anning, 1988; Shulman, 1986). It is difficult for teachers to find the time to actively reflect on their teaching practices. Effective professional development programs recognize the importance of reflection and the necessity of reflective teaching (Loucks-Horsely, 1987). Teachers need the time and a place to reflect about their practice. This can be done by participating in action research or keeping journals. (Ball, 1996; Langer & Colton, 1994). Teachers need guided reflection, reflection that is structured around key concepts associated with the innovation and its implementation. They also need time for change to occur, personal support, and challenge (Loucks-Horsely, 1987). The researcher and teacher relationship,

within the learning community, may well determine whether or not the innovation is used. The researcher's knowledge and the practitioner's knowledge inform each other and the innovation of study. Teachers present the researcher with discrepant examples, interpretations that differ from the researcher (Huberman, 1990). Sustained teacher change will require us to move in the direction of "mutual adaptation" (Sparks, 1983) where the innovation and teacher practice are altered by each other (Englert, et al., 1993; Navarro, 1992).

Professional development innovators and teacher researchers can use the literature on teacher change and effective staff development in developing a process for instructional innovation model delivery and reformation that occurs within the context of learning communities shared by teachers and researchers.

Summary of Literature Review

The four aspects of communication is one structure under which best practices in communication intervention for learners who are congenitally deafblind can be organized. The successful implementation of any new intervention model may depend on how such information is presented to teachers and on the teacher's ability to influence the reformation of the model. While one shot in-services are not usually effective, there is a need for an approach to the preparation of practicing teachers that will enhance their communication interventions, while also being efficient, given the largely unmet need of deafblind learners for teachers with professional preparation in deafblindness. Effective staff development approaches must incorporate what we know about the change process and adult learning. In-service models focused on teachers' cognitions and practice in communication intervention for children who are congenitally deafblind will integrate and synthesize the best practices in the field of deafblindness. If in-service content is to be applied in classroom instruction, teachers will need follow-up support and time to integrate the in-service information and any follow-up modeling and coaching with their

own cognitions and current practices. Teachers' daily experiences hold important information for the innovator who may need to reformulate the theoretical model based on teacher input.

CHAPTER THREE

METHODOLOGY

This study examined two teachers' thinking and practices in communication intervention for children who are congenitally deafblind and functioning at the intentional presymbolic to early symbolic levels of communication. The qualitative design used was modified analytic induction. The qualitative methodologies of interview, observation, and written document study were employed. The purpose of the study was to examine the usefulness of a communication intervention model, Four Aspects of Communication, to teacher thinking and practice. This communication intervention model was provided to the teachers through an in-service and a collaborative follow-up approach that embedded the literature bases on teacher change and effective staff development. Each teacher chose which elements of the model to implement, providing insight into the usefulness of the model to individual teachers. Teachers' concerns and daily experience with the model yielded new information to the innovator, resulting in reformation of the communication intervention model.

Qualitative Design

A qualitative design was chosen on the following basis:

1. The qualitative approach, specifically case studies, best suited the proposed research questions which focused on discovering and understanding teachers' cognition and behaviors, as well as the influence of a theoretical model on such thinking and behavior.

2. The populations of learners who are congenitally deafblind and their teachers are heterogeneous with students exhibiting varying levels of hearing, vision, and cognition. The professional preparation of the teachers serving deafblind children is also heterogeneous, with teachers endorsed in visual impairment, deafness, mental disability, and severe/multiple disabilities, all being likely teachers of children who are congenitally deafblind. The heterogeneity of the population of teachers and students impedes credible experimental design. A matching of samples for an experimental design would have been extremely difficult to establish. Rex (1992) spoke to same issue in the field of blindness, saying,

Research in education of visually handicapped learners is also plagued by the heterogeneity of the population, so pronounced that it is difficult to control the many variables. Heterogeneity, coupled with the difficulty of finding a sufficient number of students often makes group research inappropriate, particularly if high standards are to be maintained (p. 65).

3. The field of deafblind teacher education is relatively new. Although Perkins School for the Blind assumed the responsibility to educate both children with deafblindness and their teachers since 1837, it was the rubella epidemic of the 1960's that spurred the development of teacher preparation programs within the university setting (Collins, 1995). Inquiry into how best to prepare teachers, at the university level, is in its infancy. A "narrative of inquiry" as opposed to "a rhetoric of conclusions" (Brandt, 1992) seems appropriate to a field that is lacking in theoretical models to address preservice and in-service teacher needs.

4. A qualitative approach allowed for emerging categories in data analysis. The use of videotapes and audiotapes provided "post hoc clues" as to what was happening beyond the proposed variables (Reason & Rowan, 1981, 149).

5. Qualitative research supported the collection of detailed information about how the elements of the communication model, the process of change, effective staff development and teacher's cognitions and daily experiences mutually influenced each other and the teacher's acquisition of and implementation of new ideas. Broyles & Tillman (1985) spoke of the need for descriptive studies to gain understanding about what happens during the in-service training of teachers. Their study yielded information not only on the communication model but also on the in-service process, collaborative follow-up approaches and the process of teacher change.

6. The researcher sought to establish a learning experience involving both the researcher and the teachers in a collaborative examination and possible reformation of the proposed communication intervention model, recognizing that the teaching environment is fluid and active. While the roles of teacher and researcher are not exclusive, each can benefit from interaction with the other. In this relationship "researchers can benefit from teachers' practical knowledge and their knowledge of their students; and teachers can benefit from the theoretical and experimental knowledge of researchers (Englert et al. 1993, p. 469)."

Research Design

The qualitative design for this study was modified analytic induction (Ambert, Adler, Adler, & Detzner, 1995; Bodgan & Biklen, 1992). When using this design, the researcher developed a loosely defined explanation of the issue to be studied. The definition was modified and redefined until all examples or cases of the phenomena of study were accounted for. In this study, the four aspects of communication, combined with the Stages of Concern About the Innovation (Hall, Wallace, & Dossett, 1973) served

as proposed possible data analysis categories, while allowing for emerging themes and categories.

The use of multiple methodologies supports validity (Ambert, et al., 1995). In the proposed study, the established qualitative methods of observation, interview and written document analysis were used. The varied methodologies were chosen to delineate the two layers of "teacher cognition" and "teacher practice," associated with each research question. The following five data sources informed the study: transcripts of videotaped observations, transcripts of audiotaped interviews, transcripts of audiotaped stimulated recall sessions, written documents known as Action Plans, and researcher field notes. Observation was chosen as a method to learn about each teacher's practice in the context of her everyday classroom interaction. Interviews were selected as one method to examine teacher thinking about concepts associated with communication intervention and about teaching practices in relationship to the communication intervention concepts. Stimulated recall was used as an intervention, but was also a data source to expose teacher thinking about instructional practice as the teachers viewed segments of their own observation videotapes. Action Plans were developed as a written document to accomplish three goals: first, to inform about the differences between teacher thinking and practice; second, to provide documentation of teacher concerns; and third, to provide documentation of the types of supports requested by the participant teachers.

The modified analytic design was used to analyze the information provided by the data sources. This design is most appropriate to studies that begin with a conceptualization that may be refined as a result of the gathered data, due to the researcher's procedure of checking the fit of the data with the original conceptualization (Ambert et al. 1995). The research steps of modified analytic induction, as used in this study, were:

1. An explanation or definition of a phenomenon was developed.
2. Data was collected while referring to its fit within the proposed explanation.
3. The explanation was redeveloped to accommodate new data.
4. The researcher actively searched to find data that didn't fit the explanation.
5. The explanation was redefined until all the data is incorporated. (Bogdan & Biklen, 1992, p. 72).

The modified analytic induction design was particularly appropriate to this study because a specific topic of interest had been pre-established.

Setting

The setting for the in-service was determined by the school principal. In each case, the principal chose to use the teacher's classrooms. The teacher's classrooms were also the settings for the observations and follow-up coaching sessions. The pre-in-service interview for both teachers were done in their respective teacher lounges, while the post-in-service interviews for both teachers were completed in their individual classrooms. Both classrooms were within 1 1/2 hour drive of the university. The process of participant selection is described in "Sample/Participants."

Site One

Site One was a self contained classroom for children who were blind with additional disabilities, within a center-based program of more than 200 students with disabilities. The program was situated in a suburb of one of the largest cities in the state. The classroom consisted of nine children, all of whom were blind with additional disabilities, including three who were deafblind. The classroom was designated as a self-contained classroom for children with severe multiple disabilities. This designation does not necessarily connote severe mental disability. It is important to note that, in Michigan, a child may qualify as severely multiply impaired according to a formula that may

include severe mental disability in tandem with one additional disability or mild/moderate mental disability with two additional disabilities (Michigan Rules and Regulations, 1997). Therefore, classrooms identified for children with severe multiple disabilities may include children with varied levels of cognitive ability. One unusual feature of this classroom was that all of the children in this room lived together in a residential setting, while returning to their family homes for the weekend. The classroom teacher was state endorsed in mental disability and was taking classes toward an additional endorsement in learning disabilities. She also held an elementary teaching certificate. This teacher had the equivalent of two years experience working with children with visual disabilities and about fifteen months experience working with children who are congenitally deafblind. Two paraprofessionals also served in this room. Both had previous experience with the participant children. In addition to the classroom staff, one of the two participant children received direct services in physical therapy and occupational therapy. Both students received music therapy. These therapies were provided in the classroom. In addition, a teacher consultant for the visually impaired consulted at least monthly.

Site Two

Site Two was an oral/language deaf education classroom situated within a public elementary school with a student population of approximately two hundred. The students were of diverse backgrounds and countries of origin, with more than twenty languages spoken. The school was situated in a suburb of a large city. The classroom consisted of six students, including the participant child who is deafblind. The classroom teacher was state endorsed in deaf education and was taking courses toward an additional endorsement in learning disabilities. In addition, she held an elementary teaching certificate. The teacher was responsible for the instruction of the five deaf students, while a paraprofessional was responsible for programming for the deafblind student. The

deafblind student was most often in the company of his paraprofessional of nine years, although he was included in the larger group within the deaf education classroom at least several times each day. A second paraprofessional was assigned to support the education of the other five students. The student joined general education peers for special activities.

Sample/Participants

Study participants represented a non-random sample. Study participants (the sample) were identified by contacting special education directors in school districts known to have children who were congenitally deafblind, between the ages of 4-12, and communicating a an intentional, presymbolic to early symbolic level of communication. In addition, only districts within 1 and 1/2 hours of the university were contacted. The researcher's knowledge of the deafblind census in Michigan enhanced her ability to identify potentially appropriate districts. In both potential districts, the special education director referred the researcher to the building level administrator after approval was given at the district level. The researcher then presented the study to the building level administrator. The Site One building administrator discussed the study over the telephone and reviewed the full proposal, prior to giving consent for teacher contact. The Site Two building administrator required telephone discussion only, but a copy of the proposal was still forwarded. The teachers were contacted over the telephone after permission was granted by the special education director and building principal. The researcher then verified, with the teacher, that the children met the study criteria for participant selection. The researcher described the study over the telephone and asked each teacher if he/she was interested in participating. After gaining verbal consent, a cover letter and informed consent form, teacher description forms, and student description forms were sent to the classroom teacher. A cover letter and parent consent forms were enclosed for the teacher to distribute to the parents of participating children.

The forms were returned to the classroom teacher who in turn provided them to the researcher. The forms were reviewed by the researcher to verify that both the teachers and the children met the established participant criteria. The profile of the participating teachers follows.

Student Description

Students met the eligibility criteria established in the study proposal: congenitally deafblind, functioning at the intentional presymbolic to early symbolic level of communication, aged 4-12 years, using any of the following forms of communication: body language, facial expression, gestures, objects, partial objects, textures, and one to two word utterances in sign. Participant children also met the eligibility criteria for Michigan's deafblind project's registry, which adheres to the following federal definition of deafblindness:

> Individuals who are deafblind have auditory and visual impairments, the combination of which creates such severe communication and other developmental and learning needs, that the individual cannot be appropriately educated in special education programs solely for children and youth with hearing impairments, visual impairments, or severe disabilities without supplementary assistance to address their educational needs due to these dual, concurrent disabilities (Individuals with Disabilities Education Act, IDEA, 1997); Public Law 101-476.

Children who are deafblind usually have residual vision or hearing that they can be trained to use in functional ways. Warren's (1984) guidelines for participant description of blind children were also followed in determining what information to gather about each of the child participants. In addition, information on the child's hearing was included because the subjects were deafblind, not blind.

Participant Students

Two participant students were identified in Site One. The first student, Ron, was eight years old and was congenitally deafblind due to an unknown etiology. He had no functional vision or light perception, and his audiologist reported a profound,

sensorineural hearing loss. In addition to the deafblindness, Ron had mild cerebral palsy, specifically diplegia. Ron was ambulatory with minimal support. He was able to crawl independently for exploration. He was an intentional communicator who primarily communicated through body language. Ron's strongest receptive forms were tactile, specifically body language cues, often known as "touch cues."

The second student in Site One, Susie, was seven years old and was congenitally deafblind due to an unknown etiology. Susie's ophthalmological records reported her to be legally blind with suspected cortical blindness. She had a moderate sensorineural hearing loss. This was her unaided level of hearing, which is most relevant since she did not wear hearing aids. In addition to deafblindness, Susie had severe cerebral palsy, specifically spastic quadriplegia, and occasional seizures of mixed types. She was nonambulatory and had no independent means to move about and explore her environment. She spent her day in a wheelchair and placed in other adaptive equipment. Susie was an intentional communicator who primarily communicated through vocalization, body language, and an augmentative communication device. Susie's strongest receptive form was verbal.

The student in Site Two, Calvin, was twelve years old and was congenitally deafblind due to Adrenoleukodystrophy. The family and school staff were uncertain if he had the neonatal or childhood type, but the researcher was able to establish, after contacts with Kennedy Institute and John Hopkins, that it was the neonatal form. Calvin had no functional vision or light perception and had a severe to profound unaided hearing loss. He was augmented with a body aid that enabled him to hear speech. Calvin had motor challenges due to the etiology of Adrenoleukodystrophy. Although he was ambulatory with minimal support, he required constant supervision due to the concern over falling. Calvin had several ways of moving about his environment independently, including walking around something while holding onto a surface, or moving about in a scooter. He exhibited intentional communication and primarily communicated through

verbalization, vocalization, and a couple of home signs. Calvin's strongest receptive form was verbal.

Teacher Descriptions

Participant teachers were required to be special education teachers, not endorsed in or university prepared in the area of deafblindness. They could be teaching in any type of classroom or setting. The final criteria for selection of teachers required that the teacher had never attended a communication intervention training conducted by the researcher. This was required to ensure that teachers didn't have a previous familiarity with the communication intervention model developed by the researcher.

Participant Teachers

As mentioned within the site description, the teacher in Site One, Marty, possessed a general education elementary teaching certificate and special education endorsement in mental disability. She was currently enrolled in courses to earn an additional endorsement in learning disabilities. Marty had five years experience in special education classrooms. She had two years experience as a teacher of children with multiple disabilities, including vision loss and about 15 months experience working with the participant children. In addition, she had worked with a third congenitally deafblind child in one of her previous years of teaching.

The teacher in Site Two, Karen, possessed a general education elementary teaching certificate and a deaf education endorsement. She was taking classes toward an endorsement in learning disabilities. Karen had six years teaching experience in deaf education basic or resource classrooms. She had worked with two children who are deafblind. The first child was her student for three years, but she had known her for six years. She had also known the child in this study for six years, but had only been his

teacher for three months. Her classroom was a deaf education basic classroom, with some mainstreaming into general education.

Additional Adult Participants

Although this study focused on teacher thinking and practices in communication intervention, it was necessary to include an analysis of the interactions between the students and additional adults for three reasons. First, communication partners are an essential component of the aspect of context. The paraprofessionals in both sites served as frequent communication partners for study children. In fact, the vast majority of the communication interactions for two of the three study children were actually shared with the paraprofessionals. Certainly the teacher's thinking about communication intervention influenced this phenomena. The paraprofessionals were frequent communication partners for participant children. Second, the paraprofessional in Site Two was the most knowledgeable about Calvin and was expected to perform a role that far exceeded the usual functions of a paraprofessional. She was not only responsible to carry out lessons and to facilitate communication, but was responsible for the development of the child's program at the inception of this study. Third, the teachers' thinking and practices were likely to be influenced by viewing the interactions shared by the participant children and the paraprofessionals. They were most able to view these interactions during the Stimulated Recall Sessions.

The Interventions

Interventions for this study included an in-service series and follow up coaching in the classroom. The researcher provided the teachers, paraprofessionals, and parents with an information packet to supplement the in-service. In addition, teachers filled out written Action Plans that provided the researcher with requests for additional follow-up supports. Stimulated recall sessions were also used as an intervention to support

teacher's thinking about their own instructional practices. The in-service content is described below while the other interventions are described in the section entitled, "Data Collection Procedures."

In-service

The in-service was presented in the teacher's classroom and additional staff were allowed to attend. The in-service included instructional strategies, organized within the structure of the Four Aspects of Communication (Figure #1) and was delivered in two sessions in Site One and at the request of Site Two, the same content was spread over three shorter sessions. The content of both in-services was the same; Site Two staff simply expressed the preference that the content be divided into smaller segments. Each of the two in-service sessions in Site One lasted two hours, while the three in-service sessions in Site Two lasted 1 hour and 20 minutes each, for a total of four hours of in-service for each site. Teachers weren't able to get release time, so in-services were offered after school at both sites. The in-services were open to other staff within the two buildings. No financial compensation was provided to teachers who elected to stay after school for the in-services. Dates and times were based on teacher preferences. The in-services incorporated the use of examples, demonstrations, modeling and activities designed to support the acquisition of new knowledge. There was a two week interval between in-service sessions at both sites to allow teachers time to absorb the presented information.

The in-service was supplemented by an information packet developed by the researcher. The packet materials were organized using the structure of the four aspects: form, function, content, and context. Each packet was placed in a looseleaf binder and provided to the teacher. Additional copies were created for each paraprofessional and each parent of participant children. Copies were left for the teacher to distribute. A table of contents for the packet follows the in-service content outline.

In-service Content Outline

Part I

I. Deafblindness defined using the federal definition.

II. What is communication? How is it different from language?

III. What are the effects of deafblindness on learning?

IV. What are the effects of deafblindness on communication and language development?

V. What is the sequence of communication development?

VI. What are the four aspects of any communication or language system?

Form
Function
Content
Context

VII. What is the model for our communication intervention?

(This represented the end of Part I for Site Two. Their second session covered the rest of what was accomplished in Part I for Site One. Part II for Site One and Part III for Site Two were the same content.)

VIII. FORM

A. Rowland and Schweigert model: Concrete to more abstract forms
Discuss each of forms likely to be used by someone at intentional, presymbolic to early symbolic level of communication.

B. Selecting appropriate expressive/receptive forms

C. Using the child's preferred expressive forms

1. Recognizing and responding to the child
2. Adult's role as model

C. Application of forms:

1. Name symbols
2. Anticipation shelves
3. Conversation boxes
4. Referent books

Activity:

Ask participants to either:
1. Create a referent page or plan an anticipation shelf
2. Choose a name symbol or object of reference

IX. Questions

X. In-service Evaluation

Part II (Site One) and Part III (Site Two)

I. Review the Four Aspects of Communication model

II. Share name symbols/objects of reference.

III. Ask teachers to share what they're thinking about since In-service I.

IV. Ask teachers to share what they've tried so far, based on the model.

V. Functions:

- A. Early functions of communication
- B. Teacher's typical communication functions
- C. Creating opportunities:
  1. Opportunities for specific functions
  2. Matricing as a tool to create opportunities

VI. Content:

- A. Teacher messages and student messages
- B. Student chosen vocabulary
- C. Teacher chosen vocabulary
- D. Use of parent, peer, and professional surveys
- E. Use of maps and ecological inventories

VII. Context

- A. Physical environment
  1. set up
  2. visual considerations
  3. auditory considerations

B. Individual Needs and Adaptations

1. visual

2. auditory

3. other physical

4. learning characteristics

C. Activities and Routines

1. Activities and routines set the stage for communication

2. The importance of routines
   The connection of anticipation shelves to anticipation and communication

D. Communication Partners

1. Role as model

2. Recognizing child's communication

3. Facilitating peer interactions

4. Creating Opportunities

E. Process of Communication

1. Teaching initiation

2. Teaching children to sustain conversation

3. Teaching appropriate termination of conversation

VIII. Questions

IX: Activity: Complete the first Action Plan

X. Fill out In-service Evaluation

In-service evaluations and evaluation results summary are located in the Appendix .

Information Packet

The following outline details the contents of the information packet that was distributed at the In-service. Participants were provided with a one-inch wide loose leaf and with the information packet content that corresponded to the in-service topics. For

example, participants were provided with the information contained in the Introduction and the Forms sections for the first in-service. The other sections were provided as part of In-service Part II at Site One and as part of In-service Part III at Site Two.

In-service Packet Content

Introduction section:

The Four Aspects of Communication Diagram

Communication: Informal Assessment (Bottorf, & DePape, 1982)

Sequence of Communicative Behavior (Siegel-Causey & Downing, 1987)

Section One: Form

Diagram of Forms: From Concrete to Abstract (Rowland & Schweigert, 1990)

Form Selection Considerations

Who Might Benefit by Using Object Symbols? (Gamradt & Gunderson, 1989)

Object Communication (Fact Sheet, California Deafblind Services)

Tangible Exchange Sequence (Feeley, 1990)

Tangible Langauge Program: Using a Velcro Clipboard (Feeley, 1990)

Natural Gestures

Preparation for Sign Language

Tadoma (Fact Sheet, California Deafblind Services)

Low Tech Applications

A Standard Tactile Symbol System: Graphic Language for Individuals who are Blind and Unable to Learn Braille (Hagood, 1993)

Section II: Function

Early Functions of Communication

Examples of Intents/Functions

Curriculum Matrix by Activity and Function

Curriculum Matrix by I.E.P. Objectives, Activity, and Function

Section III: Content

Ways to Think About Vocabulary

Vocabulary Selection

Identifying Environments

Developing Functional Communication Content

"Wh" Categories

Section IV: Context

Context

A Display of Five Instructional Guidelines in Relation to the Context in Which

> Nonsymbolic Communication Can Be Facilitated For Learners with Severe Disabilities (Siegel-Causey & Guess, 1989)
>
> Strategies to Support Communication Development (Downing, 1990; Downing & Siegel-Cuasey, 1988; Siegel-Causey & Downing, 1987; Siegel-Causey & Ernst, 1989
>
> A Classroom Checklist Environmental Checklist for Students with Dual Sensory Impairments (Rikhye, Gothelf, & Appell, 1989)

Classroom Environment Checklist (Bair, 1996, based on Rikhye et al. article)

Contexts: Identifying Environments

Follow-Up Supports

In addition to the in-services and information packet, on site coaching was provided to the teachers. Follow-up materials were also provided at the teacher's request. The stimulated recall sessions were part of the follow up interventions. The primary purpose of the stimulated recall sessions was to provide the teacher with experiences in guided reflection.

Overview of Data Sources

This overview is provided due to the complexity of the methods and data sources employed. The five data sources for this study were: transcripts of audiotaped interviews, transcripts of videotaped observations, transcripts of audiotaped stimulated recall sessions, written documents known as Action Plans, and researcher field notes. A detailed description of each follows the Procedural Timeline. Descriptions are provided in a roughly chronological order according to when a particular method and its relevant data sources were used in the study, although there is some overlap as indicated in the procedural timeline. Activities cited in the procedural timeline occurred in the order and in the combinations presented below, but the actual timeline varied at each site as stated in the paragraph following the timeline.

Procedural Timeline

Week 1:	Pre-In-service Observation
	Pre-In-service Interview (same day)
Week 3:	In-service Session I
	In-service Evaluation completed
Week 5:	In-service Session II
	In-service Evaluation completed
	Action Plan #1 collected
	Provide teachers with videotape of Pre-In-service videotape
Week 6:	Follow-Up Observation Session I
	Action Plan #2 collected
	Stimulated recall session #1
Week 8:	Follow-Up Observation Session II
	Action Plan #3 collected
	Stimulated recall session #2

Week 10: Follow-Up Observation Session III

Action Plan #4 collected

Stimulated recall session #3

Week 12: Stimulated recall session #4

Exit Interview

Videotapes were provided to the teacher one week prior to the Stimulated Recall Session.

Although the structure of the established activities remained the same, the actual timelines changed after the study began. The Site One building administrator decided that data collection would be suspended for the holiday session from one week prior to Thanksgiving to January 15. This extended the study in Site One to nineteen weeks in length. As mentioned earlier, Site Two staff requested that their in-services be divided into three sessions, instead of two. Holiday break also resulted in a two week delay for Site Two. Therefore, the study required sixteen weeks at Site Two.

Data Collection Procedures

Pre-in-service Observation

Observations were a primary source of information about teacher practice within the context of the teacher's usual daily routine. The teacher's interactions with participant students were observed for a period of two hours for each session, including the pre-in-service observation. The date and time of the observation were chosen by the classroom teacher. All interactions were recorded on videotape by the researcher who used a tripod for some of the filming. The teacher in Site One facilitated the filming by situating the two participant children in close physical proximity whenever it was possible to do so without disturbing the usual routines. This enabled the researcher to "capture" the activities and interactions of both children during the same filming. The researcher was a passive participant observer in the pre-in-service or initial observation. While the teacher and paraprofessionals were aware of the researcher's presence, the

student participants were not, due to the levels of hearing and vision loss and the role of the researcher for this observation. The pre-in-service observation served as a baseline data source of teacher and student communication, prior to any intervention. The researcher's role shifted to active participant observer during the three follow-up observations that followed the in-service series. The complete videotapes were transcribed as described in the Data Coding and Analysis section.

Pre-in-service Interview

The interview method was selected for the purpose of revealing teacher cognitions about communication intervention and instructional practice related to communication intervention concepts. The interviews were selected as a second source of data because the researcher suspected that the teachers might think about a change in instructional practice prior to implementation. Such reflection could not be captured by videotaped observations. Therefore, interviews were a source relevant to learning about teacher thinking.

The pre-in-service interview was done, in person, at the teachers' schools, at the end of the school day, on the same day as the pre-in-service observation. The pre-in-service interview was structured, with a focus on the teacher's understanding of deafblindness and communication. The emphasis of the interview questions was on how the teacher thought about and performed communication intervention with a learner(s) who is/are congenitally deafblind. The interviews lasted approximately one hour and were audiotaped, with the teacher's consent, for subsequent transcription and data analysis.

Pre-In-service Interview Questions

1. What does the term "deafblind" mean to you?
2. How do you think deafblindness affects learning?

3. What does the term "communication" mean to you?

4. What do you think the effects of deafblindness are on communication and language development?

5. Can you describe how the deafblind student in your class currently communicates?

5. How do you think about communication intervention for this student?

Possible probes:
How do you plan?
Do you have a mental model that you can describe?

7. What interventions are you currently using to support this child's communication development?

8. How would you describe the effectiveness of these interventions?

9. When you think about communication intervention for children who are congenitally deafblind, what do you think you would like to learn more about?

10. After gaining access to new ideas and skills, what kinds of supports would you need to put those ideas into practice?

11. When you contemplate the possibility of choosing to make change in some area of your teaching practice, what do you consider?

Action Plans

A written document, called an Action Plan (Figure #6), was developed to collect data for three distinct purposes. Part I of the Action Plan collected information on teacher thinking and practices in relationship to the implementation of new strategies from the Four Aspects of Communication Intervention model. This section revealed when teacher thinking and practice were at different "places." Part II of the Action Plan included a location to record "Current Concerns" and Part III provided teachers with an opportunity to request follow-up supports. This included the following categories of support: written materials, videotapes, a more lengthy stimulated recall session, clarification of ideas and concepts or follow-up coaching. Follow-up coaching connoted "hands-on" support in the teacher's classroom. The researcher followed-up on each of the teacher requests.

Four copies of the Action Plans were provided to each teacher. Teachers were asked to complete an Action Plan at the end of In-service Session II. They were also asked to complete an Action Plan prior to each of the post-in-service observations for a total of four Action Plans. Completed Action Plans were collected by the researcher at the end of each follow-up observation sessions.

Action Plan Form

Teacher's pseudonym:

Date:

Part I

	Form	Function	Content	Context
Thinking/ Planning				
Action Taken				

Part II

Please describe your current concerns about this communication intervention model. Please write each idea on a separate line.

_____

_____

_____

_____

_____

Part III

Follow-Up Requests

I would like you to provide written or videotaped materials on the following:

I would like you to spend additional time in stimulated recall sessions on the following topic(s):

I would like to talk with you or another teacher about the following:

I need clarification of the following ideas:

I would like you to provide follow-up coaching on the following:

Follow-up Observations

The follow-up observations were used to gather information about any changes in teacher practice that could be associated with the interventions, as well as providing the forum for researcher feedback and coaching. The procedure for the follow-up observations was similar to the pre-in-service observation with a couple of exceptions. The most important change occurred as the researcher's role became more active in the follow-up observations. Although the researcher had intended to use an outside photographer for the follow-up observations, both teachers preferred not to have an additional person in the classroom, so a combination of researcher videotaped and tripod facilitated videotaping was used. The use of the tripod allowed the researcher to be "freed up" to interact with children and staff. This was necessary to allow for the possibility of researcher-teacher interactions, demonstration, and modeling. The researcher's role shifted to active participant observer as she modeled and provided coaching per teacher request. Such requests were made either through the written Action Plan or during the on-site observations. The teacher chose which elements of the model to implement. The researcher's role, as coach, was driven by the teacher's needs and requests and was intended to support her implementation of the model, as determined by

the teacher's professional choices. Teachers were able to ask the researcher for clarification of ideas or for demonstration, which became part of the observation follow-up, as well as the provision of feedback on teaching practice.

Stimulated Recall Sessions

The process of stimulated recall (Clark & Peterson, 1986) was used to learn more about teachers thought processes during instructional activities. Because it was possible that teacher thinking might precede a change in teacher behavior, the stimulated recall sessions were designed to capture teacher thought, specifically their reflections about their own practices and the practices of others in the classroom setting. The stimulated recall sessions occurred after school, on the same days as the follow-up observations. Each of the four sessions lasted no more than 30 minutes. The teacher and researcher reviewed approximately 20 minutes of videotape from the previous observation period. The researcher provided the teacher with a copy of the videotape of the previous observation one-week prior to its review during stimulated recall sessions. The teacher was asked to select a 10-minute instructional sequence prior to arriving for the stimulated recall session. The researcher also chose a ten minute instructional sequence, prior to the sessions. On one occasion, in each site, the researcher and teacher selected the same, or nearly the same 10-minute segment. During the stimulated recall sessions, the teacher and researcher viewed the two videotape segments together while the researcher posed questions to stimulate the teacher's recall of events and the thinking behind her actions. Questions included the following: What were you doing here? What was your objective? Why? Which aspect of communication does this address? What did you notice about (student name)? Was that strategy easy or difficult to use? Stimulated recall sessions were audiotaped for later transcription and analysis. Ample use of pause created opportunities for teachers to initiate conversations that were different from the structure manipulated by researcher comments and questions.

Exit Interview

The exit interview was semi-formal, with a focus on how the teacher thought about and performed communication intervention with a learner who is congenitally deafblind. The exit interview was completed within one week after the third and final observation period. The exit interview contained questions directed at collecting data on the teacher's concerns about the innovation, as well as teacher's instructional choices. The effect of the teacher's practice on student learning was addressed in the exit interview. Teachers had the opportunity to generate discussion that was not structured as part of the established questions. The exit interview was audiotaped for subsequent transcription and analysis.

Exit Interview Questions

1. How would you describe your thinking about communication intervention for children who are congenitally deafblind?

   Possible probes:
   What are some of the important features to think about?
   Could you list or draw your mental model?

2. Can you describe your current concerns about the intervention model we learned about?

   Possible probe:
   Present teacher with the list of concerns as expressed in her Action Plans.

3. I've noticed from your Action Plans and from the observations that you have chosen to implement interventions under aspect_____.

   Why did you start there?

   Possible probe:
   You also implemented strategies under aspect _____. I'm wondering why that was your next step.

4. What parts of the model do you think are most useful to your work with student _____?

5. Which aspect(s) of the model are easiest to implement?

6. Which aspect(s) are most difficult to implement?

7. Which of the follow-up supports were most helpful to your implementation?

   Possible probe:
   List the supports: opportunities to talk about ideas, review and discussion of your teaching videotapes, in class follow up coaching, written action plans?

8. What, if any, influence did the interventions you tried have on student name's communication?

9. What is your plan for the use of this model in the future with student name?

10. Have you made any improvements on the model?

11. Can you continue to implement this intervention independently?

12. Will you collaborate with other teachers?

12. What supports do you need to continue in your implementation of this model?

Field Notes

In addition to the videotaped transcripts, field notes were taken to account for details that weren't captured on the videotape and for ease of organization. Merriam (1988) suggested particular elements to note when performing observation research. These guidelines were used to identify those same elements in videotape review and were also recorded on site using pencil and paper. The suggested data included: date, time, changes in the physical setting, people other than study participants in the teaching environment, and activities. The researcher also noted concerns about communication intervention for each site. These particular notations were used to guide the researcher in her coaching.

Data Coding and Analysis

The modified analytic induction approach was used to analyze all data sources. (Bogdan & Biklen, 1992). The following methods were used in data collection, as discussed above: observations, interviews, written in-service evaluations, stimulated

recall sessions and action plans. The theoretical bases for this study were the four aspects of communication, form, function, content and context and Hall, et al. (1973) "Stages of Concern about the Innovation model." Therefore form, function, content, context, in combination with the six stages of concern as detailed by Hall et al. formed the established categories for data coding and analysis. Additional categories were developed as themes emerged.

The coding process was eased by using abbreviated teacher and student codes. A "T" was used to represent teachers. The teacher in Site One was designated as "T1." The teacher in Site Two was designated as "T2." The teacher consultant in Site two who worked directly with the participant student, was designated, "T3." A "P" was used to represent paraprofessionals. The two paraprofessionals in Site One were designated as "P1" and "P2." The paraprofessional in Site Two was designated as "P3." Students were represented by an "S," resulting in designations of "S1," "S2," for the two students in Site One and S3 for the student in Site Two. Later, pseudonyms were assigned as the script developed, for ease of reading. The Site One teacher was assigned the name of "Marty." The paraprofessionals in Site One were named "Bea" and "Carly." The student participants in Site One were "Ron" and Susie." The Site Two teacher was assigned the name, "Karen." The paraprofessional in Site Two was given the pseudonym of "Joan," while the Speech and Language teacher became known as "Shirley." The participant child in Site Two was assigned the name, "Calvin." These pseudonyms are depicted below.

Assigned Codings and Pseudonyms

	Coding	Pseudonym
Site One:		
Teacher One:	T1	Marty
Paraprofessional One:	P1	Bea
Paraprofessional Two:	P2	Carly
Student One:	S1	Ron
Student Two:	S2	Susie
Site Two:		
Teacher Two	T2	Karen
Teacher Consultant	T3	Shirley
Paraprofessional Three	P3	Joan
Student Three	S3	Calvin

Observations

The videotapes of each teacher's pre-in-service and three follow-up observations were transcribed, leaving a space for every fifteen-second pause to indicate the termination of an interaction. The transcribed narrative was read once through without any coding to gain a general view of the observation. During the second reading, contextual features recorded on-site during the observation, in paper and pencil, were added as descriptions to the videotape transcript. These items were added in italics. During the third reading, the form and functions of communication were coded for each teacher and student message. The initiator of each interaction, who already been indicated by the presence of spaces in the transcript, were highlighted to support ease of identification. The fourth reading was done to look for possible patterns and emerging themes based on the messages or content itself. As themes developed, additional readings were required to account for each message.

The following coding notation was developed for the aspect of form. Codings that emerged during the study are indicated. Note that sign is differentiated from verbal, although sign language is a verbal form. Since children at the presymbolic to early symbolic level of communication were defined to express utterances of no more than two words, the term "sign" was used to denote the use of signs, not to denote "sign language" on the part of the students. The term "verbal" was used to denote spoken words. Forms of communication were coded as listed below.

Coding Forms of Communication

BL:	Body language or facial expression
O:	Object
PO:	Partial Objects
T:	Textures
G:	Gesture
P:	Pictures
VO:	Vocalization
VE:	Verbalization. This was in child's voice.
VE/AAC:	Verbalization through augmentative communication device
S:	Sign

The additional notation of "CO" was used to designate coactive communication and was an emerging theme. This designation was used when the teacher and child expressed together. It was combined with body language to be represented as "B/CO," coactive body language and with sign to be represented as "S/CO." This concept of coactive communication is critical to learners who are deafblind because they are often dependent on tactile communication.

The eleven early functions or purposes of communication, as established prior to data collection, were coded as listed below.

Coding Functions of Communication

P:	Protest
C:	Calling
SO:	Showing object
GO:	Gives object
A:	Answering
L:	Labeling
RO:	Request object
RA:	Request Action
CA:	Comment Action
CO:	Comment on Object
G:	Greeting

The following additional functions emerged as all of the data didn't "fit" within the established early functions. Many of these functions emerged because adult expressive communication wasn't limited to the early functions of communication.

AF:	Affection
AO:	Accepting object
A/PA:	Answering through Physical Action
A/V:	Answer/verifying. Adult repeated child's response to verify.
CE:	Choice
CH:	Comment on what was heard
D:	Directive
PA:	Physical Actions. An intent to communicate may have been inferred.
Q:	Question
DQ:	Directive Question (implied directive in question format)
QR:	Question, repeated
Q/V:	Question to verify
RQ:	Rhetorical questions
U:	Unknown

It is important to note while all forms could be coded, the functions or purposes of some student communication couldn't be identified. These occasions were coded, "unknown," as were any messages that were inaudible on the videotapes. It is also noteworthy that teachers often expressed messages for more than one function. The following examples illustrate this phenomena:

P3: "You don't want to do this (an interpretation of the child's body language)? There's a cracker inside."

This was coded as: P3-VE:CA/Q/I. This coding represents that paraprofessional three, Joan, expressed this message in the verbal form for the functions of commenting on the student's actions, asking a question, and informing. A second example follows:

> T1: "Are you ready to get started? Did Bea crack you up? She cracks all of us up. (The teacher rubs student's arm affectionately)."

This was coded as T1-VE/B:Q/Q/I/AF. Teacher One, Marty, expressed this message in the verbal form for the functions of asking two different questions, one in immediate succession to the other, followed by informing the student, and finally expressing affection. All of these purposes were completed prior to any student response.

Analysis included a count of the total number of interactions between the teacher and the student for each observation period. The total number of teacher initiations and student initiations were calculated by a simple count. Coding of teacher's forms of communication and student's forms of communication were analyzed for emerging themes such as possible mismatches between teacher and student forms. Coding of teacher and student functions were tallied to inform about the purposes of the teacher's communications and the purposes of the students' communications, as well as to examine teacher modeling of various functions. Content was analyzed for emerging themes by examining the nature and frequency of specific messages of both the teachers and the students. Contextual features, noted during the actual observation and during the transcription of the videotape were examined for possible emerging themes while using the five components of context: physical environment, individual's needs and adaptations, activity and routine, communication partners, and process of communication as an a priori structure.

Interview

Audiotapes from both the pre-in-service and exit interview were transcribed in their entirety. Two copies of each transcript were made. The first copy displayed each teacher's interview responses. The second copy was organized on the computer (using

copy and paste) to show both teachers' response to each of the questions. This procedure was followed for both the pre-in-service and exit interviews. The first set of interviews were read and examined for possible themes for each teacher. The second set of data, which was a collation of all teacher responses per question, was examined for possible emerging themes that were shared by the two teachers or that differentiated the teachers. Teacher responses were examined for themes concerning their thinking and practice in communication intervention across the four aspects of communication. Responses were also examined for themes that related to teacher's concerns. An example of two responses that demonstrate a common theme follows:

Question:	"What do you think the effects of deafblindness are on communication and language development?"
T1 Response:	"...There is no natural development of language and communication for a deafblind child, especially one with mental impairment."
T2 Response:	"I guess my first thought is that it affects it because they don't learn anything naturally. Everything has to be taught to them."

Action Plans

Each Action Plan had three parts requiring different coding and analysis procedures. In Part I, the teacher recorded thinking and action related to communication intervention. Since Part I of the Action Plan was already organized using the Four Aspects of Communication, form, function, content, and context became the themes within which data was organized. These records were examined for possible themes, such as a sequence of requests for an individual teacher over time or commonalties among the two teachers.

The second part of the Action Plan was an open-ended question about teacher's concerns about the communication intervention model. The teacher recorded her concerns, one per line provided, to allow for ease of coding. Each line was assigned a

number, 0-6 to represent the 7 levels of concern about the innovation, as developed by Hall et al. (1973). The coding follows:

Stages of Concern About the Innovation

0=awareness. There is little concern about the innovation.

1=informational. Teacher is gaining knowledge about the general characteristics of the innovation, its effects and requirements.

2=personal. Focus is on personal concerns, such as personal rewards, costs, organizational issues, and status concerns.

3=management. Teacher is focused on how to use the innovation-efficiency, organization, management, scheduling of time.

4=consequence. Concern about impact of innovation on students-relevance to Outcomes and evaluation.

5=collaboration. With others using innovation to better meet student needs.

6=refocusing. Focus is on broader benefits of innovation or ways of changing innovation to improve it. (Loucks-Horsely & Stiegelbauer, 1991, p. 20).

For example, in Action Plan #2, Marty recorded the following concerns:

3 Line #1: Encouraging follow through with staff and home.

1 Line #2: Individualizing tangible symbols.

1 Line #3: Implementing individualized tangibles effectively.

3 Line #4: Time Constraints

3 Line #5: Unsupportive administration.

Coding is provided to the left of the concern.

Analysis of Part II included an examination of the coding for possible patterns in each teacher's responses over time, and for common patterns among the teachers.

Part III of the Action Plan provided teachers with a space to request follow-up support. These requests were coded according to the following categories:

Written materials

Videotaped materials

Additional stimulated

Clarification of concepts

Discussion about implementation

Follow-up coaching in classroom

The codings were analyzed for patterns of request per teacher and patterns of request among all three teachers.

Stimulated Recall

The audiotapes were transcribed by the researcher. Transcripts were read twice, prior to the search for possible categories. During the third reading, teacher comments about thinking and practice were coded using the following categories: form, function, content, and context, and the seven levels of concerns about the model as defined by Hall et al. (1973). A fourth and fifth reading were done to search for possible themes that were not accounted for by the preceding categories. The transcript was read until all of the teacher's thinking about their practice, as depicted on the videotaped instructional sequence, had been explained by the proposed and emerging categories.

Analysis of the stimulated recall session scripts involved examination of the coding and samples of teacher's actual comments to develop a description of how each teacher thought about her practice as shown on the videotape. Again, the four aspects of communication formed the initial categories, while additional themes emerged through analysis. These codings and descriptions were examined for possible themes and patterns among the three teachers.

In coding the data, the importance of teacher initiated versus researcher initiated conversations emerged. The purpose of the stimulated recall sessions was two fold. First, the intent was to provide feedback to the teachers and second, to collect data on how teachers thought about their own observed practice. It became crucial to differentiate teacher thoughts expressed as a result of researcher questions or probes from teacher initiated discussions. For example, in the context of discussing the different

classroom noise levels and how the absence of a particular student impacted the teacher, the following discussion ensued:

> T2: "Another thing he's using a lot more is, no. He's shaking his head a lot more which is more, I mean, you know what he's saying. Before it was Yah, or Yah, yah. I could not tell."

This was a teacher-initiated conversation that was coded as being on the topics of content and form. An example of a researcher initiated conversation on the topics of communication partners, a component of the aspect of context, follows:

> RE: "I think what's important about that one (tape sequence) is communication partners and really looking at what Joan provided. So what would you say about Joan's contribution to that sequence?"
>
> T2: "Well, just to start. I noticed how comfortable he is. Their proximity. How she has her arms around him and there's a lot of comfort. I think they both feel comfortable working together, being together, laughing a lot. He's willing to work for her."

An unexpected theme emerged through the analysis of the stimulated recall session. This was the only data source in which the teachers "became" the voice of the student. This phenomena went beyond the mere interpretation of body language, to actually voicing what was apparent to the teacher, through the child's body language or vocalization. The teacher literally verbalized what she thought the child would verbalize, if able, assuming a voice that was different in pitch than her own. The researcher identified this an emerging theme and named it, "giving voice." An example follows:

> The context: T1 and RE were viewing an observation tape during a Stimulated Recall session. Susie had tossed a portable piano off the table during a period of waiting.
>
> T1: "There it goes (in her voice)." " Nobody's paying attention to me" (giving the student voice.)

In the last Stimulated Recall session the same teacher interpreted the body movements of Susie in the following example of giving voice:

> T1: "If I can get my wrist up there, I can...(spoken in a strained voice)"

Triangulation of Data

The data drawn from the five data sources was triangulated in response to each research question. First, the data from each source was analyzed to determine its relevance to each of the three research questions. In some cases, such as the post in-service interview, parts of the source were relevant to more than one question. Next, all the data relevant to the first research question was grouped under that question on the computer. The same procedure was followed for the second and third question. When data was relevant to more than one question, the copy feature was used on the computer. The three research questions served as organizational headings, while the data sources were used as sub headings. The pre-in-service interview, pre-in-service observation, and pre-in-service field notes were all data sources relevant to the first research question. The post-in-service interview, follow-up observations, written Action Plans and researcher field notes were all relevant data source to answering the second research question. The pre-in-service interview, post interview, written Action Plans, stimulated recall session, and field notes were all relevant data sources to the third research question. After examining all the data and organizing all the data relevant to each research question, the various sources were examined for how they informed each of the research questions in ways that were similar and dissimilar. These similarities and differences are discussed in Chapter Four.

Confidentiality

All collected data was coded with identification letters and numbers. Later, the researcher invented pseudonyms for each participant for ease of analysis, as previously explained. Due to the small number of participants, the researcher was able to associate the data with individual subject codes or pseudonyms. At no time were individual teacher, student, or district names used in order to guarantee confidentiality. Reports of research findings will not associate particular subjects with specific responses or findings.

The full names of forms and functions will be used to ease the burden of the reader in the following chapters. Pseudonyms for teachers, students and paraprofessionals will also be used.

CHAPTER FOUR

RESULTS AND DISCUSSION

This study examined the following three research questions: What are teacher's communication intervention models and practices for children who are congenitally deafblind? How will teachers' communication intervention models and practices change as a result of an in-service with collaborative follow-up coaching approach utilizing the Four Aspects of Communication model for communication intervention? What supports do teachers need to integrate the Four Aspects of Communication intervention model into daily practice? Scripts of videotaped observations, scripts of stimulated recall sessions, written Action Plans, pre and post interviews, and researcher field notes served as the five data sources.

Research Question #1: What are teachers' communication intervention models and practices for children who are congenitally deafblind?

The Pre-In-service interview, Pre-In-service Observation and Pre-In-service Field Notes were the three data sources relevant to answering Research Question #1. The data for each of these sources was collected prior to the in-service series. Pre-In-service Interview data were structured by the questions posed, while all data drawn from Pre-In-service Observation transcripts and Pre-In-service Observation Field Notes were organized within the structure of the four aspects of communication: form, function, content, and context.

Pre-In-service Interview Data: Site #1

Teacher #1, Marty viewed communication as largely an expressive process. When asked, "What does the term communication mean to you" she responded,

> Ah-communication is a broad term. I think a child who can express, or anyone who can express their wants and need in anyway that it, you know, that another person can understand what they want and need, that's communication.

Her response reflects her focus on expressive communication.

Marty understood the effect of congenital deafblindness on communication development. She also understood the important role that incidental learning plays in the development of communication and language as demonstrated in the following remark, "The language development has to be supplemented. There is no natural development of language and communication for a deafblind child, especially ones with mental impairments as well."

When asked to describe how the participant children, Ron and Susie, currently communicated, Marty responded by discussing only forms of communication. She shared the names of the augmentative communication devices (AAC) utilized by the students and also mentioned that they were using gesture and simple sign. The participant children were using following augmentative communication devices: Big Mac and Whisper Wolf. In addition, there was a Linx device in the room, but it was not currently being used by any of the students. She said nothing about the kinds of functions or content (messages) the children communicated.

Communication intervention was clearly a priority for Marty, but she viewed it almost entirely in terms of forms of communication. When asked to describe her thinking about communication intervention, she responded,

> We look for help everywhere. Being able to communicate is a priority. It should be a priority for everyone and if you don't have a form of communication then you end up being very frustrated and that's when the behaviors that you see with the severely impaired and the deafblind, the biting and the acting out behaviors and the tantruming. I think it's because they don't have a way to tell you what they want and need, you know....So, without some form of communication, they kind of are sitting in limbo waiting for someone to give them what they want. It's kind of hard without some kind of tangible or sign or verbal communication that they, you're guessing. You spend more time guessing than anything else. So, it's, communication intervention, is imperative.

When asked to describe her current interventions, she again spoke about forms of communications.

> I think we use a variety of methods to communicate what we're trying to do, not just talking, but using the Wolf or using the Big Mac (AAC devices) or giving cues or gestures, being close to the kids. ....All sorts of switch interfaces....We're trying to get him to use a functional communication system, functional for him and functional for us and we're trying to curb, we're hoping that by giving him a way to communicate, we'll reduce his self behaviors, his self injurious behaviors, his self stim.

Marty understood the importance of having ways or forms to communicate and how the provision of appropriate forms can result in the reduction of inappropriate behaviors. Marty also spoke about the need to reinforce Susie's hearing through the use of a switch interface to be installed on the classroom computer. When asked what had been most successful so far, she was unable to list any specific communication intervention strategies, but did report that the families saw some progress in student learning.

Consistency was important to Marty's thinking about communication intervention and she understood that consistency was, in part, dependent on her ability to train the paraprofessionals in specific instructional strategies. She also understood the importance of consistency, across environments, as a feature of appropriate programming for children who are deafblind. Marty discussed her efforts to establish consistency by training or explaining the strategies to the paraprofessionals, Bea and Carly. She also shared her efforts to coordinate instructional approaches between the daily residential staff and the parents who had their children home for weekends. The fact that the study children in Marty's room lived in two different environments increased the demands of collaboration on the classroom teacher.

When asked what she would like to learn more about, in terms of communication intervention, Marty expressed her frustration with some recently received negative feedback and then went on to say:

> I don't know the steps (developmental) of deafblind. But with nine kids and five ambulatory and only two paraprofessionals it gets kind of crazy in there. I would like to run a full communication program because I don't think there's anything more important than communication. Unfortunately I don't have enough arms or enough experience with deafblind communication.....even after five years (of teaching experience), I can't say I have the experience to say, " this is how we're going to do it.

Marty understood how the context of her classroom and her lack of knowledge and skills about deafblindness interfered with her ability to achieve her communication intervention goals. Another consultant had recently informed Marty, that her developmental, prerequisite approach wouldn't work for her deafblind students. Her entire approach to instruction was now in question and she felt somewhat helpless. She didn't know what to request in terms of further training. So, communication intervention for deafblind children was somewhat overwhelming for Marty. She was very knowledgeable about augmentative communication devices. Therefore, it was comfortable for her to begin by thinking about communication forms.

Pre-In-service Interview: Site 2

When asked, "What does the term communication mean to you," Karen demonstrated that she understood that communication included both expressive and receptive considerations.

> Communication means being able to express your thoughts express your ideas, express your feelings, to be able to receive new information whether it be through auditory, through visual, through touch and really just the sharing of ideas, thoughts, and feelings between people or it could be between animals.

Her response also demonstrated her understanding that communication occurs between two people.

Karen understood the connection between deafblindness and the lack of incidental learning. She also understood the importance of experiential learning and direct teaching. Karen viewed deafblindness as the addition of blindness to deafness, as demonstrated in the following response to the question, "What do you think the effects of deafblindness are on communication and language development?

> I guess my first thought is that it affects it because they don't learn anything naturally. Everything has to be taught to them. They are not going to pick up things on the radio or t.v., through their parents and their siblings unless they're directly taught. Then when you put blindness on top of it, it has to be even more directly taught. Because I know that language is developed, mainly learned through audition and listening to your surroundings. You add the blindness to it and all those experiences that we get visually are also impacted. So, I guess you

> have to make those experiences, you have to make even more experiences for the child who is deafblind.

Karen's description of deafblindness as the addition of blindness to deafness may be the result of her previous experience with a child with Usher Syndrome or simply her perspective as an educator of deaf children.

When asked to describe how the participant child, Calvin communicated, Karen responded by describing elements of both form, content, and instructional strategies as exemplified in the following excerpt:

> He communicates by shaking his head, that means no. He often can communicate when given choices. He can make a choice. For me, I find it hard to understand his choices. You know, I try to give him one syllable versus two syllable choices. He doesn't seem real consistent with it.

Karen shared her difficulty in understanding Calvin's expressive language. This involved some risk taking on her part as she was a teacher in a deaf education program using an auditory/oral language approach. Karen wasn't certain if her inability to comprehend Calvin's speech was due to her lack of familiarity with him or if his speech truly was unintelligible.

Karen described her communication interventions as including the presentation of choices in one or two syllables verbalized language. Staff would present Calvin with two choices, one in a one-syllable format and the other in a two-syllable format. Calvin would then make a one or two syllable utterance. Staff interpreted that as being the choice for the word with the corresponding number of syllables. Karen briefly mentioned the importance of providing him with simple directions. She felt it was important to use the language he understood.

When asked how she coordinated planning and communication intervention with her paraprofessional, Karen revealed her reliance on the paraprofessional.

> I don't feel that I really understand Calvin very well. I find it real hard to work with him, with the rest of the group. More or less, Joan is working with him most
>
> of the day. I try to tell her what we're doing as a group, so that if we're working on seasons, she has summer clothes out and winter clothes out. So she can work with him on those things. More or less when we do our planning it's not so much for communication planning as it is trying to meet his goals, trying to figure out which goals are most important to him, whether it be bathrooming or eating or pre-braille kinds of things.

Karen's response revealed her sense of being overwhelmed and her uncertainty regarding what to offer Calvin.

When asked if she had a mental model for communication intervention, she responded, "I do with the other kids. With Calvin, again, I think I'm so overwhelmed." However, with a further probe about her interventions, she shared the following:

> Been working on letter sounds and trying to put some letter sounds together that he can produce. You know, finding out first of all what letter sounds he has. He has several letter sounds that he can do in isolation but he can't necessarily put them into word form. But I figured if I know at least what letter sounds he can physically form with his mouth and if it's in the initial or final position, then we can start working on some words. That would work for him.

So, even though Karen was dissatisfied with the intelligibility of Calvin's speech and knew that he had received nine years of intensive intervention in the oral program, she approached intervention by using what she knew about facilitating speech.

When asked about what had been the most successful communication intervention strategies, Karen responded, "I don't think I could rank anything right now. Nothing feels real successful. Nothing. I don't think I've worked hard enough on anything to say that anything has been successful." Although Karen had known Calvin for his nine years in the deaf education program, this was her first year as his teacher and she had less than three months of direct experience with him. She did have the consultant services of several others who had worked with him since he enrolled in the program, nine years earlier.

When asked what she would like to learn more about, in terms of communication intervention, Karen responded:

> I'd like to learn more about, I'd like to see what other students are doing. Calvin is the only experience I've had. I'd like to see if they communicate manually with their hands or doing auditory/oral kinds of things. How they're functioning receptively and expressively. You know, what's worked for other people that might work for Calvin. What kinds of things haven't we tried? I know Shirley (the Speech and Language teacher) has tried many different things. What are realistic expectations? I don't know if anyone can tell us. Why are we trying this? Is there a hierarchy of skills, maybe we could start where he is.

In this response, Karen first exposed her uncertainty about the oral approach to communication for Calvin. Again, she revealed her concern with both expressive and receptive communication and made a connection to the use of forms. She was uncertain about what appropriate intervention would include. Karen wanted to connect instruction to some kind of understanding about where he was currently functioning. So, Karen was aware that her first step was to assess and understand more about Calvin's present performance level.

Summary of Data Source 1: Pre-In-service Interview

The Pre-In-service Interview revealed that while Marty viewed communication for the participant children in terms of expression, Karen was thinking actively about both the expressive and receptive components. Both teachers were aware that congenital deafblindness interfered with a child's ability to learn incidentally and that observation was not the basis for language acquisition as it is for hearing and sighted children. Marty was particularly cognizant of the importance of programming consistency to the success of children who are congenitally deafblind. Both teachers approached communication intervention from a point of familiarity. Marty was quite knowledgeable about forms of communication and was especially informed about technology. Her interventions focused on forms. Karen had been educated in the oral deaf education approach and had gained all of her teaching experience in an oral program. Her initial approaches to intervention with Calvin, centered on using what she knew from her own educational background. Both teachers expressed that they were overwhelmed and uncertain about

how to proceed with communication intervention, though Marty thought it would help if she could understand the unique sequence of development of deafblind children that she had been informed about. Karen believed that knowing what other children were doing, case studies, would be useful to her thinking. Both teachers expressed a condition cited by Fullan (1991) as necessary to change in instructional practice, dissatisfaction with current status of communication programming.

Pre-Observation Data: Site #1

The transcript of the pre-observation period revealed Marty's communication intervention practices with Student One, Ron and Student Two, Susie. The Four Aspects of Communication model was used to organize the data about Marty's interactions with participant children.

Forms of communication. Table #1 depicts the total number of messages expressed by Marty to Ron and the forms in which those messages were expressed. Table #2 displays the total number of expressive messages communicated by Ron to Marty and the forms in which those messages were sent.

Table #1: Marty's Expressive Forms With Ron

Pre-In-service Observation		
Body Language		22
Body Language/Vocalization		1
Body Language/Verbal	10	
Coactive Sign/Verbal	1	
Verbal (spoken)	25	
Total Messages	59	

Table #2: Ron's Expressive Forms with Marty

Pre-In-service Observation	
Body Language	35
Vocalization	2
Total Messages	37

Marty used a variety of forms of communication when communicating with Ron, but only combined verbal with other forms occasionally, even though Ron was profoundly deaf. Ron had no identified functional hearing. Therefore, twenty-five of Marty's fifty-nine expressive messages were probably inaccessible to him. Twenty-six of the teacher's messages represented initiations of distinct interactions with Ron. No specific touch cues were used during the pre-observation session. No tangibles were used. By comparison, Ron expressed thirty-seven messages. He initiated eight conversations that were accessible to Marty, and all of his initiations and responses were at the body language level.

Table #3 depicts the frequency and forms of Marty's expressive messages when she was communicating with Susie, while Table #4 displays the same features for Susie's expressive communication with Marty.

Table #3: Marty's Expressive Forms with Susie

Pre-In-service Observation			
Body Language	9		
Body Language/Verbal		4	
Coactive Sign		1	
Verbal (spoken)		9	
Total Messages			23

Table #4: Susie's Expressive Forms with Marty

Pre-In-service Observation			
Body Language:	6		
Body Language/Vocalizations		3	
Vocalization		16	
Verbal		1	
Total Messages			26

Marty used a variety of communication forms with Susie as well. Marty initiated fifteen interactions with Susie. She expressed equally in body language alone and in verbal alone. The teacher's verbalizations were accessible to Susie. While Susie initiated only

one interaction directly to the teacher, she initiated a total of eighteen that provided the opportunity for anyone to respond, including the teacher. Several of her attempts were unanswered vocalizations for attention. Susie used vocalization and body language as her primary forms of communication. She verbalized "ma" once. She also exhibited a meaningful head nod on two occasions in response to staff questions, although she didn't consistently answer yes or no questions.

The teacher was more likely to interact with Ron than with Susie. She identified herself as Ron's preferred person and the program had been designed so that she delivered most of Ron's instruction. Ron was more dependent on others to initiate conversation with him, whereas Susie initiated more conversations with staff than they did with her. Susie's ability to hear the location of staff was critical to her knowledge about their proximity and her motivation to call them into her space for interaction.

Functions of communication. The categorization of functions was complicated by the fact that the adults in the study communicated for many functions, extending beyond the early functions. It was further complicated by the fact that the adults often communicated a particular function only once. In addition, adults frequently combined three to four functions in one communication without pause for student response. Therefore, the number of different functions will be presented and only those functions that were expressed by participants, on at least four occasions, will be discussed. The tables will reflect functions shared by the teachers and the participant children. When adults did not express specific early functions of communication, there was an impact on the children who lacked opportunities to observe adults modeling the functions they were most likely to develop. Early functions, not expressed by adult models are also discussed. The following tables display Marty's and Ron's functions of communication during the Pre-In-service Observation.

Table #5: Marty's Functions with Ron

Pre-In-service Observation	
Physical Action	14
Comment on Action	13
Directives	4
Physical Affection	4

Table #6: Ron's Functions with Marty

Pre-In-service Observation	
Physical Action	10
Answer through Physical Action	4
Physical Cooperation	7

The teacher, Marty, used twenty-two different functions or combinations of functions of communication in the pre-in-service observation session, but demonstrated no examples of the functions of labeling or greeting when interacting with Ron. The teacher's most frequent function of interaction was to physically acting upon Ron (fourteen occurrences). Marty also exhibited thirteen examples of commenting on action. Most of these occurrences involved reinforcement of student performance. There were also four examples, each, of directives and physical expressions of affection in body language alone, in the pre-observation tape. Ron's expressive and receptive language was demonstrated through body language for the functions of performing a physical action to initiate an interaction, or as a physical response to the teacher's initiation.

Tables 7 and 8 depict the functions of communication displayed by Marty and Susie during the Pre-In-service Observation.

Table #7: Marty's Functions with Susie

Pre-In-service Observation	
Physical Action	8

Table #8: Susie's Functions with Marty

Pre-In-service Observation

Physical Cooperation	5
Comment on Action	6
Calling	9

Marty exhibited twelve different functions or combinations of functions of communication in her interactions with Susie, although no examples of greeting, labeling or protest were observed. The teacher's most common function of interaction or communication with Susie, were physical actions to assist Susie, with eight of her twenty-two interactions being for that purpose. All of the other functions occurred only once or twice in this observation. By contrast, Susie's primary function of communication was to call people into her physical space through vocalizations or vocalizations combined with body language. In addition to the calling, she exhibited six instances of commenting on actions. Each of these circumstances involved her response to adults who were physically assisting her.

Given the physical needs of both participant children, it would be sensible to expect that the teacher would engage with the children, at a physical level of interaction. This was observed to be common. Often such interactions involved caretaking or physical assistance, which evoked a communicative reaction from the child. Since both children had ways of protesting that were recognizable and interpretable to others, the teacher didn't need to model the function of protest. Greeting and labeling were important functions for the teacher to model, but were not observed during this session. It is very possible that the teacher demonstrated such functions at other times or on other days. Labeling is important to the development of new concepts and for the review of old. It connects to the child's ability to build a vocabulary. Children who are congenitally deafblind are dependent on the teacher to provide such modeling. They are also dependent on the teacher to create opportunities for the acquisition of new concepts. Greeting is always problematic for children who are deafblind. The loss of both distance

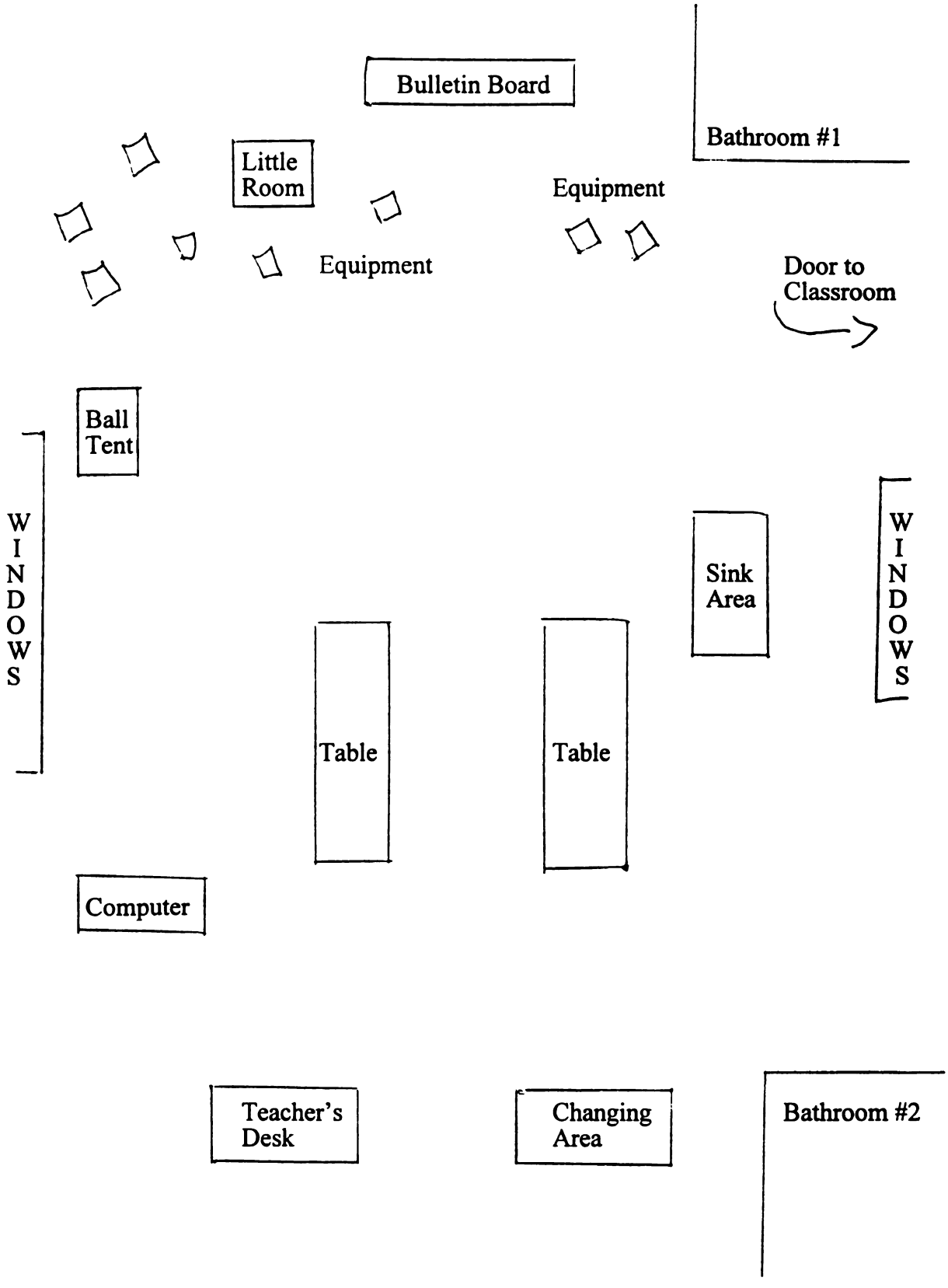
senses presents some obvious obstacles, such as simply hearing or seeing others enter into your near space. The problem of knowing when a potential communication partner is present is recognized in the literature (Mar & Sal, 1995; Rowland & Schweigert, 1993).

Content. The children in Site One often expressed messages in response to the physical actions of adults, such as a response to being moved to the rhythm of music. The teacher, Marty, initiated coactive sign twice, once to communicate the message, "work," and a second to communicate the message, "finished." Ron's messages were expressed in the form of body language, but Susie consistently used the vocalization, "Ah" to gain attention and "Mmm" to express protest. She also verbalized "Ma" in recognition of a caregiver. In addition to her use of vocalization to gain attention (calling), Susie also engaged in vigorous, repetitive, head nodding to gain attention.

Context. The discussion of context includes consideration of the five components of context: physical environment; individual's characteristics; activity and routine; communication partners; and the process of communication.

The physical environment, in the pre-in-service observation period, was a large classroom of nine children, all blind with additional disabilities. The room had three full-time staff, one teacher (Marty), and two paraprofessionals (Bea and Carly). The physical layout of the classroom is detailed in Figure #2. Group instruction took place in the area in front of the bulletin board. Equipment was also kept there, requiring staff to shift equipment around prior to group time. The room included two large tables, neither one of which was wheelchair accessible. The students in wheelchairs used trays. The changing area was located in an area where privacy could be insured. The classroom had two bathrooms, one at each end of the room. A computer was available for use by primarily one student who was not a study participant.

Figure #2: Site One Classroom Diagram



In addition to the regular classroom staff, an additional staff came in to help with lunch. All of the children required tactile approaches, which necessitated many 1:1 interactions with the teacher, paraprofessionals and other staff. All of the children had some level of inappropriate behavior. A few wandered about the room, a few acted out by screaming or hitting when gratification was delayed or whenever a demand was placed on them, including a consistent protest to the request to sit, in one case. This often created a hectic, noisy, and stressful environment. The functioning level of the children was varied, with one child lacking any deliberate movement while others were capable of engaging in conversation and early literacy experiences. The classroom composition was at the parents' request. The children in the room all lived together in the same residential setting during the week and returned to their family homes for weekends. They knew each other and it was the parents' preference that all of them be grouped in one room.

The pre-in-service observation tape and script revealed that Marty was very aware of Ron's individual characteristics, including his need for control. Ron demonstrated a limited willingness to respond to directives. The teacher made use of pause, as well as extensive use of invitation and choices. She understood the importance of turn taking to communication and utilized turn taking in games at a body language level with Ron. She assisted Ron in ambulation. He was able to walk holding only one of her hands.

Susie exhibited a lot of attention getting (calling) messages and didn't have a strong preference for one primary caregiver or preferred person. She was observed to laugh at humorous moments, although she was not wearing a hearing aid or using an FM system (though an FM system had been recommended). The teacher shared that Susie did not like her hearing aids and that Ron pulled at the teacher's FM system, so no amplification was being used, although Susie's hearing loss was in the moderate range. Susie's parents were not willing to push the issue of amplification, reported the teacher. Susie had cerebral palsy, specifically, spastic quadriplegia. She was most able to control the movement of her right arm/hand and head. She rarely moved her legs, except when in

the "Little Room." The Little Room was conceptualized by Lillie Nielson and is a box approximately three-foot square with suspended toys. The purpose of the Little Room is to provide a physically and emotionally safe environment in which a child can initiate with objects and explore. This is one instructional activity used as part of a broader approach developed by Nielson for children who need tasks provided at their level of emotional development (Nielsen, L., 1990). Susie used a wheelchair at the table and a Tumbleform chair for Circle Time. She lay on the floor for Sensory Time.

The classroom had established activities and routines. There was a structure to the day for the class as a group and most activities included all the children. The exception was therapy because it was only required by some of the students. The day began with Circle Time done as a whole group, with the children organized in a semi circle on the floor, some in chairs, some in wheelchairs, and others in Tumbleform chairs. Ron sat on the teacher's lap during part of circle time. After the initial songs of circle time, the music therapist provided service twice per week, to the whole class. Circle Time was followed by the group moving to the table area in preparation for lunch. Circle Time was more than one hour long. Marty grouped children in various areas of the room, according to the relevant activity, but she delivered instruction through both group and individual instruction. No daily schedule or tangibles were used to facilitate transitions. Both participant children were tolerant of being moved from one activity to the next. Although Susie's routine was much the same as Ron's, she also experienced physical therapy with the teacher.

Marty was Ron's primary communication partner. Almost all of the communication with Ron was shared with the teacher. Marty reported that she was Ron's preferred person. Bea did interact during sensory time by using a massager with Ron.

Susie responded well to a variety of communication partners and her initiations didn't appear to be connected to seeking out a particular person. She exhibited alertness and listening behaviors regardless of who interacted with her. Although Bea was

reported to be Susie's preferred person, Carly was observed to share more interactions with Susie during the pre-observation period. Both Carly and Bea initiated three interactions with Susie. Of significance was the responsiveness exhibited by Carly who responded to nine of Susie's initiations.

Understanding Ron's form of communication, body language, was essential to recognizing his participation in the process of communication. Ron initiated communication only through body language during the pre-observation period. Marty and Ron sustained interaction at a body language level, particularly in the context of turn taking games involving hand play. Ron terminated interaction by putting his head down which the teacher interpreted as termination or the need for a brief break, in accordance with the length of the pause. Ron returned to the interaction without prompts when he was interested.

Susie initiated communication using vocalization, body language and on occasion, verbalization ("ma for caretaker). Her most common vocalization was "Ahh" for the purpose of calling for attention. The teacher and others were able to sustain interaction with her using any combination of these forms. Susie terminated interactions by looking away dramatically and maintaining that posture or by looking downward. These messages were understood by the staff.

Pre-Observation: Site #2:

Pre-observation script data will be presented within the structure of the Four aspects of Communication: Form, unction, Content, and Context. The following tables depict Karen's and Calvin's expressive forms when communicating together.

Table #9: Karen's Expressive Forms with Calvin

Pre-In-service Observation		
Verbal (spoken)	25	
Total messages		25

Table #10: Calvin's Expressive Forms with Karen

Pre-In-service Observation			
Body Language	5		
Body Language/Vocalization		1	
Vocalization		3	
Verbalization		7	
Total messages			16

Form. Karen shared six interactions with Calvin during the pre-observation period. She initiated four of them, although two of these were actually questions to the group, to which Calvin responded. A peer initiated one interaction with Calvin and the teacher joined in. Another involved Calvin calling for attention and the teacher's response. All of Karen's expressions were in the verbal, spoken form only. Karen expressed a total of 25 messages to Calvin, all in the verbal form. Calvin, by contrast, used body language, vocalization, and verbalization when interacting with Karen, in the pre-in-service observation period. In addition to the one initiation with the teacher, Calvin initiated sixteen interactions with his paraprofessional of nine years, Joan. The paraprofessional communicated using verbalization, coactive sign, and coactive body language in her interactions with him. Calvin was observed to shake his head no, but didn't nod his head yes. He sometimes imitated the number of syllables in vocalizations. Verbalizations were approximations, being recognizable to few. Exceptions were his clear verbalizations of the messages, "yeah," and "okay." It did appear that some of his vocalizations were used for specific functions and may have been content specific. For example, it was observed that he consistently used the vocalization, "Ahh" to call for attention.

Function. The following tables display the functions of communication expressed by Karen and Calvin in the pre-in-service observation period. Again, only those functions expressed at a frequency of four times and above are included in the tables. Others are discussed in the narrative.

Table #11: Karen's Functions with Calvin

Pre-In-service Observation	
Questions	7

Table #12: Calvin's Functions with Karen

Pre-In-service Observation	
Answer	9
Answering through Physical Action	4

Karen communicated twenty-five messages with questions being the most frequent function. Karen asked seven questions, but also asked another five questions that were combined with other functions. For example, one message was a combination of:

Directive/informing/question. Two questions were for the purpose of providing a choice. Calvin communicated primarily for the function of answering Karen's questions through vocalization or by complying through physical action. Calvin used twenty-four different functions or combinations of functions when communicating to all of his communication partners, during the pre-in-service observation session. He sent fourteen protest messages to various partners. Twenty-one of his messages were unintelligible verbalization attempts (vocalizations). These vague approximations of verbalizations were not interpretable to most communication partners, resulting in Calvin's need to repeat himself or to try to get his point across in another form of communication. It is interesting to note that Calvin sent sixteen calls for attention to his paraprofessional. He also requested objects, accepted objects, showed objects, and commented on the actions of others when interacting with his paraprofessional.

Content. The following conversational sequence is presented to demonstrate the content and level of interpretation provided by the teacher who created an opportunity for communication by offering a choice through the use of one and two syllable words. After asking a question, she would offer a choice between two options, one option would be a

one-syllable word and the other would be a two-syllable word. Calvin was then expected to express a vocalization in either a one or two syllable utterance. Whichever he performed, a one or two syllable vocalization, the teacher interpreted that vocalization to be a choice for the option that had the corresponding number of syllables. Verifying questions were posed to insure understanding. The following conversation was typical of adult interaction with Calvin. This passage also documents several student messages across three forms of communication: verbalization, vocalization, gesture (head shaking).

Karen:	Calvin? Calvin? Can you hear me?
Calvin:	Yeah.
Karen:	Do you want to go outside?
Calvin:	Uh-uh
Joan:	I don't know what that was.
Calvin:	Yeah.
Joan:	You went outside and you didn't like it.
Karen:	Do you want to walk or go outside? (offering a one and two syllable choice)
Calvin:	Ah Ah
	(Karen and Joan interpret this as the choice for outside because he vocalized two syllables.)
Karen:	You gonna put your coat on? Okay. You have to take it off when you come back in.
Calvin:	Shakes head no.
Karen:	Yes, you have to take it back off when you come inside.
Calvin:	Okay.
Joan:	Okay, you'll need a coat. I'll go get yours.
Calvin:	Ahh! and searching with hands (looking for Joan)

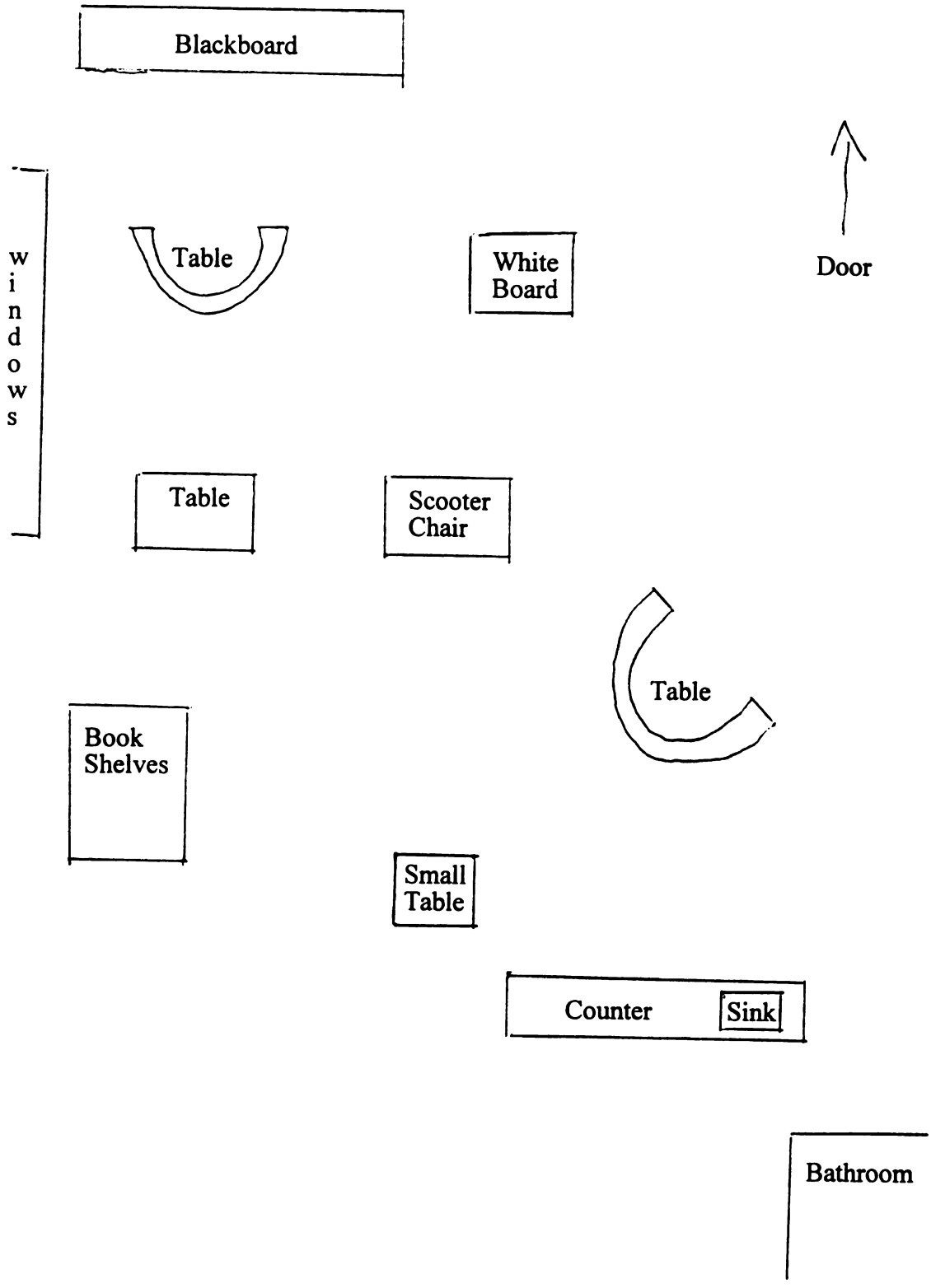
Context. The physical environment established areas within the room in which Calvin participated with the larger class and other areas in the middle and back of the room where he ate lunch and performed activities that didn't match up with the curriculum or activities of the other students. The physical classroom is depicted in Figure #3. Most group instruction occurred at the horseshoe shaped table nearest the blackboard. Calvin joined the group daily for instruction. Much of Calvin's individual instruction was delivered when he was situated at either the rectangular table or the small table.

The school was poorly lit, but this had no effect on him because he no longer had light perception. The noise level may have affected Calvin's hearing but he was appropriately augmented with an FM system which was adjusted to "take in" background sound or to only take in what the teacher or paraprofessional was saying during 1:1 interaction or instruction.

Among the important individual characteristics observed were Calvin's definite preferences, such as drinking his milk over eating anything at lunch. His preferences were well known to the paraprofessional who performed the role of informing others who were less knowledgeable about Calvin. He was quite prompt dependent and even when staff created long periods of time to "wait him out" he persisted in vocalizations to call their attention. He wanted constant, sustained interaction and was not observed to do any activity by himself. This was not an indication of ability, but the result of his interest in constant interaction within the school environment.

Calvin's routines and activities were influenced by the events of the day and weren't always consistent. Although there were established activities, the sequence of when they were offered to Calvin varied. Some of the variation could be accounted for by various support services that were provided and altered the schedule (Orientation and Mobility, Visually Impaired Consultation, and Occupational Therapy). However, it was

Figure #3: Site Two Classroom Diagram



also observed that the paraprofessional chose to do individualized lessons whenever group instruction didn't seem appropriate. Calvin's day was spent in one activity after another with Joan, the paraprofessional. He joined the larger group activities of the deaf education classroom when Joan was on break or at lunch or when there was a lesson that a staff member had developed to be accessible to Calvin. For example, in the pre-in-service observation, Shirley, the Speech and Language teacher brought in samples of ballet shoes and a nutcracker as tangibles for the children during a discussion of the Nutcracker. In addition, she actively involved him in operating the tape player. This made the whole group lesson accessible for Calvin and he was included. After the Speech and Language lesson, he went outside for recess, shared a tactile book with Joan (a referent book of a community-based experience), had lunch and rejoined the large group as Joan left for lunch. In addition, Calvin participated in general education for special events, though this was not observed.

Joan was Calvin's primary communication partner at school and she had been for nine years. Shirley, the speech and language consultant had also known Calvin for nine years and served as a case manager for him. She was equally able to interact with Calvin, but had fewer opportunities. He also shared communication with Karen, the classroom teacher and a peer during this session.

Calvin's skills within the component of the process of communication were most clearly demonstrated within his interactions with Joan. Calvin initiated conversations but usually did so with his paraprofessional, Joan. He experienced long sequences of sustained conversation and interaction over a particular activity with Joan on a daily basis and with Shirley, during individualized language lessons. Calvin terminated conversations by acting as though he was bored, pushing tasks away and by expressing annoyance vocally. Joan was able to interpret his meanings with ease.

Summary of Data Source Two: Pre-In-service Observation

The pre-in-service observation videos and transcripts revealed the interaction between form, function, content and context within each site. Site One teacher, Marty, initiated communication more often with Ron than Susie, however Susie had several ways of gaining adult attention whereas Ron didn't demonstrate this ability. Karen initiated few interactions with Calvin who shared almost his entire day with the paraprofessional. Although Marty used a variety of forms, she often neglected to combine verbal messages with another form that would make the communication accessible to Ron. Marty's communication was accessible to Susie because she had sufficient residual hearing. Karen used verbal communication only, which was accessible to Calvin, but was not his primary expressive form of communication. This study found, as did Stillman and Battle's (1981) study, that more than 50% of teacher communication with deafblind participant children was in the verbal form only and that teacher's use of forms was inconsistent.

Marty used a variety of functions, although she spent much of her interaction with both participant children in physical interaction. Much of Karen's communication was for the purpose of asking questions, which was also a primary function when interacting with other students in the class. Asking frequent questions was one of the principles of the program's approach. Through asking questions, program staff intended to stimulate the students to generate language.

Understanding the content expressed by the teacher was dependent on not only the child's conceptual knowledge, but on the teacher's form of communication being accessible to the child. Participant children in both sites often expressed themselves in forms that required the interpretation of adults. Adults sometimes needed to teach others how to use the child's forms. This role of staff was described by Mar and Sal (1995). Marty demonstrated a consistent ability to interpret the body language of participant

children. In Site Two, the paraprofessional held the same skills in interpreting both Calvin's body language and vocalizations.

The context set the stage within which communication occurred. In Site One, the noise level, classroom size and nature of the classroom population presented obstacles to both instruction and interaction. Since all nine children required tactile approaches, the teacher and staff were completely occupied, yet there was a significant amount of "down time" for each child. The teacher had established activities and routines and provided for both whole group activities and individual lessons. Whole group activities were presented by the teacher who attempted to involve each child. Activities occurred in the same sequence or schedule. Marty demonstrated a keen awareness of both participant children's individual characteristics and their effect on learning. She communicated with both children, but was Ron's preferred communication partner. Marty recognized that Ron was able to sustain and terminate conversation, but usually initiated only with objects. Susie was more able to initiate, sustain and terminate interactions through vocalization.

In Site Two, the components of context were different. The teacher, Karen, was primarily focused on group instruction. Most of the time, that instruction didn't include Calvin. The paraprofessional was responsible to decide when Calvin would be included in the group instruction and when to pull him aside for individual instruction. She was also responsible for deciding what to teach and when to teach it. Joan, the paraprofessional was Calvin's primary communication partner and she was adept at reading his body language and vocalizations. She served the vital role of explaining the meaning of Calvin's communication to others.

Data Source #3: Field Notes of Pre-Observation: Site #1

All the researcher field notes on the pre-in-service observation session could be categorized under the aspects of form or context. Field notes concerning form

concentrated on the need for appropriate forms of communication for participant children. There were also notations about the types of augmentative devices that were used with the children. A specific concern about the Whisper Wolf, an augmentative communication device, centered on the need to use consistent overlays that provided tactile input to the child. A support staff was using an overlay with a few of the same items as the classroom, but had organized the overlay in an entirely different order than the overlay used by the classroom teacher. This made it more difficult for Susie to use the feature of location to learn the messages.. The severity of Susie's vision loss created the need to use both location and tactile input to support her use of the AAC device.

Field notes about the component of physical environment, emphasized the hectic nature of the classroom, which was beyond the teacher's control. Although the environment provided a great deal of auditory input, it provided little in the way of opportunities to actively participate because participant children didn't have enough time with staff who were able to facilitate interaction. The teacher was using group instruction in an attempt to involve all the children, but opportunities for active participation were lacking due to the demanding nature of the classroom population. This was the result of grouping nine children who were blind, all with additional disabilities, in one classroom. Notes within the component of Activity and Routine included discussion of the use of the Little Room. The teacher incorporated the Little Room into her routine, at parents' request. She was well read on the philosophy of Lillie Nielson's work and shared this knowledge with the researcher. Marty saw the Little Room as a place where children could learn to initiate with objects and she viewed this ability as being related to later initiation with people.

A few notations about communication partners were included. It was noted that adults tended to move the children without cueing, although the teacher and Carly sometimes remembered to add verbalization after the interaction had been initiated. Marty was adept at interpreting body language and understood the communicative nature

of behavior. She was able to communicate using the child's preferred forms. These characteristics of her work are consistent with the positive roles of communication partners as cited by Goodall and Everson (1995); Siegel-Causey (1989); Stremel and Shutz (1995); and van Dijk (1986). The communication partner's role in understanding the child's individual characteristics was evident in the field notes. Although the researcher had originally viewed this category as being "individual needs and adaptations," Marty's rich knowledge of student characteristics and their impact on learning resulted in the researcher broadening the category, previously known as Individual Needs and Adaptations, to become, Individual Characteristics.

Data Source #3: Field Notes of Pre-Observation: Site #2

Again all the field notes on Site Two could be categorized within the aspects of form and context, with the addition of a notation about the importance of the team in Site Two. The most serious concern recorded was that the oral form of communication was not an appropriate choice as a primary expressive form for Calvin. While he loved to interact with others, his messages were not accessible to others because his speech was largely unintelligible, not only to the researcher but also to professionals and peers within the school.

The remainder of the field notes were within the aspect of context. Within the aspect of context, the component of activity and routine received attention in the field notes because both the teacher and paraprofessional reported that there were not enough lessons for Calvin. Both requested help with new lessons. There was also concern over the lack of a predictable routine. Calvin wasn't using a daily schedule, although he was reported to have used one the previous year, but inconsistently.

The component of communication partners, within the aspect of context, received the most attention by the researcher. Calvin's program was delivered by his paraprofessional. He sometimes joined the larger group, but it was Joan's responsibility

to provide the accommodations to make the lessons accessible. The teacher's focus was on the larger group of deaf children. She was not responsible to develop his lessons, although she did collaborate with both Joan and Shirley on his progress toward attaining goals and objectives. The teacher rarely interacted with the participant child. This was reported to be the pattern of the teacher of the previous year as well. Almost all of Calvin's interactions were with Joan, the paraprofessional. The extent of Joan's responsibilities was a concern. She was the instructional leader for the child, rather than the teacher. She was responsible to develop the lessons, figure out the strategies, teach others to interact with him, and to carry out day to day activities. She indicated that she felt burned out on the day of the pre-in-service interview with the teacher. A primary researcher concern was to get the teacher more actively involved with the participant child.

An additional theme, on the importance of the team support, emerged from the field notes on Site Two. This site had a strong educational team. Although team members held discrepant views of Calvin's abilities, they all shared an investment in him. They expressed an interest in working as a team, from the beginning of the study. This feature of team was already in place before the study began. The investment continued after it was decided that he would not be returning to the program the following fall. The team continued to be interested in improving their programming and shared an investment in providing Calvin with the supports for a smooth transition.

Pre-Observation Field Note Summary

Researcher field notes for the pre-observation session only addressed form and context for both sites. An additional theme of the importance of team support emerged in Site Two. The field notes reflected the strengths of each environment, but also the researcher's concerns for each site. All three children had important needs within the aspect of form. None of the children had an expressive form and access to an expressive

form(s) that served their needs. However, all three had adults who were able to interpret their current expressive communication. The classroom composition of Site One presented barriers to instruction. The teacher had little time to model and explain participant children's learning needs to other classroom staff because of the high demands of the classroom. While there was reason to be concerned about teacher and paraprofessional roles in Site Two, there was the benefit of a team approach.

Across Data Source Summary: Question #1: What are teachers' communication intervention models and practices for children who are congenitally deafblind?

Each of the methodologies employed revealed unique data in response to the first research question. The pre-in-service interview provided insight into the teacher's thinking about various aspects of communication and about their current intervention strategies. Both teachers employed what they already knew to provide communication supports for the study children. Teacher One, Marty, used her knowledge of augmentative communication devices as an initial place to start. Communication intervention for Marty was almost entirely focused on forms of communication, prior to the intervention. Teacher Two, Karen, used her knowledge of intervention with deaf children as a starting point. She attempted to "add" information on blindness to her previous knowledge base. She also displayed her knowledge of content and her understanding of the importance of instructional strategies. The teachers' dissatisfaction with their current practice and uncertainty about how to approach communication intervention for participant children was made apparent through the interview.

The pre-in-service observation was a source of detailed information about teacher and student communication. The pre-in-service observation session also revealed the interaction between each of the aspects of communication. For example, the student's use of particular forms to express specific functions or content was made obvious through observation. The pre-observation session provided the researcher with the opportunity to observe the interaction between student and teacher communication. One of the most

important findings was that both teachers used the verbal form alone for most of their expressive communication. While Marty's communication was for a wide range of functions, more than half of Karen's functions were questions or combinations of functions that included questions. Physical actions were a primary function for Marty, but Karen rarely interacted physically with Calvin. While Marty's messages were varied, most of Karen's messages were for the specific purpose of establishing an understanding of Calvin's communication. The classroom make-up of the two sites was very different, requiring different physical layouts. Student composition was different, making different demands on the two teachers. In Site One, Marty was Ron's primary communication partner because she viewed herself as his preferred person. Bea was cited as Susie's preferred person, although Carly shared more interaction with her. In Site Two, Joan, the paraprofessional was Calvin's primary communication partner. This was established practice, as was the expectation that Joan would provide a separate program for Calvin for much of the day.

Field notes displayed information that was shared "off camera" by the teacher. The field notes were also an indication of what the researcher considered to be the strengths and needs of each site.

Research Question #2: How will teacher's communication intervention models and practices change as a result of an in-service with follow-up coaching approach utilizing the Four Aspects of Communication model for communication intervention?

The post-in-service interview, follow-up observation sessions, stimulated recall sessions of the pre-in-service observation and follow-up observation sessions, written Action Plans and researcher field notes were all relevant data sources to research question two. In addition to providing evidence to the nature of both researcher and teacher thinking, the stimulated recall sessions provided a second source of evidence for teacher concerns and also provided the researcher with the opportunity to witness examples of a phenomena, named by the researcher, as "giving voice." Teachers participated in giving

voice when they verbally expressed the perceived body language messages of their students. The process of giving voice demonstrated to others their interpretation of the student's body language. Their unique understanding of the student's individual characteristics enabled them to create an understandable portrayal of the student's message that may have been inaccessible to someone who was unfamiliar with the child.

Post Interview: Site #1

When asked how she thought about communication intervention, Marty replied:

> I just started thinking about the environment. The environment in which the communication is going to occur. It's very important. Set-up. Availability. Equipment, having it, well accessible more. You can't be everywhere at once. Try to concentrate your communication when you're able to group properly. It helps. So the environment has to give way to that. I think about forms, mostly. What the child's trying to communicate, interpretation of their communication ....

Thus, Marty's interventions began with a focus on forms, the aspect that was most familiar to her. She became increasingly concerned about the physical environment. After viewing the first video, she determined that the physical arrangement of the room was contributing to the level of down time (non-instructional, unoccupied time) and she sought to reduce the time spent on transitions in an effort to increase instructional time. She connected what she saw on the video with the elements of the model that were able to support her in addressing her immediate concern. Teachers often make connections to the part of an innovation that most relates to their current concerns (Pugach and Johnson, 1995).

When asked why she started her interventions with forms, Mary replied:

> Basically, I think because of where the kids are and where I am in thinking about the kids. Form is the most important-what forms-maybe because it was the first time (first in-service). No, I guess because communication is so important to me and the ways that kids communicate, supporting their communication with whatever is necessary because without communication, you just have a bunch of kids in wheelchairs. It's true. I guess because I'm so into technology, form was a good place to start for me.

So, Marty started with what was most familiar to her.

Although Marty chose to begin her interventions with strategies associated with the aspect of form, she reported context to be the most important part of the model to her work with Ron and Susie. The following passage reflects Marty's recognition of the importance of context.

> The way I think of, it always starts with needs and adaptations. Because if you work through, you can step back into you know, I probably think about the child's needs in that form and then I try to build activities and routines around their needs and honestly, I have to say the last thing that comes to mind is the physical environment. Not that it should be the last. It should probably be ranked right up there, 1st, 2nd, or third, but sometimes you just can't change the physical environment, so it's not something that's at the forefront of my thinking.

Later in the interview, Marty reported that form was the easiest aspect to implement because it was most familiar to her and that function was the most difficult.

Marty made a shift from thinking only about forms, more specifically, augmentative communication devices to thinking more deeply about context. It was in this segment of the interview that the researcher realized Marty had created her own meaning for the component of Individual Characteristics, within the aspect of Context. She had interpreted individual characteristics to mean that the teacher must start with the individual child, moving into planning activities and routines appropriate to that child's needs. At first this seemed like a distortion of the meaning intended by the researcher, but resulted in the researcher reshaping the model to recognize individual characteristics as a broader concept, including instructional needs and individual idiosyncrasies that affect instruction. The phenomena, of teachers reshaping the model, is in keeping with Huberman's (1990) discussion of distortion of the model and Marzano, Pickering and Brandt's (1990) contention that individual teachers will change an innovation as the new knowledge becomes merged with their existing knowledge. It is also possible that Marty was delayed in her attempts to make a change in the physical environment of the classroom because in her previous school environment, she didn't have the option of changing the physical environment.

Post-Interview: Site #2

When asked how she thought about communication intervention, Karen replied:

> What comes into my mind? I guess what I'm thinking is, is for Calvin specific. Understanding his receptive communication and his expressive communication and basically prioritizing what his needs are for his experiences, his life....I don't think necessarily it will be a verbal expressive kind of communication. We've tried some tangible things and I guess the problem I have with the tangible systems is that they're not always with him. Well, I guess they could be. What I'm thinking is that the sign language would be most useful for him. If we can get him, if we find how many hand orientations he can make (she means shapes here) and he can put them on the different parts of his body and my thinking is that he'll always be more or less with people who are familiar with him...They'll be familiar communication partners with him and they can be taught his language compared to trying to teach Calvin what our language is.

When the researcher remarked that most of her interventions, based on the data from the Action Plans, were within the aspect of form, Karen responded:

> Well, I'm not sure it was. I think we were talking a lot about the content too. We made several lists, Shirley, Joan and I. What does he need to express? What does he need to receive? What is the most important? We did a lot of prioritizing. I think that's really where we started. And then the tapes got us really excited too, the Tangible Systems tape when we actually saw the case studies. And the sign, I don't think we even thought about that until the last couple of weeks. I think since Shirley and everybody's been doing the verbal forever, we really wanted to think about some alternatives. We've done that too (pointing to the aspect of function on the model diagram). We've prioritized it also. Oh, we went through your list of all the function things.

It was during this interview that Karen clarified that the faculty discussions she had referred to during the follow-up observations, were actually structured meetings with other school staff. They formally sat down and discussed the aspects of communication, as depicted in the model and Action Plan forms, and used that structure as a guide for instructional planning. Karen's ability to integrate the parts of the model seemed to be in contrast with the literature on the process of teacher change that emphasized that teacher's will take on one change at time and that change will be connected to an immediate need (Doyle & Ponder, 1977; Pugach & Johnson, 1995). One explanation for this finding could be the team approach and sense of community within the deaf education department. Karen, Shirley (the Teacher Consultant) and Joan were all comfortable with each other. Each was able to contribute to discussion and decision

making. Perhaps this sense of learning community contributed to Karen's ability to integrate the parts of the model into her thinking and planning. It is important to note that the Action Plans used in this study were structured around the entire model. Since the Action Plan structure supported team discussions, the actual written document affected Karen's ability to integrate elements of the innovation. The Action Plan mediated teacher learning.

When asked which parts of the model were most important to her work with Calvin, the teacher responded:

> Gosh, I think probably for Calvin, because he is so limited, probably not the function, as far ah ah, requesting action, requesting objects seems so far down the road. I think that form has been helpful and I think that the content has been helpful, just to think about those.

It is interesting to note that Karen cited Calvin's limitations as the reason to not address some of the functions he was already successfully expressing. Karen went on to explain that the contextual components were already in place before the study began. She also indicated that context was the easiest aspect for her to implement and that form was the most difficult.

Post Interview Summary

For both Marty and Karen, the aspect that was the most familiar and/or most established was the easiest to implement. Although Marty saw form as the first priority she made a shift during the study to looking at the importance of context. The videotapes were a strong impetus to her examination of the classroom environment. The videos provided both teachers with the opportunity to step back and observe their own teaching practices, cited by Joyce and Showers (1982) as being critical to teacher learning. The teachers' decision to start with what was most familiar is in keeping with the individualized nature of teacher implementation as discussed by Pugach and Johnson (1995). There is a connection between the individualized nature of teacher implementation and teacher's background knowledge.

Follow-Up Observation Sessions: Site #1

Three follow-up observation sessions, each two hours in length, were completed at each site. The sessions were videotaped and later transcribed in their entirety. The four aspects of communication were used to organize the discussion of observation data. The following tables depict the frequency of teacher's and student's use of expressive communication forms from the pre-in-service observation through final follow-up observation session. The pre-in-service obsevation data was previously discussed, but is presented here for data comparison purposes.

Table #13: Marty's Expressive Forms with Ron

Pre-In-service		
Body Language	22	
Body Language/Vocalization	1	
Body Language/Verbal	10	
Coactive Sign/Verbal	1	
Verbal (spoken)	25	
Total Messages		59
Follow-Up 1		
Body Language	3	
Body Language & Verbal	1	
Verbal	1	
Total Messages		5
Follow-Up 2		
Body Language	44	
Body Language & Verbal	6	
Object	5	
Verbal & Object	4	
Verbal	41	
Total Messages		100
Follow-Up 3		
No teacher data due to her absence.		

Table # 14: Ron's Expressive Forms with Marty

Pre-In-service		
Body Language	35	
Vocalization	2	
Total Messages		37

Follow-Up 1		
Body Language	7	
Total Messages		7
Follow-Up 2		
Body Language	72	
Vocalization	6	
Gesture	1	
Verbalization	1	
Total Messages		80
Follow-Up 3		
Teacher absent, no data on interaction with teacher		

The teacher initiated two interactions with Ron in the first follow-up session. Her interactions were reduced from the pre-in-service observation level because she spent much of the session caring for a sick child in the classroom. Marty sent five messages using the following forms: Body Language (3); Verbal (1) and Body Language with Verbal (1). While the teacher reported using total communication, it appeared that she actually used multiple forms but was likely to use them in isolation, rather than in combination. Ron initiated four interactions that were accessible to Marty, although it was not always clear who the intended partner was. Not all communication was directed at the teacher. Ron expressed himself through body language alone. Ron also initiated many times with objects in the context of the Little Room, though these were not coded as communicative attempts since another person was not present. This was the only setting in which he initiated frequently with objects.

The teacher initiated thirty-five interactions with Ron in follow-up session two. She sent one hundred messages using the following forms: Body Language (44); Verbal (41); Body Language and Verbal (6); Object (5); Verbal and Object (4). Ron initiated thirteen interactions, all of which were expressed when Marty was in his immediate vicinity; that is, the communication was directed toward her. He sent eighty messages, with seventy-two being expressed through body language alone. Ron was observed to use the form of gesture, specifically, a head shake for "no" twice, and six vocalizations.

The teacher and Ron sustained long interactions around a hand tapping on various surfaces during this session.

The teacher was absent for the third follow-up session so there were no initiations or interactions to record. Ron spent most of his time in interaction with Carly who engaged him in a lengthy of interaction of passing a ball back and forth. This interaction involved twelve cycles of turn taking. Carly made use of pause and Ron also brought her attention back to the task. The researcher also shared a lengthy interaction over lunch.

Marty's lowest level of interaction was evident in the first follow-up session, due to a sick child in the classroom. By the second follow-up session, she used tangible objects, but continued to struggle with combining forms of communication, throughout the study. Body language alone and verbalizations alone were Marty's most frequent forms of expressive communication. She was adept at receiving Ron's communication in any form. Body language was Ron's primary expressive and receptive communication form, with vocalization as a secondary expressive form.

Figures 15 and 16 display the expressive forms used by Marty and Susie across the observation sessions. Again, the pre-in-service observation is presented for comparison purposes. The teacher initiated two interactions with Susie in the first follow-up session. The teacher sent six messages to Susie with the following dispersion across forms: Body Language (1); Verbal (4); Verbal/Object (1). Susie was able to access the verbal messages since she had adequate hearing. This was the first session in which the teacher used the objects to communicate with Susie. Susie initiated seven interactions, that were all accessible to the teacher, but not necessarily directed by Susie to the teacher. Susie used body language alone for most of her expressions, but also used vocalization alone.

Figure #15: Marty's Expressive Forms with Susie

Pre-In-service		
Body Language	9	
Body Language/Verbal	4	
Coactive Sign	1	
Verbal (spoken)	9	
Total Messages		23
Follow-Up 1		
Body Language	1	
Verbal	4	
Verbal & Object	1	
Total Messages		6
Follow-Up 2		
Body Language	3	
Body Language/Verbal	1	
Verbal	13	
Total Messages		17
Follow-Up 3		
No teacher data-absent		

Figure #16: Susie's Expressive Forms with Marty

Pre-In-service Observation		
Body Language:	6	
Body Language/Vocalizations		3
Vocalization	16	
Verbal	1	
Total Messages		26
Follow-Up 1		
Body Language	8	
Vocalization	2	
Total Messages		10
Follow-Up 2		
Body Language	3	
Vocalization	14	
Verbalization/AAC	9	
Total Messages		26

The teacher initiated four interactions with Susie in the second follow-up session. The teacher sent seventeen messages to Susie in the following forms: Body Language (3); Verbal and Body Language (1); and Verbal (13). Susie initiated twenty interactions, that were accessible to the teacher, although not all were necessarily intended to attract

the teacher's attention. She sent messages in the following forms: vocalizations for the function of calling people into her space and verbalizations through use of the augmentative, alternative communication device (AAC). This was the first session in which Susie was observed to have access to an AAC device. The teacher had shared the Whisper Wolf and overlays with the researcher during the pre-in-service observation, but the device wasn't used during that period of observation. Although Susie had a Whisper Wolf, she also used a Big Mac which was a single message device. She used it repeatedly to ask, "Where's my lunch?" The context and repetition was appropriate because lunch was almost thirty minutes late.

The teacher introduced tangible symbols in follow-up session two, but hadn't yet made the transition to thinking about accessibility. She held up tactile display and said, What comes after music? We had circle this morning, then comes music, then what comes next? "Circle time, toothbrush, toilet roll (to cite the three tangibles)." She gestured toward the objects on the display, but provided only several children with the opportunity to touch the objects. Therefore, the object display was only accessible to those who had either sufficient vision or to those who were given the opportunity to explore the display tactually.

The teacher was absent for the last follow-up session. All of Susie's interactions during the observation period were with Carly. The focus of their interaction was around caretaking activities during this session.

The teacher's most common expressive form when interacting with Susie was verbalization. This was appropriate, although her communication would have been more accessible if Susie's hearing were appropriately augmented. The teacher was less apt to respond to Susie than Ron because she was not identified as Susie's preferred person. Susie's most frequently used expressive form was vocalization which she often used in an attempt to draw others into her physical space.

The researcher focused on several concerns about communication forms across the on site observations. She modeled the use of her watch as an object of reference. Objects of reference are concrete representations used to represent people in the child's environment (Van Dijk, 1986). The watch was unique as it had a raised dome that would be recognizable. She demonstrated the use of the object of reference in both entrance and exit greetings when interacting with participant children. In addition, she verbally informed both children as to her reasons for leaving an interaction, although these verbal messages were only accessible to Susie. This was an effort to model appropriate entrances and exits for staff. In addition, the researcher emphasized the use of combined expressive forms. The researcher raised questions about the accessibility of AAC devices, that were often placed away from the students.

Function

As indicated in Chapter Three, several new early functions emerged from analysis of the data. For example, it was important to distinguish between different forms of answering performed through the form of body language. Sometimes children answered an adult by performing a physical action, while at other times children answered adults by simply cooperating with the adult's physical manipulation. These are distinctly different ways of answering. Tables 17 and 18 display the expressive and receptive functions displayed across the observation periods. The pre-in-service observation data is included, although it was previously discussed. The teacher sent five messages to Ron in the first follow-up session, with no single function having a frequency of four or more. Her messages were for the following five purposes/functions: Informing (1); Comment on Action (1); Question (1); Physical Action (1) and Coactive Physical Action (1). Ron's most common functions were to perform a physical action (6) and to protest (5). Sometimes his functions were difficult to interpret.

Table #17: Marty's Functions with Ron

Pre-In-service Observation	
Physical Action	14
Comment on Action	13
Directives	4
Physical Affection	4
Follow-Up 1	
No functions with frequency of 4 or more	
Follow-Up 2	
Physical Action	19
Comment of Action	7
Directives	26
Answering	11
Question	6
Informing	6
Follow-Up 3	
Teacher absent	

Table #18: Ron's Functions with Marty

Pre-In-service Observation	
Physical Action	10
Answer through Physical Action	4
Physical Cooperation	7
Follow-Up 1	
Physical Action	5
Follow-Up 2	
Physical Action	9
Physical Cooperation	18
Protest	20
Calling	9
Answering	12
Follow-Up 3	
Teacher absent, no data of interaction with teacher	

When interacting with Ron, in Post Observation Session #2, the teacher communicated twenty-four different functions, or combinations of functions, with the following breakdown:: Directives (26); Physical Action (19); Answering (11); Comment on Action (7) Question (6); Informing (6). She also posed several rhetorical questions. Marty displayed sixteen additional functions at rate of one each. Ron's primary functions

were for the purpose of Protest (22); Physical cooperation when the teacher had physically acted upon him (18); Physical Actions (16); Answering (15); and Calling (9). The high level of protest messages was observed to be connected to the teacher's high incidence of directives.

The functions of greatest frequency for the teacher, across the sessions were physical actions and directives. Ron's most frequent functions of communication, across the sessions were physical actions, protest, and physical cooperation.

Although the teacher was not present for the final follow-up session, Ron's most frequent functions of communication with staff members were: Physical Actions, (17); Accepting Object (15); Giving Object (11); Physical Cooperation (12); Request for Action (8); Calling (3); Protest (3); Answering (7); and Unknown (15). Most of the unknowns were due to the difficulty in coding the meaning of his tapping behavior. Some of these could have been calls for attention, others were stimulation. The activity of turn taking with the ball elicited the high levels of accepting objects and giving objects. This example illustrates the relevance of activities to the creation of opportunities to practice specific communication skills. Ron's level of protest dropped for this session, probably due to the teacher's absence as she made the most demands on this student.

Table # 19: Marty's Functions with Susie

Pre-In-service
Physical Action 8

Follow-Up 1
No functions at frequency of 4 or more

Follow-Up 2
No functions at frequency of 4 or more

Follow-Up 3
Teacher absent

Table #20: Susie's Functions with Marty

Pre-In-service	
Physical Cooperation	5
Comment on Action	6
Calling	9
Follow-Up 1	
No functions at frequency of 4 or more	
Follow-Up 2	
Calling	10
Answering	6
Follow-Up 3	
Teacher absent	

The teacher's purposes for communicating with Susie in follow-up session were: Inform/Directive (1); Comment on Action (2); Directive (1); Physical Action (1). Susie's primary purposes of communication were to call attention to herself through body language or vocalization and to answer others. For example, she would sit erect, moving her head in one direction then another when seeking interaction (calling in body language). She also immediately turned in the direction of the speaker if interested in interaction.

In follow-up session two, Marty expressed seventeen messages for eleven different functions or combinations of functions. No function was expressed more than twice. Those used twice included: Answering/Affection; Directives; Answering; Informing; and Rhetorical Questions. Again Susie's primary functions were Calling (10) and Answering (6). A new function, question, was observed during the session because Susie had access to a Big Mac augmentative communication device. She used it to ask, "Where's my lunch?" This resulted in questions being asked in the verbal form. She was also observed to stick her finger down her throat for the function of calling when vocalization and body language didn't bring attention.

No data on teacher and student interaction could be collected for the third follow-up session because the teacher was absent. Susie didn't have access to an AAC device,

although the researcher tried to locate it for her. None of the classroom staff knew where it was. Her most common functions for this session were answering, physical actions, calling, and request for actions.

Across the sessions, Marty's most commonly occurring function was physical action, although she communicated for many purposes at low frequency levels with Susie. Calling was clearly Susie's primary purpose or function of communication. She also exhibited high levels of answering when relating to the paraprofessionals and support staff. Answering didn't emerge as a high frequency function with the teacher because the teacher didn't interact often with Susie.

Content

Both Ron and Susie had distinct ways of communicating, "I'm finished," that were recognized by staff. Susie pushed tasks away and/or dropped them on the floor deliberately. Ron lowered his head and pushed away. Ron expressed anger when left without warning. In follow-up session two, Ron verbalized "mama" in the context of an extended tapping game with the teacher. He shared a lot of physical interaction with the teacher. He was functioning at a body language level and his teacher was also expressing in that form. This shared interaction, in Ron's preferred expressive form, was important to his motivation to interact. Stremel and Shutz (1995) cited the importance of teacher modeling in the child's preferred expressive communication form. Ron searched with his hands to locate someone who had left his area. He also shook his head to express "no." Susie nodded to express the message, "yes." In follow-up session two, Susie made use of the Big Mac to ask repeatedly, "Where's lunch?"

Context

A contextual feature to note for the first follow-up session was a sick child in the classroom. Much of the teacher's attention was directed to resolving the care of that child and it reduced the number of interactions with Ron.

The physical environment features were the same in the first and second follow-up sessions as in the pre-in-service observation sessions. However, later in the study, the staff changed the physical environment to allow for improved movement and interaction. This change following the teacher's review of the pre-observation video that heightened her concerns about the amount of down time and its relationship to grouping and transition practices. Figure #4 depicts the new physical arrangement. One important change was the addition of a wheelchair accessible table and removal of one that wasn't. The ball tent was placed in the corner. Equipment was moved out of the Circle Time area by the bulletin board and relocated along the windows. This was significant as it saved time previously invested in shifting equipment around for each whole group lesson. A horseshoe shaped table replaced the second rectangular table, resulting in staff being able to move about to work with several children more easily.

The first follow-up session revealed two of Ron's individual characteristics. Ron tantrumed if left alone, when he was not finished with the interaction. For example, this occurred when Carly left the area without warning. Ron also indicated a need for a pause in his work cycle by putting his head down. The teacher's recognition of this characteristic became clear in one of the Stimulated Recall sessions. This action of Ron's did not necessarily mean that he was finished with the activity. It sometimes represented the need for a brief break, a pause.

There was also staff confusion about Ron's hearing as evidenced by the following sequence:

Researcher: He used that rattle with the yellow handle and he's used that really soft piece (reporting to the teacher her observations about Ron while he was in the Little Room)

Marty: Must like the sound.

Susie demonstrated functional use of hearing as staff could yell across the room and she demonstrated not only her hearing, but also understanding of their messages in concrete ways, as demonstrated in the following interaction.

Carly: Play it again Susie" (in reference to keyboard)

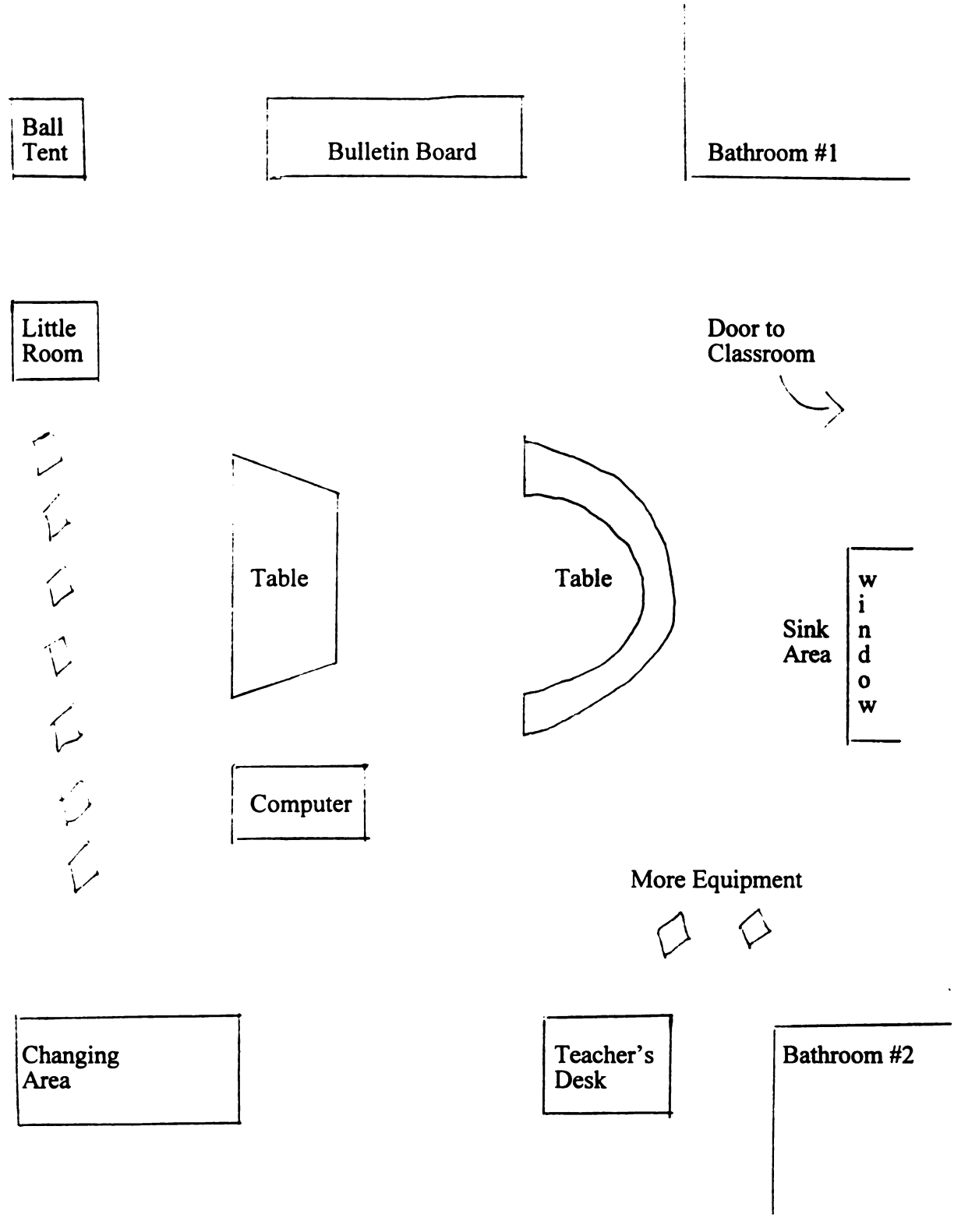
Susie immediately resumed playing the piano.

Some changes in activity and routine occurred across the sessions. Daily living skills were initiated in this session per administrator directive. The teacher was directed to do Daily Living Skills after her opening Circle Time. This routine occurred before lunch and involved toothbrushing, face and hand washing. This new addition created an additional "down time" problem from the pre-in-service observation session. The children experienced dead time between the transition from Circle to the Daily Living Skills table area and again between Daily living Skills and lunch arrival.

The teacher was absent for the third follow-up session. A new lunch routine was established for Ron at the parents' request. Staff were asked to not create a struggle out of lunch in the attempt to demand more independent behavior. The researcher supported his eating and communication that day by employing some of Ron's preferred hand games. The researcher established an opportunity for Carly to engage in a turn taking activity that incorporating balls.

Although the teacher was Ron's most frequent communication partner, he shared interaction with the other staff as well. Ron shared interaction with Susie on several occasions across the follow-up sessions. However, most of Ron's initiations were with objects, rather than with people, particularly in the context of the activity of the Little Room. Carly played an important role as a communication partner with Susie, since the teacher was more likely to interact with Ron. The teacher was skilled at reading body language. For example in follow-up Session One from the observation transcript, Ron's

Figure #4: Site One Revised Classroom Diagram



head was down and he was tapping and occasionally reaching backward for suspended objects. He had scooted near the opening of the Little Room. Marty remarked, "Are you getting bored in there yet, buddy?"

Staff were able to recognize Susie's ways of calling attention, and if they were in the physical vicinity, they responded to her vocalizations. It was interesting that although staff recognized that Susie had a consistent vocalization for calling attention, Ron's vocalizations weren't interpreted in the same way. He did not appear to have a consistent vocalization for any particular purpose. When Susie's repeated attempts to draw attention through vocalization went unrecognized, she reverted to gagging herself which was immediately interpreted as a call for attention. This provided additional motivation for staff to respond promptly.

Turn taking games, performed at a body language level, were recognized as important to communication development. The researcher supported staff to connect this to the process of communication involving initiation, sustaining, and terminating behaviors. Turn taking was a stable feature of music therapy, and often in Circle Time. For example, in follow up session two, they played Hot Potato and a rendition of the same game using a balloon. Classroom staff physically supported student participation.

Table # 21: Karen's Expressive Forms with Calvin

Preobservation:		
Verbal	25	
Follow-Up 1:		
Body Language	2	
Coactive Body Language	3	
Verbal	26	
Verbal/Body Language	1	
Total Messages		32
Follow-Up 2		
Teacher unavailable, no interaction		
Follow-Up 3		
Body Language	1	
Verbal	45	
Total Messages		46

Table #22: Calvin's Expressive Forms with Karen

Pre-In-service		
Body Language	5	
Body Language/Vocalization	1	
Vocalization	3	
Verbalization	7	
Total messages		16
Follow-Up 1		
Body Language	13	
Vocalization	8	
Verbal	9	
Total Messages		30
Follow-Up 2		
Teacher unavailable		
Follow-Up 3		
Body Language	15	
Vocalization	4	
Gesture	3	
Verbalization	16	
Total Messages		38

Karen initiated three interactions with Calvin in the first follow-up session. He initiated two with her. Most of Karen's communications (26 of 32 messages) were sent in the verbal alone form. She also sent two messages through body language, three through coactive body language and one in the verbal/body language combination. This was actually an example of Tadoma. In contrast, Calvin expressed in the following forms: Body Language (13); Vocalization (8); Verbal (9). The first follow-up included a sustained conversation between the teacher and Calvin.

There were no interactions with the teacher in the second follow-up session. Karen was out of the room doing assessment for upcoming I.E.P. meetings. Communication partners included Joan, researcher and peers.

In follow-up session three, the teacher initiated five interactions with Calvin and he initiated one with her. The teacher expressed forty-six messages, forty-five in verbal only form and one in body language. Calvin expressed thirty-eight messages, with

sixteen messages in verbal form, four in vocalization, three in greeting (head shakes) and fifteen in body language.

Across the session, the researcher encouraged staff to identify a more appropriate primary expressive form for Calvin. Staff were encouraged to use Tadoma when speech was encouraged. They were also encouraged to use sign, tangibles, and textures. The researcher developed a protocol to support staff consideration of forms. The protocol was intended to maintain and support Calvin's current verbalization, but to extend his expressive communication to include additional forms. Decisions about expressive forms were particularly difficult due to the progressive nature of Calvin's disabilities.

Function

Table # 23: Karen's Functions with Calvin

Pre-In-service	
Questions	7
Follow-Up 1	
Physical Actions	5
Questions	7
Directives	4
Follow-Up 2	
Teacher Unavailable	
Follow-Up 3	
Questions	10
Comment on Action	8
Informing	8
Directives	9

Table #24: Calvin's Functions with Karen

Pre-In-service	
Answering	9
Answering through Physical Action	4

Follow-Up 1	
Physical Actions	5
Answering thorugh Physical Action	6
Answering	10
Comment on Object	4
Follow-Up 2	
Teacher Unavailable	
Follow-Up 3	
Physical Action	8
Answer through Physical Action	5
Answer	18
Unknown	5

In the first follow-up session, the teacher communicated primarily for the function of asking questions with seven occurrences. Twelve of her individual messages were for a combination of functions. She also included questions with other functions for four additional questions. In addition, she also expressed four directives, with an additional three directives combined with other functions. She also performed five physical actions that elicited a communicative response from Calvin. His primary function was answering, with ten examples. He also answered through physical actions for an additional six occasions. This session raised the concern that the teacher's level of questions, combined with the frequency of directives, could actually create passivity in the learner. Rowland and Schweigert (1993) found that reducing the number of directives resulted in increased number of communication opportunities. Other communication partners included Joan, Shirley and the researcher. There were no interactions with the teacher in the second follow up session.

The teacher expressed forty-six messages to Calvin in the third follow-up session for eleven different functions or combinations of functions with these being in frequency higher than 1: Comment on Action (9); Question (10); Directive (9); Inform (8). Examples of greeting and informing were noted. Calvin's primary functions were Answering (18) Answering/Physical Action (5) and Physical Actions (7). The high level

of directives was due to a specific activity where Calvin was on his scooter chair and the teacher was directing him in physical space. Calvin answered in the verbal form.

Karen's primary function of communication, when interacting with Calvin, was to pose questions. Calvin's primary function of communication was answering through verbalization or through physical action. This is sensible given that questions evoke an answering response.

The researcher focus on function was to support Karen to critically examine the practice of questioning. It was noted that staff often asked questions, didn't like the response and then repeated the question until the desired response was received. The researcher sought to encourage staff to feel comfortable with making statements to express various functions. The researcher also emphasized that questions should only be asked when the response was to be respected. Such behaviors were modeled throughout the study.

Content. Calvin frequently verbalized "okay" and "yeah." He responded to implied directives. For example, when a tape player was placed in front on him during the pre-in-service observation session, and Shirley said, "Calvin, here's the tape player," he immediately located it and began interaction. Calvin shook his head to express "no," but used verbalization to express "yeah." He had distinct vocalizations. For example, "Ahh" was the vocalization for the function of calling. He communicated when he was done by shaking his head "no" or by pushing the task away. It was observed in the pre-in-service observation session that the teacher sometimes communicated many messages with little or no pause. For example:

> Open your book. Open your book, Calvin. Open it. Calvin, I'm going to put your book in your square. Can you open it? (Teacher placed book in the tactile square that's attached to the group table) There you go. Don't push it. Open it. Pick it up. Pick it up, Calvin. Pick it up. Open (physically prompting him to). Calvin, can you find the bus? Those are wheels. They are round. Calvin, can you find that bus? You need to look. (Calvin is feeling the bus.) That's the bus, Calvin. It has round wheels.

Later in the same session she communicated:

> Calvin, feel your book. Feel your book. There are leaves in your book. They are leaves from the woods. Can you feel the leaves?

Calvin tapped on table for attention and for self-stimulation when bored.

In the first follow-up observation session, the teacher insisted on clear verbalization for a greeting and Calvin verbalized "hi" instead of his usual "yeah." This clear verbalization for "hi" was observed only one other time, in the context of returning a greeting to general education peers. The teacher used Tadoma for the first time to support Calvin in saying her name. Calvin exhibited a second meaningful vocalization. He vocalized "mmm" only when eating a preferred food, specifically a cracker or milk. The teacher made extensive use of questions, which she also did with the other children in the classroom. An example follows:

> Karen: You found it Calvin. It's a cracker. Do you want to eat it?
>
> Calvin eats it and says, "mmm"
>
> Karen: You like it?
>
> Calvin: Mmmm
>
> Karen: There's some more. Want to find it?
>
> She helps him locate button
>
> Karen: It's open again. What's in there?
>
> He reaches in and locates another cracker.
>
> Karen: Did you find a cracker?
>
> Calvin finds another one and puts in mouth.

Joan, the paraprofessional, also used questions to clarify or verify understanding. She was also adept at using this method of language support as depicted in the following script:

> Joan: Do you want to stand up without your shoes on?
>
> Calvin: Yeah.

Joan: How does that feel? You don't have your braces on or anything.

Calvin: Yeah.

Joan: You're doing such a great job.

Calvin: Yeah.

Joan: Good to strengthen them. Want to do it again?

Calvin shakes head no.

Joan: Don't want to do it?

Calvin shakes head no.

Joan: Okay, I did ask, didn't I?

It was suggested that questions only be asked when it was possible to honor his answer.

Both Karen and Joan used questions to offer choices, to establish sequence, and to verify meaning. Two examples of the use of questions to verify meaning, follow:

Example 1:

Joan: You're not going to move are you? Gonna stay?

Calvin: Yeah.

Joan: You're gonna stay there?

Calvin: Yeah.

Example 2:

Karen: You want to get up?

Calvin shakes head no

Karen: Do you want to sit?

Calvin shakes head no.

Karen: Do you want to sit?

Calvin: Yeah.

Joan also used questions to establish understanding of sequence and routine. For example, in the context of assisting Calvin in putting on his socks, shoes and braces, Joan asked the following questions: "Are we all done? Where does that go? Want to put it

on? What's next?" Joan also used questions to establish an understanding of sequence during the following Orientation and Mobility route in asking the following questions: "What room is this? Remember what comes next?"

Joan also communicated many messages for the purpose of commenting on objects in follow-up session two. Examples included, "This one's soft. That one's spongy. This one is kind of crinkly."

The importance of choice making is well-documented (Brown & Lehr, 1993; Downing & Siegel-Causey, 1988; Stremel & Shutz, 1995). Joan sought to increase Calvin's sense of control by offering choices, although she was occasionally observed to challenge Calvin to rethink a choice. One of the interventions focused on only providing choices when the response would be honored.

In the third follow-up session, the researcher became more aware of Calvin's receptive language abilities. When asked by Joan "Where's your other one?" (in reference to the other brake on his wheelchair), Calvin clearly turned and gestured to indicate location. This was another example of Calvin's ability to draw an inference. It was in this session that the context of activity and its role in setting the stage for the kinds of functions of communication to be expressed became clear. For example, in the context of Calvin locating others, the teacher communicated many directives. Although professionals often identify a high levels of directives as being poor practice, in this case, it was sensible practice in the context of the particular activity. The child was engaged in exploration on a scooter chair and the teacher was directing him to various locations within the classroom. A sample from that sequence follows:

Karen: Now come forward.

Calvin follows direction.

Karen: There you go. Reach out for me. There I am. Over here.

He takes her hand and puts on his head. (request for action)

Karen: You want me to pat your head?

Calvin: Yeah.

The above sequence demonstrates the importance of activity to the creation of opportunities to express particular functions and content.

Context. The physical environment provided Calvin with the opportunity to be physically included in large group activities, but also provided him with several individual learning areas within the same classroom. While the school lighting varied, Calvin no longer exhibited light perception. Calvin's individual characteristics were well known by the paraprofessional, but the teacher became more knowledgeable across the follow-up sessions. His hearing was properly augmented.

Calvin participated in many activities, both large group and individual lessons. In the pre-observation session, he participated with the support of the Speech and Language teacher in a literacy lesson on the Nutcracker. This was the only large group lesson in which tangibles were observed to be used. Calvin joined whole class lessons after lunch when Joan left for her lunch. The teacher included him by communicating to him verbally.

Calvin cooperated during a lesson using a monthly calendar with tactile numbers, though he did not have the tactile discrimination skills or number concepts to make the lesson meaningful. This was understood by the paraprofessional who questioned the worthiness of this activity. She also demonstrated his use of what the researcher named, a "Who Board." It included tangible representations for each of the staff and was used to review who would be working with Calvin on a given day. It was not used on a daily basis and the teacher indicated that no one took the time to match symbols with him at the time of their interaction. Calvin was observed to actively participate in performing the sequence of putting on his socks, shoes and brace, as well as to actively participate in his bathrooming routine. He shared an interaction with a peer who brought some flowers in

from the playground. The Occupational Therapist shared a book with him and began the lunch routine. Lunch began anywhere from 11:40 to 12:20 which may have been too great of a variation for Calvin. It was apparent that staff had not coordinated the use of Calvin's "Talk Box" (AAC device). This was demonstrated when the paraprofessional returned from lunch and provided feedback to the Occupational Therapist about why she preferred not to use the Talk Box at lunch.

Calvin shared no interaction with the teacher in the second follow up session because she was doing assessments. His activities included an Orientation and Mobility lesson in which he demonstrated consistent, active participation. He also shared a tactile book with Joan. The researcher supported this interaction by grabbing tangible objects to correspond with concepts presented in the book. For example, when they reached the page about keys, the researcher took out her keys for Calvin to explore. Calvin also explored the hallway with the paraprofessional in this session, which included a brief interaction with general education peers.

The researcher requested that several activities be repeated for the third follow-up observation session. She brought in tangibles to correspond with each of the pages in the book that was shared during the previous session. This was to model the importance of concrete experience to literacy lessons. The researcher also focused on demonstrating how to embed instruction on concepts within various lessons. For example, the book included a page about socks. The lesson was paused and socks of various textures and sizes were explored. Calvin was observed to enjoy a conversation game with Joan, in which he initiated Tadoma and requested that she imitate his vocalizations. Auditory input was clearly an enjoyable experience for Calvin, as well as a form through which he accessed information. Joan shared several conversation boxes centered on various topics during this session.

Joan played an important role as Calvin's primary communication partner. She often interpreted Calvin's vocalizations or body language for others. The following

passage demonstrates a long sequence in which Joan struggled to establish understanding of Calvin's intention.

> Joan: Yes. That's a brace. Hand me the other brace.
>
> He does.
>
> Joan: Good boy. That's good. Do you know where your brace is?
>
> Calvin: Hey
>
> Joan: Where is it? There's the shoe, your little brace and the big brace.
>
> He reaches, takes her hand and pulls it toward himself. (Possibly communicating, "You do it." Joan rolls her eyes.)
>
> Researcher: That's what I was wondering too, if he just wants you to take care of this
>
> (She often does). It's hard.
>
> Joan : It is.
>
> Calvin leans in for her to rub his head
>
> Joan rubs his head
>
> Researcher: That's so reinforcing.
>
> Joan: Now will you get the brace?
>
> He hands her the little one.
>
> Joan: No, it's not this one.
>
> Calvin takes the little one and puts it inside shoe on table while Joan's head is turned to attend to another student.
>
> Researcher: Look! He's put the little brace into the shoe.
>
> You've put the brace in the shoe, Calvin.
>
> Para goes on to finish the dressing sequence.

Calvin demonstrated his understanding of the sequence by putting the small brace inside the shoe, but he was unwilling to participate on this particular day. Therefore, what appeared to be an inability to participate, was actually a polite avoidance of task. Finally, he clearly demonstrated his understanding of the task and took Joan's hand and placed it

on his shoe. This was a definite request to do it for him. Again, Joan's familiarity with Calvin supported her ability to interpret his body language messages. This ability to interpret meaning expressed in various forms, is an essential part of the role of an effective communication partner (Goodall & Everson, 1995; Siegel-Causey, 1989; van Dijk, 1986).

Follow-Up Observation Summary

Both teachers expressed many messages in the verbal form alone. Marty also used other forms, but not always what was accessible to the students. While Calvin was able to hear Karen's communication, verbalization wasn't effective as a primary expressive communication form for him. This created the need for communication partners to develop skills using additional forms so that they could provide modeling in the use of new forms. While Marty used a variety of forms, she seldom greeted or labeled. Karen's expressions were usually questions, in keeping with the approach she used with the other children. Children in both sites were observed to use AAC devices, but these devices weren't consistently available to the children. Susie and Calvin used specific forms for specific functions and to express specific content. Marty made significant changes in the physical environment during the course of the study, to enhance student participation. These changes were directly connected to her viewing of the observation videotapes, as indicated in the Stimulated Recall sessions. The physical environment was supportive to learning in Site Two, so no changes were made. While Susie demonstrated functional hearing, she wasn't properly augmented. Marty (Teacher, Site One) and Joan (Paraprofessional, Site Two), the professionals most familiar with participant students, were aware of how individual learner characteristics affected participation. While activities and routines were stable in Site One, the level of active participation was low. Students seldom had more than one opportunity to provide feedback to the teacher within a particular whole group lesson. The activities and routine

within Site Two varied, providing Calvin with a schedule that was not completely predictable. Activity decisions were made by the paraprofessional initially, but the teacher grew consistently in her involvement in the choice of lessons and also demonstrated a higher level of participation with Calvin during follow up sessions one and three.

All three participant children had the benefit of at least two communication partners who were able to interpret their communication. Ron and Calvin participated in many sustained interactions with staff, although Ron's turn taking was at a body language level and Calvin's was in vocalization and verbalization. Susie, however, rarely had the opportunity to have more than one or two turns with any communication partner. Staff came in and out of her space to answer her calls for attention, but never shared sustained interaction with her. The exception was the additional staff who came in for lunch and supported Susie's eating skills.

Most of Ron's initiations were with objects, but he sustained conversation at a body language level. He also terminated conversation effectively. Susie initiated conversation through vocalization and body language, but was rarely given the opportunity to sustain interaction. It is possible that her individual characteristics may explain this phenomena. Perhaps staff was more familiar with sustaining conversation at a physical level than through vocalization. The adults generally terminated interaction with Susie. Calvin initiated, sustained and terminated conversation through body language, vocalization, and occasionally through verbalization. Toward the end of the study school staff agreed to teach Calvin a few signs. Within two weeks of the completion of the study, he gained several signs, which he used to initiate requests.

Data Source #2: Stimulated Recall Sessions: Site #1

Four stimulated recall sessions focused on the pre-in-service observation videotape and the three follow up tapes. Stimulated recall session conversations were

audiotaped and later transcribed. Each transcript conversation was categorized according to the four aspects of communication. The following figure displays the frequency of researcher initiated (R) and teacher initiated (T) conversations about each aspect across the four sessions. The aspect of context is displayed to show the frequency of researcher initiated and teacher initiated conversations within each component of the aspect of context. In addition, teacher concerns, shared during the stimulated recall sessions, are discussed. The Stimulated Recall Sessions are presented in Table #25.

Table #25: Site One Stimulated Recall Conversations

		S#1	S#2	S#3	S#4	
Form	R	4	1	5	1	R = 11
	T	6	2	0	3	T = 11
Function	R	6	5	2	0	R = 13
	T	4	0	0	1	T = 5
Content	R	6	3	3	0	R = 12
	T	1	5	3	1	T = 9
Context	R	10	20	26	13	R = 69
	T	12	13	16	1	T = 42

Components of Context

		S#1	S#2	S#3	S#4	
Phys. Env.	R	0	2	5	2	R = 9
	T	1	1	1	0	T = 3
Indiv. Char.	R	7	5	11	4	R = 27
	T	6	3	2	0	T = 11
Act. & R.	R	2	10	8	5	R = 25
	T	2	8	8	1	T = 19
Comm. Pars.	R	1	3	2	2	R = 8
	T	2	1	1	0	T = 4
Process	R	0	0	0	0	R = 0
	T	1	0	4	0	T = 5

Qualitative discussion: Session 1. The researcher initiated twenty-six conversations with the following breakdown by aspect of communication: form (4), function (6), content (6), and context (10). Seven of the ten researcher initiated context conversations were regarding the component of individual characteristics with no discussion about physical environment or the process of communication. The teacher, Karen, initiated twenty-three conversations, with the following breakdown by aspect: form (6), function (4), content (1), and context (12). The high frequency of both researcher and teacher initiated conversations about individual characteristics occurred as the researcher came to know the children with the teacher's support. The researcher was also focused on supporting the teacher to recognize the amount of down time in the classroom.

Marty mentioned several concerns about implementation of the model, during the first Stimulated Recall session. She was concerned about the difficulty of accessing equipment at school, and the lack of money and people to help in her classroom. Marty expressed her concern over staff distribution of time and attention within the classroom in the following passage.

> I feel more like I end up leaving them by themselves to deal with emergencies or to deal with behaviors. You know, the kids that don't move or don't communicate a lot, they're the ones that get left.

Marty's recognition of this practice confirms Rowland's (1989) finding that children who initiated less received less cues to communicate.

The teacher used Simulated Recall Session One as a time to share many of the individual characteristics and idiosyncrasies of the participant children. It was this discussion, coupled with the video of the first observation, that caused the researcher to begin to rethink the category of Individual needs and adaptations and rename it to simply include characteristics. Marty was aware of how individual characteristics affected learning. For example she noted how Susie's hair often interfered with learning or how

particular students preferred specific activities. The teacher also explained that she spent more time with Ron because she was his preferred person.

Although Marty was comfortable in the discussion of forms, she had more difficulty with function. Some of this may have been due to the realization that the child's intent was not necessarily the interpreted function as indicated in her statement, " I don't know if that's the meaning or that's us giving it meaning."

Session 2. In session #2, which was actually a discussion of the first follow-up observation video tape, the researcher initiated twenty-nine conversations with the following breakdown: form (1), function (5), content (3), and context (20). The teacher initiated twenty conversations with the following breakdown: form (2), function (0), content (5), and context (13). Four of the five content conversations included the act of giving voice. Giving voice occurred when the teacher verbalized her interpretation of the messages that her student's sent through body language. The act of giving voice clearly demonstrated the teacher's ability to interpret the body language of her students. There was a marked increase (from two to eight) in teacher initiated conversations about activity and routine, within the aspect of context. Eight of the thirteen total number of context conversations were about activity and routine. Again, the focus was on down time and transitions as a feature of routine. The researcher also supported the teacher to examine levels of student participation in activities.

The researcher broached the topic of noise level, although this had already been done during the observation. The researcher remarked, "What I'm noticing on the tapes, when I review them, is that sometimes we can't hear our own conversations. I can't transcribe parts because the background noise is so high in the room." Conversation also concentrated on down time at lunch. Again the teacher pointed out very specific characteristics of the children. For example: "When her hand moves, her mouth opens." She also engaged in interpretation of student actions. For example:

Marty: Well he's not done yet.

Researcher: No, he's not (agreeing)

Marty: He doesn't want anymore of that juice. He wants something we're not sure of yet.

Researcher: So his message is, "I want something," but nobody knew what it was.

Marty: Yes.

Researcher: So, now, he's protesting

Marty: And this is what I get, protesting.

The teacher demonstrated understanding that student frustration over staff interpretation can result in protest.

The teacher also initiated a conversation about touch cues. "We've made a valid effort to work on the touch cues and to give them." Teacher also initiated conversations about choice and how some things can't be a choice, but that a cue should still be given, communication could still be shared.

The following examples of "giving voice" occurred in this session:

"Nobody's paying attention to me" (in reference to Susie throwing the piano)

"Finished. Finished." (in reference to Ron's body language)

"I'm done with you: ("as child moves away from adult ")

The teacher expressed no concerns about the model or implementation in Stimulated Recall Session #2.

Session 3. In Session #3, the researcher initiated thirty-six conversations with the following breakdown by aspects: Form (5); Function (2); Content (3) and Context (26). Again the researcher focused on individual needs, adaptations and characteristics for eleven of the context conversations. Eight of the researcher-initiated conversations were about activity and routine. The teacher initiated a total of nineteen conversations with the following breakdown: Form (0); Function (0); Content (3); and Context (16). This is the

second session in which the teacher initiated no conversation about function. Within the aspect of context, eight of the sixteen comments were on Individual Characteristics, five were about the physical environment (noise level) and four were about the process of communication, even though the researcher hadn't initiated conversations about process. The researcher reinforced continued to reinforce concepts introduced during the in-service sessions. One goal was to establish a common language with the teacher. Two examples from this session follow:

Researcher: Do you think he knows you and how does he know you?

Marty: Oh, absolutely."

Researcher: And how does he know you?....

Marty: He knows my ring and I've been using my ring almost all year.

Researcher: So that's your referent.

and

Marty: "Cooperating with his game is usually the only way to get him to do something new, so we play his game and then I introduce him to the toy and then we play his game some more.

Researcher: Very van Dijk. Join him in his world. Invite him to yours and return him to his.

Marty: Oh!

The teacher invested a lot of time in talking about the strategies she used to work with Ron. An example regarding turn taking follows:

Marty: Well there's battles until you get to know the child. It was a constant battle with Ron. He was eating me up because I didn't realize his needs. I knew where he was. I felt I knew where he was functioning but I wasn't giving him the opportunity to play his pounding game. It was like, come on we gotta get this done. You have to step back and...

Researcher: You gotta slow things down. You can't always keep him on your schedule.

Marty: Yeah! Yeah! I don't think anyone can do my schedule.

As the teacher discussed these games, the researcher related the importance of this activity to turn taking and later the role of turn taking in conversation. This teacher recognized these turn taking games as a conversation and the researcher supported this understanding of the goal of communication intervention as being to support the child in conversation.-(Hagood, 1994; van Dijk, 1986), as opposed to teaching of discrete messages for specific circumstances.

Stimulated Recall Session Three included the following examples of the teacher "giving voice" to Ron's body language.

> "Mmmm"
>
> "I don't have my tray. I don't have my toys. There's nothing behind me to play with. My hand tastes pretty good but I'm gonna get into trouble for that, though."

The researcher-initiated conversations supported the teacher to focus on recognizing the relationship of whole group transitions and down time. This led the teacher to sharing a change in practice, made to reduce down time.

Researcher:	It takes a long time to make a shift from here to there with that many kids, doesn't it? (in reference to shift from circle time to table area)
Marty:	It's terrible. The transitioning and I haven't. We're working on this. We don't bring them in a whole group anymore. We just put the music on the carpet and we leave all the kids who can eat at the table here listening to music and we've been bringing the rest of them first.
Researcher:	That's great! So that's reducing down time for the other ones. that's great!
Marty:	And we give them things to play with and the music's on and it seems to be helping, but it still takes us two hours to feed.

The teacher also shared her use of tangible symbols to support transition.

Marty made an obvious shift in thinking from concentrating on form alone to examining the physical environment, a component of context. This was evidenced by the physical rearrangement of classroom and comments made in this recall session. For example:

Researcher: Okay, is there anything else you want to add in regard to the Four Aspects of Communication on this last segment?

Marty: Well, I think in all the segments, the physical environment has not been optimal for communication, not for all communication, but for some specific communication.

Researcher: In what ways?

Marty: We have made some changes.

Researcher: Yeah (I knew the room had also been rearranged between last session and this one.)

Marty: Even before looking at the tape, I was thinking, this just isn't working. There's too many kids sitting, doing nothing for too long, and even if they, even having them up and you know, and it gets frustrating because you don't know (when lunches are coming). The transitions take what seems like an eternity.

The following excerpt revealed the teacher's frustration between what she was trained to do at the university and the reality of her teaching situation.

> Yeah and it's so frustrating because we're taught at school (the university) to do a lot of group activities.

She wrestled with her ideas and training about grouping as being beneficial or a best practice and her observations that her grouping practices were creating down time.

Session 4. In Stimulated Recall Session Four, the researcher initiated a total of fourteen conversations with the following breakdown: form (1), function (0), content (0), and context (13). Here again, the emphasis was on Individual Characteristics (a component of context) (4) and Activity and Routine (5). The teacher initiated a total of six conversations. The teacher was not present in the tape being reviewed which may account for the lower levels of initiations and she didn't have the time to preview and select a segment for review, so this session was based on approximately twenty minutes of researcher selected tape only.

Again, the teacher discussed the importance of the games played with Ron. The researcher responded to this by focusing on the importance of turn taking to conversation. She supported the teacher to view these games as a body language conversation.

Marty continued to expand her thinking about context as depicted in the following remarks:

Researcher: So there was a shift today to talking about context.

Marty: Mmmhmm.

Researcher: And you've actually made a lot of changes (meaning the physical environment)

Marty: Yeah, and it's been in the last couple, three weeks.

Researcher: Yeah, you have.

This session included the following example of the phenomena of giving voice in the context of watching Susie physically struggle to move her wrist up onto the table.

"If I can get my wrist up there, I can."

Again, the conflict between what she was taught in teacher preparation and her reality, was evident in this session.

> A lot of its habit. When I was in school, you had to do these artsy things. You have to, you know, the kids have to be engaged in these artsy things. When I was in school. I do think about it and you know what, sometimes, the point is just to do it. I've just decided that this activity has no point (meaning the end product) but we're going to do it."

It was in this session that the teacher first discussed her responsibility to train the paraprofessionals. An excerpt of this rather lengthy conversation reveals her frustrations:

Marty: You have to be observing and you can't be observing when you're up to your elbows in lunch and what you want done. But I mean, it's still going to happen. I know what I want done and I can try to verbalize my wants and you know, I try to model...

Other adult: But they're too busy to watch you model.

Marty: Exactly!

So a concern for the teacher today was the need for more hands to do the job, the desire to have more opportunities to model best practices, and the need for allow for staff training.

Across the Sessions for Site #1

The researcher initiated a total of one hundred and five comments/conversations and the teacher initiated sixty-eight. Twenty-seven of the researcher-initiated conversations were about individual characteristics and needs; twenty-five were about Activity and Routine. Some of the early focus on individual characteristics involved gaining an understanding of participant children. There were no researcher initiated discussions about the process of communication and there were nearly equal number of researcher initiated conversations about form, function, and content (11, 13, and 12 respectively). The teacher initiated sixty-eight conversations, of which nineteen were about Activity and Routine. Eleven were about individual characteristics and also eleven about forms. Both the teacher and researcher shared an interest in individual characteristics. Marty was skilled at noting how individual characteristics affected instruction, as well as on the interpretation of body language.

When looking at the combination of researcher and teacher initiated conversations, 111 of the 173 conversations were about context, with 44 being specifically on activity and routine and 38 being about individual needs and characteristics. In addition, there were twenty-two conversations about form, eighteen about function, twenty-two about content. The 111 conversations about context can be further divided into the components: Activity and Routine (44); Individual needs and characteristics (38); Communication Partners (12); Physical Environment (12); and Process of Communication (5)

The researcher initiated conversations increased sessions one through three, but dropped in session four, as did the teacher-initiated conversations. Much of the conversation in the first two sessions was simply comments about what was being seen on tape. More substantive conversation occurred in sessions three and four. Many of the teacher-initiated conversations were about context, but there were shifts in the nature of her talk across the sessions. The stimulated recall sessions were the only data source that

revealed the teacher's skills in "giving voice," a way of displaying her interpretative abilities.

Stimulated Recall Sessions; Site #2

The data is displayed as described for Site One.

Table #26: Site Two Stimulated Recall Conversations

		S#1	S#2	S#3	S#4	
Form	R	4	4	3	3	R = 14
	T	0	6	2	4	T = 12
Function	R	5	4	0	3	R = 12
	T	1	1	0	4	T = 6
Content	R	4	2	2	7	R = 15
	T	0	4	1	4	T = 9
Context	R	10	9	25	15	R = 59
	T	2	12	8	3	T = 25

Components of Context

		S#1	S#2	S #3	S#4	
Phys. Env.	R	0	0	3	1	R = 4
	T	0	1	0	0	T = 1
Indiv. Char.	R	7	1	5	3	R = 16
	T	0	3	1	0	T = 4
Act. & R.	R	1	5	13	7	R = 26
	T	2	2	3	3	T = 10
Comm. Pars.	R	2	1	4	4	R = 11
	T	0	4	4	0	T = 8
Process	R	0	2	0	1	R = 3
	T	0	2	0	0	T = 2

R = Researcher Initiated Conversations
T = Teacher Initiated Conversations

Session 1. The teacher and researcher were joined by the teacher consultant for the first stimulated recall session only. In this session, the researcher initiated twenty-three conversations across with the following breakdown across the four aspects of communication: form (4), function (5), content (4), and context (10). Seven of the ten context discussions were about Individual characteristics as the researcher gained information about Calvin. The teacher initiated three conversations in Session #1 with the following breakdown: function (1) and context (2). Both of the context conversations were about activities. The teacher's low level of initiation was probably due to the presence of the teacher consultant who served as case manager for the participant child for nine years and possibly also due to her lack of familiarity with the child and the process of stimulated recall.

The researcher focus, for this session, was on facilitating the teacher to read Calvin's body language as represented on the video. This was the first step in getting to know Calvin and would be an important step toward the goal of increased teacher involvement. This thinking was prompted by the following message, "What do you think his message is here?" However, many of the researcher's questions were answered by the teacher consultant, rather than the teacher. The following excerpt depicts one researcher-supported interpretation.

Researcher: Or just when his posture is more erect or like this (slumping). He has several different postures.

Karen: I don't notice his different postures.

Later, after listening to input from the teacher consultant, she added:

Karen: That's when he taps a lot of times. When he taps, he's leaning back."

We were examining postures to clues about his attentiveness, his boredom and his reaction to various activities in this session.

Karen initiated twenty-two conversations in this session, with the following breakdown: form (6); function (1); content (4); and context (11). In this session, the

teacher initiated conversations about each of the components of context with four conversations being about communication partners. The teacher cited the use of tangibles to make an activity more meaningful.

Session 2. In session #2, the researcher initiated nineteen conversations with the following topic breakdown: form (4); function (4), content (2) and context (9). Five of the nine context conversations were about Activity and Routine. The researcher's focus was on supporting Karen in her observations of Calvin. This was particularly important as much of his program was still delivered by the paraprofessional, resulting in him often being physically separated from the teacher. The other concern was to move the teacher to think about forms other than verbalization, for both receptive and expressive use. Karen initiated twenty-two conversations in Session two with the following breakdown: Form (6); Function (1); Content (4); and Context (11). In this session the teacher initiated conversations about each of the components of context with four conversations being about communication partners.

The teacher increased her interaction with Calvin sometime between stimulated recall session #1 and stimulated recall session #2 (even though the in-services had been completed prior to the first stimulated recall session) as evidenced by the following remark:

Karen: I had no idea before working with him so much, that he understood so much.

Researcher: He does.

Karen: Even a couple of months into working with him, I had no idea. I don't think people around the building have any idea.

By this session, the teacher was able to answer questions about not only form, but function as well, as this example demonstrates:

Researcher: Okay, let's think about the four aspects, then, in terms of that segment. Let's see, well, what kinds of forms did we see Calvin use for expression?

Karen: For expression?

Researcher: Mmmhmm.

Karen: Verbal. I think Joan understood some of it. A little bit of, I guess you'd call it gesture and head nodding. He might have done (signed) bathroom. That's about it.

Researcher: What kinds of functions, what kinds of reasons, did he have for communication with Joan?

Karen: He communicated that he had to go to the bathroom. That function would be a request for action (she went from message to function).

This session also included a discussion about Calvin's need to make clear choices. The teacher was concerned about the inability of others to understand his choices.

It was during this session that the teacher mentioned that she, Joan, and Shirley were meeting regarding the communication intervention model. This was initiated by the teacher, Karen. Although the researcher was aware that they were giving input, she didn't realize the formality of the meetings until the post interview.

It was in Session #2 that the teacher began to explore different form possibilities. She asked for clarification of two and three-dimensional forms. She also began to explore the possibility of sign language and for the first time, she was comfortable in speaking directly about the intelligibly of Calvin's speech.

Karen: I like the idea of sign, too, if it could work, because it seems to,

first of all it seems more natural and it seems like it goes with him (eg. his hands are always available-something we discussed in in-service) a lot better. And the other thing, Joan and I have talked about too, it's not likely that there'll be many people who communicate with him and who don't know him anyway. (She's moving into thinking about his likely future partners.) You can't understand it (his speech) even if you work with him. He can come up with his own signs.

Researcher: Yes, he can. In fact, in some other countries they do a lot more with natural gestures than we do and they make it the business of the staff to learn the child's natural gestures.

Karen: That's what I thought too. If he's got a gesture for something, it can be taught.

Researcher: You could make a tape (video).

Karen: Right and I think we've kind of all agreed on that too. The signs he does have we're not going to try to change them and do something different.

Researcher: Okay, so what we need to start thinking of creating-some kind of map or list of the things he has gestures for.

Karen: We've almost done that.

Researcher: Great!

Karen: Joan and I sat down and did that. It helps, I mean sitting down to do the Action Plans because we really talked about a lot of things. We made a list of all the different forms he uses, the different functions and the content of each that he has now.

Researcher: Great! I want a copy of that!

This conversation marked a significant shift in teacher thinking and practice. She had come to know Calvin. At the inception of the study, Karen stated that his speech was unintelligible to her and that perhaps his intelligibility was a feature of knowing him. By session two, she was able to say that his speech wasn't intelligible even to many who knew him. This was an important step as functional communication is interpretable to others (Rowland & Schweigert, 1993). Karen had become involved and taken the lead in planning communication intervention with the Four Aspects of Communication as her model. She was integrating her thinking across all four aspects

Session 3. In session #3, the researcher initiated thirty conversations about the four aspects with the following breakdown: Form (3); Function (0); Content(2); and Context (25). Thirteen of the researcher-initiated conversations about context were about Activity and Routine. The teacher initiated eleven conversations in Session three with the following breakdown: form (2); function (0); content (1) and context (8). Four of the context conversations were about communication partners and three were about activity and routine. Of the thirty-three conversations (teacher initiated and researcher initiated) about context, sixteen were about activity and routine. She also supported the teacher to appreciate the communicative value of Calvin's behaviors. The researcher focus for

much of this session was on what made an activity or a communication intervention worthwhile. The researcher encouraged the teacher to make instructional decisions. Four examples from this session follow:

Karen: Is it of real benefit?

and later:

Karen: Maybe that's why we dropped doing this (the daily schedule), because we lacked a way for it to have meaning.

Researcher: What would it be connected to?

Karen: Yeah.

Researcher: Sure, that makes sense.

Karen: And I think that's been an ongoing problem as we've tried a lot of different strategies. All of a sudden it's like..(pause)

Researcher: What do you do with it?

Karen: Yeah.

and still later:

Karen: I guess, what would be the benefit of that? If he understands our names verbally, what would be the purpose of that? (She was thinking of receptive language, not expressive. Therefore, she was struggling with why it might be important to have objects of reference, or concrete name symbols for Calvin.)

and a fourth example:

Karen: This is probably a good task for him, isn't it? (sharing of a referent book)

Researcher: Mmmhmm

Karen: Fine motor.

Researcher: Tactile, fine motor and listening.

Karen: So, it's the process, rather than the product.

Karen was struggling with the question, "What is worthwhile to teach?" This struggle was partly connected to discrepant views of the child, which was also a topic of conversation in this session.

Although the teacher and paraprofessional had reported that Calvin displayed an excessive amount of tantruming on several of my observations, during this session, she was coming to appreciate Calvin's perspective as exemplified in the following statement made while observing a tape:

Karen: He's really patient isn't he?

Researcher: He's really too patient.

Session 4. In session #4, the researcher initiated twenty-eight conversations on the following aspects: form (3), function (3), content (7), and context (15). Seven of the context conversations were about Activity and Routine, four were about communication partners and three were about individual characteristics. The researcher focus was on the need to develop more lessons, as part of Activity and Routine. She also encouraged staff to initiate the use of a daily schedule. The teacher initiated fifteen conversations with the following breakdown: form (4), function (4), content (4), and context (3). The researcher was more focused on continuing some conversations on context, while the teacher's initiations were evenly distributed across the aspects of communication.

The teacher continued to look at what Calvin knew in greater detail, bringing up questions that were new to the researcher. For example:

Karen: He definitely knows that after that question and the pause, it's his turn.

Researcher: Mmmhmm, and he often gets the number of syllables.

Karen: I wonder though, if you just said statements to him, if he'd still do it.

Researcher: That's a good thought.

and a later conversation initiated by Karen:

Karen: You know what else? We have him model back so much. Like she just said, What is that and he said, "eh eh." She said pencil and he said, "eh eh." So you don't know if he's trying to answer the question or model back.

She returned to this same idea later:

Karen: Because we ask a lot of questions. But then we wonder if it was in fact answering or responding, trying to model. No, we're modeling. Is he trying to approximate what we're modeling?

Researcher: Imitating your model (as opposed to truly answering with understanding.)

Karen: So, we're not sure about that.

Researcher: It's an interesting question. A very good question.

Later she returned to thinking about questioning and its impact on Calvin's communication. This is critical, as questioning was the foundation of the Deaf Education program. The program's philosophy was based on the perspective that through questioning, teachers support language development. This thinking is reflected in her statement, "I'm trying to think of other things he initiated. I don't know. I think we're so busy asking questions all the time, I don't know." She was searching for evidence of what Calvin knew.

A discussion about messages included connections to the demands of signs for those messages. This was followed by a discussion about activities and the meaningfulness of activities. Again, the teacher indicated the need to create more activities that were meaningful for Calvin.

Karen: We try to come up with activities all the time. I think Joan gets bored with them a lot.

Researcher: She's been with him for nine years. I bet she is.

Karen: I think it's hard for her to pull some of that stuff out when they've been doing it for years. And I'm not sure she sees it as meaningful and once you've lost the meaningfulness of it, it's really hard to keep going.

This theme of what constituted worthwhile activities had become central to her thinking about communication intervention. Siegel-Causey and Ernst (1989) found that adults facilitated communication by providing interesting, functional activities. Activities provide a context within which communication occurs. A brief discussion about

intention revealed the teacher's concerns over the use of augmentative communication devices:

Karen: But if you put it on some kind of tape that he would have to hit, how do you know that's ...(pause)

Researcher: Oh! (realizing what she meant) Differentiated from making noise, when he hits it? Is that what you mean?

Karen: Yes.

In addition to revealing her critical thinking about the use of an AAC device and it's connection to intention, the teacher struggled to define a source of evidence for Calvin's skills. Her continued interest in meaningful activities and how we might observe evidence of understanding was again verified as the researcher summarized some ideas about the session:

Susan: So we have issues with initiating and terminating,

Karen: and activities (She changes the subject from thinking about the process of communication back to activities.).

It was in the fourth session that Karen displayed the skill of giving voice. The context involved a classroom staff who left Calvin alone to retrieve materials for a lesson. She left him without an exit greeting. Karen voiced what she saw in Calvin's facial expression, "Where are you?"

Across the Sessions

The researcher initiated one hundred conversations and the teacher initiated fifty-one. The researcher initiated twenty-six conversations about one component of context: activity and routine. Calvin needed more lessons and a predictable routine. She also initiated sixteen conversations about individual characteristics, fifteen about content, fourteen about form, twelve about function and eleven about communication partners. Across the sessions, the researcher only initiated two conversations about the process of communication. The teacher initiated fifty-one conversations with twelve being about

form, ten about activity and routine (one component of the aspect of context), nine about content and nine about communication partners (another component of context).

The teacher and researcher shared a concern about the lessons/activities. This concern was shared by the teacher in Site One. Both teachers struggled with what was sensible to teach. This resulted in the researcher targeting much attention to this component of the aspect of context. Both teachers understood the importance of assessment to instructional decision-making, but were interested in knowing something about the sequence of learning. Much researcher attention was spent focusing them on what outcomes were desirable and working backwards from that point. The researcher focus was on moving the teachers' thinking from the prerequisite, sequential model of development associated with the developmental paradigm, to a functional approach to instruction founded in the functional paradigm. The teachers' perspectives on instructional decisions impacted their ability to create meaningful activities that set the context in which communication can occur

There were a total of one hundred and fifty-one conversations across the sessions, with the following breakdown: form (26), function (18), content (24), and context (83). In looking at the context data, there were thirty-six conversations about Activity and Routine; twenty about Individual Characteristics and nineteen about Communication Partners. There were few conversations about the Physical Environment or the Process of Communication. However, both of these elements were effectively programmed in Site Two. The teacher's initiations increased from only three in the first session to twenty-two in the second session, then dropped to eleven and fifteen respectively for the third and fourth sessions. The presence of the Speech and Language teacher who functioned as case manager and demonstrated expertise in her work with Calvin, likely impacted teacher contribution in session one.

Action Plans: Site 1

The Actions plans were divided into the following sections: "Thinking and Planning"; "Actions Taken"; "Current Concerns" and "Follow-up Requests." Results from the "Thinking and Planning" and "Actions Taken" are included here, in response to Research Question #2. "Current Concerns" and "Follow -Up Requests" reflect the teacher's need for support and are included in response to Research Question #3.

In recording her "Thinking and Planning" on Action Plan #1, Marty made the following remarks:

> Interested in use of tangibles.
> Transition using tangibles.
> Need bathroom symbol.
> Interested in use of tactile representations on AAC device & Wolf Board.

Marty reported the use of three tangible symbols to represent Circle Time, Daily Living Skills & Toileting as "Actions Taken." She used the same representation for all the children who would benefit from such a form of communication.

Marty recorded the following under "Thinking and Planning" on Action Plan #2:

> To have name symbols for each caregiver in the environment.
>
> To develop an object symbol for daily activities to be used in all environments, school, residential setting and home.

Although Marty had developed the symbols for the Daily Living Skills activities, she started using it, as initiated in the "Actions Taken" section of the Action Plan.

Marty recorded the following under "Thinking and Planning" for Action Plan #3:

> To determine the ways each child communicates-give meaning to nonverbal communication, vocalizations and verbalizations (through all environments)

As "Actions Taken," the teacher recorded that she had spent time observing her own classroom, and that in the future she would meet with residential staff and parents. She requested written or videotaped materials on funding opportunities, and follow up coaching on "determining specific communication cycles for Ron and especially Susie."

Marty never turned in a fourth Action Plan and stated that her thoughts and actions were about the same as in Action Plan #3.

All of Marty's remarks under "Thinking and Planning" and "Actions Taken," on the first Action Plan were issues of form. She also requested information on Tangibles, again an issue of form. She also made a request for an article that would be relevant to Individual Characteristics, a component of context. Marty continued to focus on the aspect of form, both in her thinking and actions, as depicted on the second Action Plan. By Action Plan #3, Marty had shifted her thinking to cycles of communication and to the importance of giving meaning to the child's communications. She was thinking about the importance of interpretation, which was surprising, because she was already skilled in interpretation.

Action Plans: Site #2

In recording her "Thinking and Planning" on Action Plan #1, Karen made the following remarks:

Tangible symbols (form)
Answering (function)
Vocabulary selection

She recorded no "Actions Taken ."

The second Action Plan again included entries under form, function, and content. Under form, Karen indicated that she was thinking and planning in the area of sign/s gestures (form), getting people to react to his needs (function) and prioritizing vocabulary under content. Within the "Actions Taken" section, she recorded that she was working on hand positions/shapes/movements (form).

Karen turned in only two Action Plans and also expressed that she didn't fill out a third or fourth as the issues were the same. Both teachers felt that they needed more time to work on thinking and actions already cited. It wasn't necessary to ask them to fill out a new Action Plan every two weeks. This was too frequent to allow for the process of change in teacher thinking and practice.

Field Notes: Site #1

The Site #1 field notes of the post-observations sessions were analyzed according to the four aspects of communication, while watching for additional themes. Within the area of form, it was noted that school staff persisted in using only one form of communication at a time during the course of the study. This often resulted in the communication not being accessible to students. For example, the verbal only messages weren't accessible to Ron because he was profoundly deaf. Accessibility was also reduced for Susie, when staff physically acted upon her, without verbalization, requiring her to interpret their actions. In addition to being an issue of form, this concern also fits under communication partners, within the aspect of context. A second form issue noted during the first observation, was the lack of accessibility due to the use of picture formats with blind children on overlays for AAC devices. Without any tactile markers, and no use of location that was systematic and consistent, Susie really couldn't learn the locations of the represented content.

Most of the field notes of Site One fit within the aspect of context. The teacher was thinking more about the physical environment. The researcher noted Marty's concern about how the physical set up of the classroom influenced the length of transitions between activities. The first video made the connection between these issues explicit for Marty. It seemed that the videos had a greater impact on her understanding of down time than any verbal feedback received on site from either the researcher or Carly, the paraprofessional. She mentioned that she hadn't realized how much down time there existed until she saw the tape. This was understandable because all of the staff were occupied every minute.

Field notes continued to address the issue of down time. The teacher grew in her understanding about how grouping practices create either the opportunity for active participation or passivity. She developed new strategies to cope with late lunches and new strategies for transitions. The teacher's change in grouping practices was noted. She

stopped moving the entire group at once for each activity. She left part of the class in a different area, occupied with an activity, and learned to move only those students that were to be involved in the next activity.

The teacher reflected on the use of the Little Room, which she used for extended periods of time for several of the children. During this time, the children received little, if any staff interaction. It was observed that participant children were left in the Little Room for as long as forty-five minutes. It was also observed that although the goal was to initiate with objects, the children often accidentally activated the movement of the objects. While the researcher thought that there was significance to the fact that children were accidentally being stimulated, the teacher concentrated her thinking on the Nielson approach of leaving children in the room without disturbance. Her knowledge of individual child characteristics informed her thinking. She knew that she could interact briefly with one participant child without disturbing the Little Room experience, but she couldn't with the other. She wondered how this affected the intended purpose of the Little Room experience.

The teacher's time, throughout the study, continued to be spent primarily with Ron.It wasn't until the calculations of interactions across the sessions were completed, that the researcher realized that Ron was getting a lot more staff time, across all three staff, than Susie.

The teacher started to think more actively about training needs and what she would do if she started all over again in the beginning of the year. She thought about how to take the principles of the model and apply them to her next class. Marty has already been informed that she was to be assigned to teacher a classroom of children with autism. She sought to extend what she had learned in her work with a new population.

Field Notes: Site #2

Field notes for Site #2 were also analyzed and results were organized within the framework of the four aspect of communication, while watching for emerging themes. Field notes again discussed concern over the use of the oral form as a primary expressive form for Calvin. His receptive language was noted to be much higher than his expressive. The researcher also noted concern about how his etiology of Adrenoleukodystrophy would change his form needs over time. She moved from trying to fit Calvin into oralism and the deaf curriculum as others had done before her, to paving the way to look at a new primary expressive form and a different curriculum. Others had considered additional forms for back up, but she was the first to clearly say that the verbal form wasn't going to be an effective, primary expressive form for Calvin. She was correct.

Field notes about function included the use of extensive questions by staff and the high level of student answering in response to those questions. This may have been contributing to student passivity.

Under discussion of context features, it was noted that Karen was actively thinking about "what to teach" and "what made a good task." While she struggled with the question of what was worthwhile to teach, she valued case study examples and was able to apply what was appropriate from those studies, viewed on tape, to Calvin's programming. Karen found it difficult to include Calvin in group instruction. She didn't feel that her classroom best suited his needs.

The most significant change noted in Karen's teaching behavior was her change in roles. She became not only a more frequent communication partner with Calvin, but she enjoyed more sustained interactions, as evidenced by the number and length of interactions. In addition, she gradually assumed the role of instructional leader, much to the relief of the paraprofessional. She assumed this role, while initiating more extensive, formal, collaborative efforts with both Joan and Shirley. This remarkable shift in teacher

role was important because the paraprofessional had communicated to the researcher, that this would be her last year working with Calvin. So, after nine years, there would be a new paraprofessional, and the teachers would not be able to be so dependent.

Karen needed support in understanding how the model could be used, specifically with Calvin. There was a tension between the researcher's goal of providing her with a model and supporting her learning and her desire for the researcher to tell her what to do with Calvin. Karen wanted immediate results. She wanted to see the efficacy of the model play out with student performance, quickly. She often talked about what was tried before the study and how it didn't work.

An additional theme on the importance of team support emerged from examination of field notes. Karen initiated team meetings after the in-services were completed, and later stated she wished they had done team meetings earlier in the year, as they had done in previous years. Karen, Joan and Shirley had collaborated on content maps for Calvin and then analyzed what functions these messages were fulfilling. Karen made integrated use of the model's features from the beginning, which may be one explanation as to why she felt some frustration and confusion in the beginning of the implementation. However, she demonstrated understanding of the integration of the aspects by the end of the study. She moved into using the integrated model, even though the researcher had encouraged each teacher to choose an area of focus. It was not anticipated that either teacher would focus beyond one or two aspects given the length of the study. It was apparent that the team meetings, in which the Action Plans were used to frame discussions, were important to Karen's ability to integrate the aspects.

Another theme emerged and was entitled by the researcher as "connecting the literature base on teacher learning to deafblindness". Two issues were cited in the field notes. The first was connected to the literature on teacher change that indicates that learning communities can support teachers in making changes in practice. Since teachers of children who are deafblind are a small population, dispersed by great distance, how

can we form learning communities to support them? Could technology play a role in the establishment of such communities, and if so, might technology alter collaboration?

The second concern within this same theme connected the literature base on teacher's use of an innovation to the field of deafblindness. Field notes also cited the need to consider what was unique about intervention in severe disabilities and what that might mean to supports. If teachers connect both their initial interest in an innovation and their continued interest or belief in its worthiness, to its effect on student learning, as cited by Englert and Tarrant (1995); Englert, et al. (1993); Fullan (1991); Guskey (1986); and McLaughlin (1990), then the field of deafblindness has a unique concern. Learners who are congenitally deafblind develop at a slower rate, thus student demonstration of the impact of an innovation is delayed. Over the course of the study, the researcher made this connection to both teacher and paraprofessional discussions in Site Two. They often cited the many attempted interventions that failed. When probed about these attempts, it often seemed that the interventions lacked consistency and were attempted for only brief periods of time. The lack of immediate effect on the learner had caused staff to move on to the next strategy. This delayed impact on student performance, speaks to the need for additional, more sustained support for teachers of learners with deafblindness. This same frustration was not evident in Site One, possibly because the teacher was prepared in the area of mental disability and was accustomed to the need to persist for longer periods.

Across Data Sources Summary of Research Question #2: How will teacher's communication intervention models and practices change as a result of an in-service with follow-up coaching approach utilizing the Four Aspects of Communication model for communication intervention?

Each of the methodologies, relevant to the second request question, revealed unique information. The post-in-service interview verified the teacher's shift from thinking about forms to the physical environment. It also revealed her way of viewing the category of individual characteristics. The post-in-service interview made the nature

of the team involvement in Site Two more apparent to the researcher. It was this data source that exposed the team's concentration on all four aspects very early in the study.

Examination of the follow-up observation sessions, in relation to the pre-in-service observation session revealed that both teachers tended to communicate in verbal forms alone and that combining forms in a deliberate way to make communication more accessible was difficult. Frequency counts of teacher and student use of forms and functions, as well as the specific content could only be revealed through examination of the video evidence of observation sessions. This source clearly displayed Marty's high levels of attention to Ron and low levels of attention to Susie. It also revealed how Karen's frequent use of questions resulted in Calvin's more passive function of answering as a primary function. The observation data also revealed that while teacher's tried out new forms, they were not able to make a marked shift if their ability to alter their use of forms or functions during the length of this study.

The stimulated recall sessions revealed that Teacher One, Marty, began the study with an exclusive focus on forms of communication, connected to her knowledge about technology. As the study progressed and she viewed her practice on video, she became more concerned with the physical environment and with activities and routine, both components of context. Her interest in these components was evident in the Stimulated Recall sessions and in her changes in practice as noted in the observations. Marty's concerns with activities and routine were concentrated on how grouping and transitions impacted "down time," which she sought to reduce. She initiated many conversations about individual student characteristics in the Stimulated Recall Sessions and used this information in her daily practice. As Marty learned new strategies, she sought ways to teach them to the paraprofessionals, but lacked a structure that supported her with opportunities to model new practices.

The stimulated recall sessions also displayed Karen's uncertainty about where to begin intervention, as did the pre-in-service interview. She struggled to apply what she

knew as a deaf educator, but believed that it didn't fit Calvin's needs. Karen grew to acknowledge Calvin's speech as largely unintelligible and to discuss this with others within the oral program. This involved some risk taking on her part. Karen increased the frequency and duration of her interactions with Calvin. She actively sought to understand how he was currently functioning. She initiated team meetings to reestablish a collaboration that had existed in previous years. She used team meetings to plan communication intervention, with the Action Plans depicting the four aspects of communication, as a guide. This team effort supported Karen in integrating all four aspects of the communication intervention model, very early in the study. Evidence of her ability to integrate all four aspects emerged in the Stimulated Recall Sessions, Action Plans, and in the final interview. Although the paraprofessional continued to deliver most of the instruction to Calvin, Karen took more of a leadership role in determining what his program would include. Karen initiated many conversations about activities and routines within the Stimulated Recall Session. She thought deeply about what was wise to teach and sought support to make such decisions.

The stimulated recall sessions revealed Marty's ability to "give voice" to the body language of her students. She demonstrated this ability early in the study. Karen displayed one occurrence of this behavior in the final stimulated recall session. It is possible that the process of giving voice became possible only after Karen had invested time in knowing Calvin, in observing his ways of communicating, and in observing the researcher demonstrate specific skills.

Both teachers used the Action Plans to make requests of the researcher. The Action Plans were a communication device between the teacher and the researcher. Karen used the Action Plans to frame discussions with the team, resulting in a written document that included input from others.

Field notes revealed the researcher's focus that was brought to each on site observation session and stimulated recall session. For example, the researcher's thinking

about Calvin's need for a different primary expressive form influenced the teacher's thinking given that she was already somewhat dissatisfied with the nature of his expressive communication.

Research Question #3: What supports do teachers need to integrate the Four Aspects of Communication intervention model into daily practice?

The pre-in-service interview, post interview, written action plans, stimulated recall session scripts, and field notes were all relevant data sources to question #3.

Interviews: Site #1

In the Pre-in-service Interview, Marty cited both modeling and in-servicing of staff as important supports to using a new approach or skill. However, when asked what supports were most helpful to her work in the Post-Interview, Marty cited follow-up coaching as being the most valuable, while also sharing that the Action Plans weren't particularly useful to her.

> Well, definitely being on site. Having an idea and being able to bounce it off you while you're here makes it easier than writing down in an Action Plan, is not really, I'm not sure I filled them out the way you wanted me to.

Marty clearly preferred to raise issues on site, rather than to record them on a written form. She explained that she had filled out the Action Plans by herself. This may have resulted in her regarding them as an exercise to fulfill the requirements of the study rather than to enhance her own thinking and practice. Completing the Action Plan, in isolation, reduced its impact.

Marty indicated that she could continue to implement the model independently and that the classroom staff would at least feel comfortable with it by June. She also expressed concern about whether others would follow through. This was particularly relevant, as she had found out that the children were to be moved to a new district program.

When asked what supports she needed to continue to implement the model, she cited money and time. Marty explained that the money would be used to buy supplies and equipment. Marty's concern that the lack of money and time would interfere with implementation is shared by other teachers (Englert, et al, 1993; Richardson, 1990). She stated that implementing the intervention in the beginning of the school year would be easier. She also indicated that she would use it this summer with a class of autistic children she would be teaching.

Interviews: Site #2

In the Pre-Interview, Karen discussed the need for someone to follow-up with her and the need for follow through at home as important supports. When asked which of the follow-up supports had been most helpful, during the Post-Interview, Karen shared the following response:

> Probably the opportunity it provided to break it down. Communication is such a big thing and I think what this model did and being able to talk about-it broke it down into kinds of chunks that we could kind of dive into and explore and talk about and decide as a group, Shirley, Joan and I and yourself. And I think just having the opportunity to divide this into chunks that were....okay, here are some different functions of communication. What content can we put in for initiating? What content can we put in for labeling? What content? Okay, now we have these ideas. Now what form can we use? What would be successful for Calvin? What would be successful for us? What would help him communicate? It gave us an approach. It was broken down into pieces we could understand and work with.

The Four Aspects of Communication intervention model gave Karen an approach. Her response also indicated the value of collaboration with team members on communication intervention. The teacher, paraprofessional and speech and language teacher were all part of a larger community of learners, the deaf education program faculty. This condition existed prior to the study. When the study began, the researcher simply became an addition to this small community of learners, all of whom shared an interest in Calvin's learning.

In response to being asked what continued supports she needed to implement the model, Karen indicated the need for someone to check on her progress so that she wouldn't revert to previous practices that were more familiar and comfortable. She also cited more modeling as being helpful and the need for suggestions.

Interview Summary

This study supported Joyce and Showers (1980) contention that modeling was important to change in teacher practice. The written Action Plans were only useful to Karen. She used them as a format to structure conversations about communication intervention in which Joan and Shirley also participated. Karen cited the importance of other on-site professionals and the researcher to the intervention efforts. She referred to "group" efforts. Because Karen had worked with these colleagues for five years and often shared ideas, there was more of a sense of a learning community in Site Two. This established the "shared knowledge" and "shared language" discussed by Shumm and Vaughn (1995) as being important to teacher change in practice. Karen shared the videos, the Action Plans and her thoughts with the other members of the team. She shared ideas as part of the instructional decision making process, whereas Marty made her instructional decisions alone and then sought to train staff.

This notion of "learning community" may also account for the difference between how Karen implemented the new innovation and what is generally cited in the literature. Karen did not choose to implement one facet of the model at a time, but integrated the aspects of the model from the beginning of the study. The influence and support of the learning community, a community that extended beyond just the teacher and researcher, was instrumental in supporting her to take on more pieces of the model. The voluntary nature of teacher participation, coupled with the support of her learning community may also account for why Karen was able to move beyond the lower levels of

concerns as developed by Hall, Rutherford, Hord, Huling and Austin (1984) and move into the level of concern characterized as "collaboration."

Action Plans were provided for several purposes. The first purpose was to distinguish teacher thinking from teacher actions. Second, teachers could request modeling, coaching, and additional materials from the researcher. Third, the Action Plans provided a place for teachers to express their concerns about the model, thus providing the researcher with the opportunity to address those concerns. Data for the second and third purposes are relevant to the third research question. Information recorded by Marty, the teacher in Site One follows.

Action Plans: Site 1

Action Plan #1:

1. Written or videotaped materials on how to develop tangible systems
2. Follow-Up Coaching on everything (Actin Plan #1);

Concerns:

None listed

Action Plan #2:

1. Written directions on tangible pages

Concerns:

1. Encouraging follow through with staff, residential site and home (Level 3)
2. Individualizing tangible symbols (Level 4)
3. Implementing individualized tangibles effectively (Level 4)
4. Time Constraints (Level 3)
5. Unsupportive Administration (Level 2)

Action Plan #3:

1. Written materials on funding opportunities
2. Follow-up coaching to determine specific communication cycles for participant children.

Concerns:

1. Unsupportive parents (Level 2)
2. Follow-through (Level 3)
3. Time (Level 3)
4. Carry-over (Level 3)

Marty requested written materials, videotaped materials and follow up coaching. Her concerns fit within levels two to four on Hall et al's (1973) scale. The lack of parental and administrative support raised personal concerns (level two), while her level three concerns were regarding efficiency due to the need for consistency within and across environments. She also moved into level four as she struggled to individualize and create new meanings from what was learned in the in-services.

Information recorded by Karen, the teacher in Site Two follows.

Action Plans Site #2

Action Plan #1:

1. Written or videotaped material on tangible communication
2. Talk with researcher or another teacher about carrying over strategies used at school to home environment
3. Clarification of the fours aspects of communication and how they apply to Calvin, the staff that work with him and his family.
4. Follow-up coaching on Calvin's specific needs and strategies at best meeting those needs.

Concerns:

1. How to prioritize the content and context for Calvin's diverse needs and daily interactions. (Level 4)

Action Plan #2:

1. Written or videotaped materials on paraprofessional working with Calvin
2. Talking with researcher or another teacher about 3 dimensional tangibles vs. 2 dimensional tangibles and sign/gesture system
3. Follow-up coaching on sign and gestures.

Concerns:

1. When introducing new forms such as computer, tangible systems and a voice box, Calvin seems to get confused and frustrated. He stops using the verbal skills he does usually use to communicate. (Level 4)

Karen requested written materials, videos, discussion and coaching. Her cited concerns were about how the innovation would impact on outcomes for Calvin. This is a level four concern according to the Hall, et al. (1973) scale.

Action Plan Summary

Follow-up coaching was important to both teachers. Most of the opportunities to discuss interventions actually occurred during the Stimulated Recall sessions. This happened because both teachers were extremely occupied throughout the day and it was often difficult to discuss teaching practice without interfering with the teacher and student interaction. The teachers may have thought of the Stimulated Recall sessions as an extension of the on site coaching because the sessions were held on the same days as the on site visitations. Karen used the Action Plan to request the opportunity to talk with the researcher about a specific topic. Neither teacher requested more Stimulated Recall time. In addition to citing the importance of on site interactions with the researcher, Karen wanted clarification of the model and how it specifically applied to Calvin.

Both teachers moved beyond what typically would occur in the implementation of a new innovation. This can be accounted in part by the voluntary nature of the study. In addition, both teachers were dissatisfied with their current communication intervention practices for participant children and both had the desire and willingness to make changes in practice, cited by Fullan (1991) as being the critical first step to trying a new

innovation. Strategies within the model were also somewhat familiar to the teachers, although the structure of the model and many of its components were entirely new. Level Two, personal concerns were likely reduced since the teacher was asked to choose how she would implement the model. Her use of the model was discretionary.

While Karen never expressed any concerns about implementation of the model during Stimulated Recall Sessions, Marty, the teacher in Site #1 cited the following: challenges with accessing equipment and her frustrations over funding for equipment (Session #1), need for more help in the classroom (Session 3), frustration with trying to train everyone (Sessions #3 and 4), and lack of administrative support (Session 4). Although she had been directed by her administrator to have meetings about child needs she expressed the limits of this approach in remarking, "It's not enough to talk about it in meetings. It needs modeling and on-site feedback and they're all too tied up" (Session 4). The rapid pace of instruction and the lack of administrative support were also cited by Englert, et al., (1993) and Richardson (1990). Teachers' concerns about the innovation may have been reduced due to the voluntary nature of their participation and the fact that each selected her point of entry to the model.

Field Notes: Site #1

One field note was relevant to the need for continued support. Marty was informed that she wouldn't be returning to the school and that the children were being transferred to another program the following fall. Providing for continuity would be a matter of sending the materials to the next program and collaborative transition. She collaborated with the teacher consultant in visual impairment, who would still be serving the children in the new setting, and she sent small portfolios about each child, including information about their communication.

Field Notes: Site #2

A field note regarding Karen's initiation of team meetings was recorded. Karen mentioned that monthly team meetings had been used in previous years to support Calvin's programming. She also said she wished they had held more meetings this school year. Karen had mentioned that the Action Plans were the impetus to initiating the team meetings. Field notes were also made concerning Calvin's etiology, Adrenoleukodystrophy. The degenerative nature of this disorder became apparent during the course of the study. The researcher made notes about the patterns of inheritance and the implications of this disorder on the child, family, and school staff. Adrenoleukodystrophy will cause Calvin's disabilities to change over time, necessitating ongoing evaluation of each of the aspects of communication. Every aspect of his communication intervention should be expected to change over time. For example some forms of communication that work well for Calvin now will not be functional for him in the future.

Across Data Source Summary to Question #3: What additional supports do teachers need to integrate the Four Aspects of Communication intervention model into daily practice?

The teachers chose to implement the Four Aspects of Communication model in different ways. Marty focused on form and then context, with an emphasis on individual characteristics, activity and routine. Later in the study, she focused more on the physical environment. Her emphasis was exposed in the stimulated recall sessions and by her comments and actions in the observation sessions. Karen thought about and implemented across the aspects, but had the benefit of a stronger learning community that shared in instructional decision making. This was revealed in the post-in-service interview. The model's flexibility gave way to each teacher's need to use the model in their own way. This was in keeping with Pugach and Johnson's contention that the process of change is slow and highly individualized. The teachers were unique in how they implemented the model, and were also unique in the types of support they preferred. Both teachers valued

coaching and reflection. Teacher reflection was primarily supported by the videotapes and discussion of those tapes that occurred during the Stimulated Recall sessions. Anning (1988) and Shulman (1986) spoke of the importance of providing time for reflection and its connection to effective staff development approaches.

The teachers in this study moved beyond the early stages of Hall et al. (1973), as reflected in their post-interviews and in the Action Plans. This can be accounted for by the voluntary nature of their participation in the study. Both teachers were dissatisfied with student progress and their current instructional approaches. Teachers, in both sites, possessed some of the skills, such as recognition of the importance of communication partners in Site One, the use of turn taking, and the value of sustained interaction in both sites, which may account for why teacher's didn't stay longer at the awareness level (0) or informational level (1). Both teachers expressed several concerns regarding management, specifically issues of efficiency. Marty, made the instructional decisions and approached consistency as an issue of training the paraprofessionals in her room. Karen approached decision making as a team effort involving the paraprofessional, speech and language teacher and the researcher. In the beginning of the study, the paraprofessional was the instructional leader for programming for Calvin, but after the in-services, the teacher took the initiative to get the group together and gain input from others. Marty took the initiative to share the model in collaboration with management staff at the residential site and with one consultant in the new school program in the fall, for the purpose of a smooth transition. Marty and Karen demonstrated thinking and behavior at Level 5 of the Hall et al. model, and collaborated with others to use the innovation to better meet student needs. Both teachers demonstrated emerging thinking about the final level of refocusing (level 6) by the end of the study. Marty had already made plans about how to use the model in her summer teaching with children with autism, as revealed in the final stimulated recall sesson. In the post-in-service interview, Karen provided feedback that although the diagram of the model supported thinking

about integration, she would also like to see it presented in a linear form to support teacher thinking. She also suggested that the researcher consider developing questions to think about within each aspect of the model. In this way, the teachers could examine a list of questions regarding the four aspects and the five components of the aspect of context. She suggested that a checklist based on the entire model would be useful.

CHAPTER FIVE

CONCLUSIONS AND IMPLICATIONS

Summary

The paucity of teachers, prepared to teach children who are deafblind, created the need for an efficient approach to intervention. An in-service series with follow-up coaching approach was used to deliver the researcher-developed reconfiguration of The Four Aspects of Communication. Best practices in communication intervention, drawn from the literature in deafblind education, were embedded into the model's structure. The model emphasized the interaction between the four aspects: form, function, content and context. The non-linear format supported teachers to select their point of entry into the model, based on student need and their current knowledge. The in-service and follow-up coaching approach to presenting the model and its component strategies was one that integrated the literature on best practices in staff development with the literature on teachers and the process of change. Stimulated recall sessions and on site coaching were provided as follow-up supports. A brief summary of conclusions for each research question are presented below.

Research Question #1: What are teacher's communication intervention models and practices for children who are congenitally deafblind?

Both teachers applied their previous knowledge of communication intervention with the study children. Teacher One, Marty, applied her extensive knowledge of technology, including augmentative communication devices. So, for Marty, form was the aspect that she most related to, prior to intervention. Although she did not articulate her extensive knowledge of individual students, it was evident in the review of the pre-observation tape that she had detailed understanding about how each child's characteristics impacted on learning. Teacher Two, Karen, was prepared as a deaf

educator. She used what she knew about communication intervention with deaf children, while adding what she was learning about blindness in her pre-intervention communication programming. Both teachers used the verbal form alone for most of their expressive communication and more than half of Karen's functions of communication were for the purpose of questioning, a basis of the deaf oral language approach in her school. Paraprofessionals played important roles as communication partners in both environments and served as the primary communication partner for two of the three study children. The pre-in-service interviews revealed that although the teacher's felt the strategies they used were effective with some of the children in the classroom, neither was satisfied with their current communication intervention strategies in relationship to the children in the study. Both teachers described themselves as being "overwhelmed" by the need to support the communication development of the deafblind students.

Research Question #2: How will teacher's communication intervention models and practices change as a result of an in-service with follow-up coaching approach utilizing the Four Aspects of Communication?

The teachers chose to implement the strategies from the Four Aspects of Communication intervention model in unique ways. Their own knowledge base determined their pre-intervention instructional decisions. Following the in-services, teachers made choices directly connected to what they perceived to be the student's greatest needs. In short, their choices were sensible in the context of the study children. This was in keeping with Pugach and Johnson's (1995) contention that the process of change is highly individualized.

Teacher One, Marty, began the study with her interventions completely focused on forms of communication, with an emphasis on augmentative devices. As the stimulated recall sessions revealed, she had concerns about the physical environment, but the opportunity to view her practice on tape served as the impetus to "doing something about" the physical arrangement of her classroom as a strategy to supporting increased

interaction. She grew in her interest in activities and routines, another aspect of context, during the life of the study, as exemplified by the number of stimulated recall conversations, initiated by Marty, that focused on that component of context. Much of her interest in activities and routines was centered on her concern about "down time," which was evident on the observation tapes. Marty used her extensive knowledge about the individual characteristics of the study children in her work. She "spread" knowledge about changes in communication intervention, by first mastering a new practice and then teaching it to the paraprofessionals in her classroom.

Teacher Two, Karen, struggled to apply what she knew about deaf education, but felt that it was inadequate. Over the course of the study, she was able to articulate that the student's speech was largely unintelligible, an assertion that involved some risk taking in the context of an oral deaf education program. Karen markedly increased her interactions with the deafblind student and gradually assumed the role of instructional leader. She initiated many conversations about what constituted a worthwhile activity. Karen used the paraprofessional's extensive knowledge of the student to build her own skills as she collaborated with the paraprofessional and speech and language consultant to improve programming. This team effort may account for how she was able to integrate the application of all four aspects following the in-services. The team used the Action Plans as a planning tool and the teacher believed that this also supported them in integrating the aspects, as she described in her final interview. New practices came to life through the collaborative efforts of the team.

Research Question #3: What supports do teachers need to integrate the Four Aspects of Communication intervention model into daily practice?

Both teachers were unique in how they applied the knowledge gained from the communication intervention in-services and follow-ups. They were also unique in what they found to be most helpful to their work. It is interesting to note that both teachers in this study moved beyond the early stages of teacher concern as described by Hall et al.

(1973). This may be due to the voluntary nature of their participation, coupled with their readiness to make changes in practice. Both teachers were able to apply principles and strategies drawn from the in-service sessions. Both found the practice of stimulated recall to be useful to their thinking. Both enjoyed the on site coaching aspect, although they used the researcher in different ways during those sessions. Marty did not find the Action Plans to be useful, whereas Karen used them as a structure for team discussion and planning, which helped her to integrate the aspects of the model. It was apparent that the Action Plans had little impact on Marty, but played an important role in Karen's ability to integrate the aspects of the model. Marty cited administrative support, parent support and consistent programming across environments as being important to her work and as areas of teacher concern. These supports were already in place in Site Two. Karen shared her need for someone to "check in" with her to monitor progress as being an important support to her, while Marty felt able to implement independently by the end of the study. Marty was already planning how to apply the model to her next classroom that included children identified with autism. Both teachers found modeling and the opportunity to ask questions on site to be helpful to their work.

Significance of the Study

This study demonstrated that teachers were able to use the Four Aspects of Communication intervention model to make changes in thinking and instructional practice. The development of the intervention model used in this study incorporated a synthesis of the literature on best practices in communication intervention for learners who are congenitally deafblind. This synthesis was structured within an interactive model, presented in a visual format that was understandable and manageable to teachers. The model was useful for teachers who had been trained in different areas of special education, one in mental disability and the other in deaf education. The flexibility of the model, combined with the collaborative follow-up support and the researcher's emphasis

on teacher choice, resulted in teachers choosing their own point of entry to the model. Their choices were connected with their individual professional background knowledge and the needs of the study children.

This study contributed to our understanding of how teachers make changes in thinking and practice. The approach used in the study, in-service with collaborative follow-up supports, provided information about how teacher's approach the implementation of a new innovation and contributed confirming evidence to the literature base on teachers and process of change. Modeling and on-site feedback was essential to the application of theories and instructional practices presented in the in-service. Teachers required support in understanding how the ideas presented in the in-service applied to the individual children in their classrooms.

In addition, this study supported our understanding of how various qualitative methods contribute unique information and understandings within a case study. In this study, observations yielded rich information about the context of instruction, whereas the interviews revealed teacher thinking and understandings about communication intervention. The stimulated recall sessions exposed how teachers thought about their own practice. These sessions provided teachers with a powerful opportunity to step out of their teaching role and observe their own practice and student learning on videotape. It also provided them with a rare opportunity to view the practice of the paraprofessionals in the classroom. This was particularly critical for these teachers had no opportunity to observe their own classrooms. The stimulated recall sessions were the data source that revealed the teachers in the act of "giving voice," perhaps an important marker of a teacher's ability to interpret the body language of another. The stimulated recall sessions were also the most significant source of data to looking at teacher thinking and its connection to practice. The interviews efficiently defined teacher's knowledge about specific concepts, like communication and deafblindness, and offered the teacher an opportunity to organize and frame her knowledge, both prior to and following the

intervention. The Action Plan was also important to the framing of knowledge and proposed new instructional strategies for Site Two only.

Implications for Teaching and Consultation

Only 6% of the children who are deafblind have access to a teacher or consultant who is educated in the needs of deafblindness. There is a need for a flexible communication intervention model to provide support to teachers who are not trained in the area of deafblindness. There is also a need for an efficient approach to delivering that model that embeds best practices in effective staff development and knowledge about the process of teacher change. It is unlikely that in-service preparation models can provide long term follow-ups given the paucity of professionals prepared in the area of deafblindness. This study provides consultants within the state deafblind projects and teachers with both a model and an approach that may be useful to their work with practicing teachers. The model may also be relevant to preservice teachers, providing university instructors with a structure within which to organize their discussion about communication intervention and best practices in deafblindness.

The expanded Four Aspects of Communication intervention model can also be used as a structure for informal assessment based on extensive observation. Assessment notes can be organized using the four aspects as a structure. The assessment can be followed by staff preparation in the model to enhance understanding of the assessment and to support instructional planning.

Limitations

The size of the sample, two teachers and three students, is a limitation. Future studies will need to confirm the usefulness of the model to greater numbers of teachers, trained in additional disciplines. Generalizability is limited until further studies confirm the usefulness of the model to a larger population and its impact on student learning.

The observation period of two hours per session is also a limitation. The times of observation were not randomly selected. The teacher selected the day and times of the observation. It is possible that this segment of the day was in some way atypical.

Reliability measures, such as the establishment of interrater reliability, were not performed using the coding procedures for any of the data sources. Instead the researcher accounted for data collected in each source and ensured a fit between the data and the established and emerging themes, as described by Bogdan and Biklen (1992). Even though each item of data was accounted for, there is possibility that the use of one researcher may have influenced the results.

Implications for Future Study

This study furthered our understanding of how teachers think about and practice communication intervention with children who are congenitally deafblind. The efficiency of in-service was combined with collaborative follow-up supports to fit the context of the lack of professionals trained in deafblindness. The knowledge gained from this study can be extended by future studies examining how pre-service teachers learn about communication intervention, as well as to support the in-service education of teacher consultants serving children who are congenitally deafblind. The model may also be extended to populations other than teachers of children who are congenitally deafblind, such as teachers who work with children with severe mental disability, autism, and severe/multiple disabilities.

This study demonstrated the importance of activity and routine to establishing the context in which communication occurred. The question of what to teach is a critical one. Additional studies about how teachers make such decisions are needed. Specifically, studies looking at the role of teacher's instructional paradigm are needed. Teachers' implementation of any new theory and associated instructional practices may vary in relationship to their own instructional paradigm. Teachers functioning within a

developmental paradigm may well differ from those functioning within a functional paradigm, in their instructional decisions. Matching or differing paradigms may also affect the collaboration of the researcher and teacher. It is possible that some teachers may benefit from a reshaping of the order of in-service used in this study, with intervention on the process of instructional decision making or context being the initial topic of discussion.

There is a need to look at the acquisition of the early functions of communications within the congenitally deafblind population. Although there is some evidence to an order of acquisition for deaf children, there is no such evidence for the congenitally deafblind population. It is possible that the extensive range of vision and hearing loss, coupled with varied cognitive functional levels may interfere with the identification of an acquisition sequence or it may simply not exist. Still, the effect of both vision and hearing loss on the acquisition of early functions of communication warrants investigation.

The phenomena of teachers giving voice to the body language of students who are deafblind is worthy of further investigation. The process of giving voice may be an indicator of the teacher's skills in interpreting student body language. It is also a way to provide information unique to an individual child to professionals who may not be as familiar with the child. The purposes of giving voice and its potential role as a modeling technique warrants further investigation. Videos make the process of giving voice explicit and may be an important part of preparing teachers to work with children who are congenitally deafblind.

Studies about teachers and how they make decisions about instructional change point to the strong connection between teacher's concern with student progress and the adoption of a new practice. Teachers adopt what is immediately useful and only persist with practices that result in student progress. This presents a unique problem to the field of deafblindness, as well as to the broader field of severe and multiple disabilities. There

is a need for studies focused on the identification of additional support strategies that could support teachers of the deafblind to persist in practicing a new innovation, given the slower rate of student progress.

Studies about teacher change and teacher learning have indicated the importance of a learning community. Teacher learning communities consist of professionals who share an interest in implementing a particular innovation; yet, they may differ in their expertise in the innovation, thus providing novice teachers with the opportunity to have a mentor. This raises an important question for low incidence populations. How can teachers of learners who are deafblind create learning communities? These teachers are usually disconnected by geographic distance and are often the only person in their school or district struggling to apply a new practice. There is a need for studies to examine how the feature of a learning community can be established through the use of technology or by extended collaboration with general educators and other special educators to the population of teachers of children who are deafblind. Flexible models of intervention, relevant to the broader population of students with severe and multiple disabilities, including children who are deaf or blind, may enhance the teacher's opportunity to be part of a larger learning community.

APPENDICES

APPENDIX A

IN-SERVICE EVALUATION FORMS

FOUR ASPECTS OF COMMUNICATION

In-service Evaluation-Session I

Instructions: Please circle the number which best expresses your reaction to each of the items on the following list. Space is provided for comments.

USEFULNESS OF TOPICS COVERED:

	Useful					**Not Useful**
1. Effects of deafblindness on learning and communication:	7	6	5	4	3	2	1
2. Sequence of communication	7	6	5	4	3	2	1
3. The model: Four Aspects of Communication	7	6	5	4	3	2	1
4. Presentation of Forms (Objects, textures...	7	6	5	4	3	2	1
5. Selection of forms	7	6	5	4	3	2	1
6. Using the child's forms	7	6	5	4	3	2	1
7. Form applications: Name symbols, Anticipation Shelves and Referent Books	7	6	5	4	3	2	1

8. Activity

7 6 5 4 3 2 1

Excellent **Poor**

9. The organization of the presentation was:

7 6 5 4 3 2 1

Clear **Vague**

10. The session objectives were:

7 6 5 4 3 2 1

Comments:

FOUR ASPECTS OF COMMUNICATION

In-service Evaluation-Session II

Instructions: Please circle the number which best expresses your reaction to each of the items on the following list. Space is provided for comments.

USEFULNESS OF TOPICS COVERED:

	Useful						**Not Useful**
1. Sharing thinking & practice since Session I:	7	6	5	4	3	2	1
2. Functions of Communication:	7	6	5	4	3	2	1
3. Creating opportunities for children to acquire early functions (setting up situations, use of matrices):	7	6	5	4	3	2	1
4. Activity-embedding form and function:	7	6	5	4	3	2	1
5. Teacher content:	7	6	5	4	3	2	1
6. Choosing vocabulary	7	6	5	4	3	2	1
7. Maps and ecological inventories	7	6	5	4	3	2	1
8. Context: physical environment:	7	6	5	4	3	2	1
9. Context: individual's needs & adaptations	7	6	5	4	3	2	1
10. Context: activities & routines	7	6	5	4	3	2	1

11. Context:
Communication
partners

Useful						**Not Useful**
7	6	5	4	3	2	1

12. Context:
Process of
communication

Excellent						**Poor**
7	6	5	4	3	2	1

13. The organization of the presentation was:

Clear						**Vague**
7	6	5	4	3	2	1

14. The session objectives were:

7	6	5	4	3	2	1

Comments:

APPENDIX B

IN-SERVICE EVALUATION RESULTS

APPENDIX B

In-service Evaluation Results

Site One

Three staff attended the first in-service session and only the teacher attended the second session. The two additional staff attended at the request of the building administrator who thought they would benefit from the topics covered in the first session. Note that many of the questions asked the evaluator to consider the "usefulness" of a particular topic. Evaluation results were averaged per question and reported below.

Session I

Questions 1-3: 6.3

Questions 4-10: 6.7

Comments: Gave some good ideas for implementing ideas/systems

Session II

Questions 1-14 7.0

Site Two

Four staff attended the first and second in-service at Site One. Only two attended the third session. Note that many of the questions asked the evaluator to consider the "usefulness" of a particular topic. Evaluation responses were averaged and reported below for each question. Questions 4-8 were shifted into the next evaluation because this site chose to do a three part in-service. This request was made on the afternoon of the first in-service.

Session 1

Question 1: 6.5

Question 2: 5.0

Question 3: 5.2

Question 9: 7.0

Question 10: 7.0

Session 2

Question 1: 7.0

Question 2: 6.2

Question 3: 6.2

Question 4: 6.0

Question 5: Activity omitted due to time constraints

Question 6: 6.0

Question 7: 6.0

Question 8: 5.0

Question 9: 7.0

Question 10: 6.5

Session 3

Question 1: 5.5

Question 2: 7.0

Question 3: 6.0

Question 4: 6.0

Question 5: 6.0

Question 6: 5.0

Question 7: 7.0

Question 8: 5.5

Question 9: 6.0

Question 10: 6.0

Question 11: 5.5

Question 12: 5.5

Question 13: 6.0

Comments:
I have learned a lot through our discussions, the videos, and hand-outs. I need to go through the entire program again, myself, so I can organize it into meaningful pieces that I can use to help my specific student. It would have been helpful for our staff to have time with you to process the given information and apply to Calvin.

Excellent! I have learned so much. I see a variety of ways I can apply this knowledge with other students as well. Thank you!!

APPENDIX C

APPROVAL FROM UNIVERSITY COMMITTEE ON RESEARCH INVOLVING HUMAN SUBJECTS

MICHIGAN STATE
UNIVERSITY

March 24, 1997

TO: David A. Stewart
343 EH

RE: IRB#: 97-081
TITLE: COMMUNICATION INTERVENTION FOR CHILDREN WHO ARE DEAFBLIND: THE INFLUENCE OF AN INSERVICE WITH FOLLOW-UP APPROACH ON TEACHER COGNITION AND PRACTICE
REVISION REQUESTED: N/A
CATEGORY: 1-A,C,D
APPROVAL DATE: 03/22/97

The University Committee on Research Involving Human Subjects'(UCRIHS) review of this project is complete. I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and methods to obtain informed consent are appropriate. Therefore, the UCRIHS approved this project and any revisions listed above.

RENEWAL: UCRIHS approval is valid for one calendar year, beginning with the approval date shown above. Investigators planning to continue a project beyond one year must use the green renewal form (enclosed with the original approval letter or when a project is renewed) to seek updated certification. There is a maximum of four such expedited renewals possible. Investigators wishing to continue a project beyond that time need to submit it again for complete review.

REVISIONS: UCRIHS must review any changes in procedures involving human subjects, prior to initiation of the change. If this is done at the time of renewal, please use the green renewal form. To revise an approved protocol at any other time during the year, send your written request to the UCRIHS Chair, requesting revised approval and referencing the project's IRB # and title. Include in your request a description of the change and any revised instruments, consent forms or advertisements that are applicable.

PROBLEMS/ CHANGES: Should either of the following arise during the course of the work, investigators must notify UCRIHS promptly: (1) problems (unexpected side effects, complaints, etc.) involving human subjects or (2) changes in the research environment or new information indicating greater risk to the human subjects than existed when the protocol was previously reviewed and approved.

If we can be of any future help, please do not hesitate to contact us at (517)355-2180 or FAX (517)432-1171.

Sincerely,

David E. Wright, Ph.D.
UCRIHS Chair

DEW:bed

cc: Susan B. Marks

OFFICE OF
RESEARCH AND GRADUATE STUDIES

University Committee on Research Involving Human Subjects (UCRIHS)

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