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AUGMENTATIVE AND ALTERNATIVE COMMUNICATION SYSTEMS FOR STUDENTS
WITH DISABILITIES: A CASE STUDY OF FOUR STUDENTS AND THEIR
COMMUNICATION TEAM

By

ANGELA PALAZINI

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE
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OF

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2019

ABSTRACT

A qualitative methodology was used to investigate the perceptions of four students and their communication team members regarding many facets of augmentative and alternative communication systems. A multiple case study design with cases across three academic levels within a public school district was implemented. Information was gathered through semi-structured interviews, document review, and observations. Four themes emerged from the data: “They told us about it” (Laurette), “Give our kids relationships” (Elizabeth), team approach, and working with AAC. Participants described their experience in regards to decision-making, ideal function, training, usage, maintenance, benefits, and challenges. Participants expressed a lack of choice when deciding on an AAC system. The communication team emphasized the lack of training to use an AAC system and the alternatives they seek to become proficient. Participants highlighted the benefits and challenges of using and working with an AAC system. The lack of data collection was also discussed when determining the effectiveness of an AAC system for a student. Results are discussed with implications and directions for future research.

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LIST OF ABBREVIATIONS

CCN- Complex Communication Needs

AAC- Augmentative and Alternative Communication

IEP- Individualized Education Program

IDEA- Individuals with Disabilities Education Act

IDEIA- Individuals with Disabilities Education Improvement Act

AT- Assistive Technology

SLP- Speech Language Pathologist

ISAAC- International Society for Augmentative and Alternative Communication

ASHA- American Speech-Language-Hearing Association

EHA- Education for All Handicapped Children Act

ATAP- Assistive Technology Access Partnership

NJC- National Joint Committee for the Communication Needs of Persons with Severe
Disabilities

FAPE- Free Appropriate Public Education

CHAPTER 1

INTRODUCTION

The Importance of Communication for Individuals with Complex Communication Needs

In the United States, approximately 1.3% of all people cannot rely on their natural speech, as a form of communication, to meet their daily needs (Beukelman & Mirenda, 2013). The lack of ability to communicate effectively, by any mode, impacts all phases of an individual's life. Effective communication offers an individual the opportunity to express needs, make comments, give opinions, protest, etc. The ability to effectively communicate is essential for learning and development, personal care, social engagement, education, employment, and medical care (Beukelman & Mirenda, 2013; Glennen & DeCoste, 1997). When an individual is an effective communicator, she is able to affect her life in meaningful ways.

Individuals use a variety of ways to communicate: spoken word, writing or typing a message, facial expressions, and hand gestures such as sign language, etc. Individuals with disabilities who have complex communication needs (CCN) may use a combination of modes to communicate such as gestures and verbal utterances, eye gaze and picture symbols. Individuals may have different modes of communication depending on where they are; they may communicate through gestures and short utterances at home while using picture symbols and a communication device in school. Some students use multiple modes of communication such as speech, gestures, and pictures while others prefer a single mode such as a speech generating device.

Communication is the essence of basic human rights (Chung & Stoner, 2016; Dressler, Bland & Baumgartner, 2016; Hourcade, Pilotte, West & Parette, 2004; Lloyd, Fuller & Arvidson, 1997; Scherer, 2000; Williams, Krezman & McNaughton, 2008). As someone who relies on augmentative and alternative communication (AAC), Bob Williams (2000) discusses how his reliance on an AAC system allows him to foster social relationships and connect with those around him on a personal level. Williams talks about the give and take of communication within life and how he does not feel he would have been able to convince his teachers he was capable without his first typewriter. Many individuals with CCN are able to communicate with their immediate families, such as siblings and parents. Williams (2000) conveys how those who helped him to communicate the most were his family. Parents and siblings develop a way of communicating with their immediate family members within the home. The use of an AAC system also allows an individual to develop social relationships outside of their immediate family circle (Beukelman & Mirenda, 2013; Chung & Douglas, 2014), which allows an individual to expand their world beyond their home environment. This in turn allows a person to have a sense of belonging and inclusion into their community.

Some individuals with CCN require more assistance to be able to communicate effectively, and many students who have disabilities and CCN use some form of AAC systems. When a student is successful with her AAC system, she becomes a more competent communicator (Bailey, Stoner, Parette, & Angel, 2006b). Not all individuals with disabilities who have CCN are effective communicators when they leave school, and this can limit their ability to be a meaningful part of a democratic

society (Dewey, 2012). Being a functional part of society can have a positive impact on a person's quality of life.

A competent communicator is understood by a larger audience. The individual will be able to communicate with individuals she encounters within the school, home, and community settings about a variety of topics. The individual with effective communication will be able to express emotions which will reveal her personality to the world through the use of her AAC system (Angelo, 2000). This will allow individuals to create and keep relationships at a deeper and more meaningful level.

The improvement of technology in today's society has changed the way people work, learn, and communicate (Li, Worch, Zhou, & Aguiton, 2015). Students are bringing devices such as cell phones, iPads, and Chromebooks to school to use for a variety of reasons such as Kahoot assessments, completing research, using the calculator and calendar features as well as for typing out assignments. A device can be an aid to a student but in some cases, the device is much more than that; it is the access point to a student's education. Some students who have a physical or cognitive impairment may need the assistance of a device to complete assignments, such as the use of a computer to read various text or enlarge the print so it is easier to read. In some cases, these devices are considered assistive technology (AT). Assistive technology is defined as "...any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of a child with a disability" [20 U.S.C. §1401(1); 1401 (2)]. The Individuals with Disabilities Education Improvement Act (IDEIA; 2004) requires that assistive technology be considered for all students with an

Individualized Education Program (IEP). One component of assistive technology that needs to be considered especially for those individuals with CCN is some form of AAC.

Recognition of the Problem

According to the National Joint Committee (NJC) for the Communication Needs of Persons with Severe Disabilities, all individuals with disabilities have the right to use communication to make a difference regarding the condition of their existence (Brady, et al., 2016). Individuals who are unable to communicate effectively face severe restrictions on all aspects of their life without access to speech (Beukelman & Mirenda, 2013). AAC systems are typically purchased to enhance effective communication skills for students with disabilities who have CCN, however; they are often abandoned or not used to their full potential (Stoner, Angell, & Bailey, 2010). The individuals involved with helping students manage and use their AAC system may approach the device from different viewpoints. Many students who use AAC systems are dependent on those adults around them such as teachers, speech-language pathologists, and parents to foster the use of these systems. When individuals enter the adult world there are many decisions an individual needs to make. One section in an IEP for a student fourteen years or older helps a student to plan for transition into adulthood. This transition IEP asks a student to describe their goals one year after high school in the area of post-secondary education, employment, and independent living. AAC systems which are not used to their maximum potential can interfere with a student's success during their academic career as well as post-secondary programs, in the workforce and in the community (Bryen, Potts, & Carey,

2007; Hamm & Mirenda, 2006; McNaughton & Bryen, 2007). The determination of an AAC user's success in a post-secondary program tends to begin with high school experiences (McNaughton & Bryen, 2007). As a result, some AAC users have difficulty obtaining employment in adulthood. Barriers such as poor work preparation, few opportunities to find a job, and physical, and environmental barriers interfere with an AAC user finding employment (Bryen et al., 2007). Successful inclusion into society is intertwined with the ongoing development of communication skills by individuals who use AAC (McNaughton & Bryen, 2007). When the viewpoints of those individuals who assist a student to use their AAC system differ the level of use and the purpose of the communication can vary.

Statement of the Purpose

Examining those individuals who have direct experience with AAC systems will provide the information needed to improve AAC instruction, so all individuals with disabilities and CCN leave school as effective communicators. Under federal law, students with disabilities are entitled to special education and related services until the end of the school year of their 21st birthday [20 U.S.C. § 1414 (1)]. Students should have the expectation of being an effective communicator when they leave school at the age of 21. Including the students within this study will provide direct insight into their experiences when communicating with those around them. Understanding their experiences about what they like and/or dislike about their AAC system as well as benefits and/or challenges will assist those around them to better ensure they leave school as effective communicators. Where possible, policies should be put in place to ensure that all students are effective and competent communicators

when they leave the school system. This research can help aid in the creation of those policies.

The purpose of this study is to examine the perspectives of the various members of the communication team as it relates to a particular AAC system being used by students with disabilities and CCN. A qualitative approach to this problem is being proposed because it “is a systematic approach to understanding qualities or essential nature of a phenomenon within a particular context” (Brantlinger, Jimenez, Klingner, Pugach & Richardson, 2005, p. 195). The use of AAC systems is not a common way to communicate with a person, hence it is the phenomenon within the context of communication. Due to the fact that the IDEIA addresses the use of AAC, it is important to resolve issues, such as abandonment, surrounding AAC systems. It is also important to understand the ideal use of AAC in everyday life. When the perspectives of parents, educators, and students is examined collectively, it can offer insights into educational practices which can assist professionals to recognize the support and activities necessary for positive student outcomes (Chung & Stoner, 2016). Data collected from a document review, observations, and interviews regarding the communication teams’ perspectives will allow for professional development to be designed as well as policy related the AAC training and instruction.

Definitions of Important Terms and Concepts

Augmentative and Alternative Communication system (AAC): defined for this research as some sort of device or tool either low tech or high tech used by an individual to communicate with others (ASHA, 2017).

- Low-tech AAC systems include systems that are not electronic (Bailey, Parette Jr., Stoner, Angell, & Carroll, 2006a; Bailey, et al., 2006b; Johnson, Inglebret, Jones, & Ray, 2006) such as Eye-Com Boards, Picture Exchange Communication Systems (PECS), or Pragmatic Organisation Dynamic Display (PODD) systems.
- High-tech AAC systems are electronic or computerized systems (Bailey et al., 2006b; Johnson et al., 2006) such as an iPad, Tobii Dynavox, and screen readers. These devices use a variety of programs and apps. These systems typically require a great deal of programming so students have access to necessary vocabulary (Bailey et al., 2006b).

Effective communication: For the purposes of this study, effective communication is when the intent and meaning of one individual is understood by another person (International Society for Augmentative and Alternative Communication, 2018).

Individualized Education Program (IEP) team: For the purpose of this study, the IEP team includes parent(s)/guardian(s), special education teacher, regular education teacher, and the student when they are fourteen and older. The IEP team can also include other personnel such as an occupational therapist, physical therapist, speech-language pathologist (SLP), vision specialist, hearing specialist, orientation and mobility therapist, adaptive physical education teacher, etc.

Communication team: For the purposes of this study, the communication team includes parent(s)/guardian(s), student, special education teacher, and speech-language pathologist.

CHAPTER 2

REVIEW OF THE LITERATURE

History of AAC

In The Beginning

Alternative communication has been around for centuries. The use of manual sign language has been used in Europe as early as the sixteenth century and Native Americans used a system of gestures to communicate between tribes (Glennen & DeCoste, 1997; Woodward, 1978). American Sign Language was developed from these earlier manual languages and continues to be used today (Woodward, 1978). American Sign Language was developed to support individuals with hearing loss. Unaided AAC does not require any external supporting devices; communication can occur through the use of gestures, facial expressions, or sign language (Andzik, Schaefer, Nichols, & Chung, 2017; ASHA, 2017; Hourcade et al., 2004; Wilkinson & Hennig, 2007). The use of American Sign Language is considered an unaided form of AAC.

The 1950s saw the beginning of AAC as we understand it today. The use of AAC was first used with individuals with severe disabilities (Glennen & DeCoste, 1997; Hourcade et al., 2004). The use of communication boards such as alphabet boards was used in the early years of AAC. Alphabet boards, for example, are placed many times on a clear picture frame style board with the letters of the alphabet around the board on both sides. A communication partner holds the alphabet board up in front of an individual who utilizes the board to communicate. The letters are mirrored on each side of the board so the communication partner can follow along with the

message the individual is communicating. The individual looks at the letter(s) needed to spell out a message. Communication boards require less fine motor skills than some high tech systems and are easy to make which make them a quick communication tool.

1960s and 1970s

In the 1960s the first piece of communication technology was developed for individuals with severe physical disabilities. This technology, called POSSUM (Glennen & DeCoste, 1997), was a switch-controlled typewriter. The POSSUM was a large and bulky communication system that did not have speech output technology. There were no speech generating devices (SGD) or portable computers in the 1960s. There were few choices when AAC technologies were first being developed and individuals were constrained by the technologies available at the time (Williams et al., 2008). Many of the communication systems relied on the alphabet (Hourcade et al., 2004). Communication systems which rely on the alphabet mean the individual needs to have some literacy skills in order for this type of system to be useful. Literacy skills are needed by both the individual using this type of system and their communication partner for this system to be successful. Literacy skills are needed to receive and send messages. The alphabet boards that were used were not considered to be a method of communication but an educational tool (Glennen & DeCoste, 1997). Individuals who lacked literacy skills at this time were left without an effective way to communicate. Due to new laws during the 1970s (e.g. EHA), students with multiple disabilities began to be educated in the public schools (Glennen & DeCoste, 1997;

Hourcade et al., 2004). Individuals with disabilities were becoming a more prominent part of the educational community, and the use of AAC was becoming more accepted.

1980s and 1990s

In the 1980s AAC emerged as a professional specialization for SLPs and educators (Glennen & DeCoste, 1997). Conferences and specialized groups such as the International Society for Augmentative and Alternative Communication (ISAAC) began during this time. The focus of this group was to promote the best possible communication for individuals with CCN (ISAAC, 2018). As more legislation was passed in the 1980s (e.g. Tech Act), AAC became a more significant part of a student's educational experience. Photographs and line drawings began to be used as part of communication boards beginning in the 1980s (Ogletree & Harn, 2001).

The 1990s saw the beginning of voice output communication systems as well as software programs related to communication (Ogletree & Harn, 2001; Shane, Blackstone, Vanderheiden, Williams & DeRuyter, 2012). The types of systems that were available to individuals with CCN became smaller and lighter during this time. In 1997 updated IDEA legislation made more provisions for AAC to be considered for each student with an IEP under the assistive technology umbrella [20 U.S.C. § 1414 (3)]. A link can be seen between new provisions around AAC services, and more students with disabilities being included in the regular education setting (Hourcade et al., 2004).

2000-Present

Mobile technology has impacted the lives of individuals with and without disabilities (McNaughton & Light, 2013). The development of apps for mobile

technology devices and SGDs offer greater possibilities and more connections than ever before (Light & McNaughton, 2013). Communication systems in current times are lighter and more portable than in years past. The introduction of iPads and other hand held devices has allowed AAC systems to become more affordable and accessible (McNaughton & Light, 2013). The relatively low cost of these devices provides more access for families, school districts and agencies to be able to purchase these systems. The variations of apps related to communication that can be put onto a mobile device has allowed for students with CCN to blend in with their peers who also use mobile devices (McNaughton & Light, 2013).

Acceptance of individuals who use AAC systems has improved with enhanced technologies (Light & McNaughton, 2013; McNaughton & Light, 2013). In today's society, many people walk around with a smartphone or iPad. The amplified use of these devices has allowed for increased social acceptance of the use of AAC. The changes and increased adoption of AAC are due in part to the iPad revolution (McNaughton & Light, 2013).

The use of mobile technologies has allowed individuals to enhance their communicative competence allowing them to attain higher education, employment and quality of life (Light & McNaughton, 2013; Dressler et al., 2016). McNaughton and Light (2013) encourage professionals to keep in mind that the focus is communication and not technology. The use of technology is not the end goal; the end goal is effective communication.

Laws and Policies

Education for All Handicapped Children Act

The acceptance of AAC as a form of communication began due to the legislation passed in 1975 regarding the mandate of a free and appropriate public education for all students. The Education for All Handicapped Children Act (EHA) (P.L. 94-142) was a milestone in the education of students with disabilities (Beukelman & Mirenda, 2013). Public schools were then mandated to educate students with disabilities and provide them with special education and related services in their least restrictive environment (Hourcade et al., 2004). P.L. 94-142 was based upon four main principles; all students with disabilities are provided with a free and appropriate public education; to ensure protection of the rights of students with disabilities and their parents; assist states and local school districts with the ability to provide students with disabilities an education; and to assess and assure the effectiveness of the programs which educated individuals with disabilities (Department of Education, 2010). The Rehabilitation Act of 1973 also protected students with disabilities as this law protected any individual with a disability from being discriminated against within any program that receives federal funding (Glennen & DeCoste, 1997). These laws helped to establish a more inclusive environment within the school by first allowing students with disabilities the right to be educated and then by ensuring any program that receives federal dollars also include opportunities for students with disabilities. Assisting students with CCN to become effective communicators is part of providing them with a free and appropriate public

education. Students need to be able to effectively convey their academic knowledge in order to participate in assessing if a program is effective.

The EHA (P.L. 94-142) has been amended and revised several times. Some significant amendments occurred in 1983 (P.L. 98-199) and 1986 (P.L. 99-457). The amendments in 1986 required that all states provide all children with disabilities special programs and services from birth (Department of Education, 2010). In 1990, the amendments to the EHA (P.L. 101-476) also changed its name to the Individuals with Disabilities Education Act (IDEA). These changes included more transition services from high school to adult living for students with disabilities (Department of Education, 2010). Amendments that took place in 1997 (P.L. 105-17) mandated all students with disabilities be provided access to assistive technology devices which includes AAC (Chung & Stoner, 2016). IDEA was most recently reauthorized in 2004 (P.L. 108-446) and preserved the structure and civil rights that had been guaranteed but also made significant changes. Many of the changes were related to paperwork, transition, English-Language services, and IEP evaluations (Johnson, 2005). Changes to the requirements related to assistive technology were small but significant. IEP teams previously needed to consider if a child required assistive technology; this changed to a more liberal approach of considering if a child needed assistive technology (Mittler, 2007). This change in terminology within the law provides greater access to assistive technology, including AAC systems, for more students.

The Technology-Related Assistance Act

The Technology-Related Assistance Act (Tech Act) of 1988 (P.L. 100-407) was created to establish a grant program for states to be able to provide technology-

related assistance to individuals with disabilities [29 U.S.C. § 2201]. As with EHA, the Tech Act has been amended, the first time was in 1994. This amendment sought to increase access to assistive technology through policy changes, regulations, and practices (ATAP, 2016). In 1998 the Tech Act was reauthorized as the Assistive Technology Act (AT), which focused more on support services. President Bush reauthorized the AT Act again in 2004, providing legislation for individuals with disabilities of all ages who could “reap the benefits of the technological revolution and participate fully in life in their communities” [29 U.S.C. § 1707 (2)]. In 2014 the U.S. Government moved administration of the AT Act to the Department of Health and Human Services (ATAP, 2016).

Efforts to create national guidelines for developing and implementing educational programs that meet the needs of students with significant communication needs began in 1984. A national symposium supported by the U.S. Department of Education's Office of Special Education Programs (OSEP) took place in August 1985 to assist with the creation of these guidelines (ASHA, 2018). As a result, in 1986, two major groups working to better the lives of individuals with disabilities, the American Speech-Language-Hearing Association (ASHA) and The Association for Persons with Severe Handicaps (TASH), created an interdisciplinary group which focused on communication. As a result, the National Joint Committee for Communication Needs of Persons with Severe Disabilities (NJC) was created and were tasked with advocating for individuals with significant communication support needs. The NJC created a Communication Bill of Rights in 1992. This Communication Bill of Rights was designed to bring attention to the fact that all individuals with a disability have the

fundamental right to influence their lives through communication (Brady et al., 2016). There are fifteen rights included to ensure an individual can participate fully in communication interactions. These rights include things such as the right to have access to functioning AAC systems; the right to be addressed directly and not be spoken for; the right to be treated with dignity, courtesy, and respect.

Communicative Competence

Newborns are not able to effectively communicate their wants and needs. Providing newborns with an AAC system will not alleviate this issue. For individuals with CCN, providing them with an AAC system does not mean they will automatically become competent communicators (Beukelman & Mirenda, 2013). The American Speech-Language-Hearing Association (ASHA) defines communicative competence as an individual's ability to freely express ideas, thoughts, and feelings to a variety of listeners across contexts (2017). There are four components to communicative competence; operational, linguistic, social, and strategic competence.

Operational competence. Operational competence relates to the ability to operate the AAC. When an individual uses an unaided AAC the operational competence is the skills needed in order to generate the hand or body positions to create the movements or gestures (Light & McNaughton, 2014). When using aided AAC systems, the operational competence relates to the maintenance and the instruction in all operational aspects of the system (Beukelman & Mirenda, 2013). Operational competence is typically achieved by those who support the individual who uses an aided AAC system (Beukelman & Mirenda, 2013; Light & McNaughton, 2014; McNaughton, Rackensperger, Bender-Wood, Krezman, Williams, & Light,

2008). Operational competence for aided AAC systems involves maintaining the system from damage, keeping vocabulary up to date, making repairs, and making overlays/displays (Beukelman & Mirenda, 2013).

Social competence. Social competence is based around how to have a conversation. An individual needs to learn how to appropriately engage in a conversation by gaining someone's attention (Light & McNaughton, 2014). AAC users also need to learn how to ask questions of others to demonstrate that they are interested in what the other person is talking about (McNaughton et al., 2008). Parents stress that the most critical skill to teach their children is how to ask questions of others in a conversation (McNaughton et al., 2008). Social competence is gained from using communication in a number of situations with a variety of use. According to Lloyd, Fuller, and Arvidson (1997), social competence might be the most difficult to learn because individuals who are learning to use an AAC system have not experienced successful communication interactions. Successful communication interactions include maintaining a topic of conversation, gaining someone's attention before speaking, or maintaining the interest of a communication partner.

Linguistic competence. Linguistic competence refers to an individual's knowledge of their family's native language and that of their community (ASHA, 2017; Beukelman & Mirenda, 2013; Lloyd et al., 1997). Individuals who use AAC also must learn the code and symbols from the AAC system (Light & McNaughton, 2014). There is a significant amount of language that students need to learn to become an effective and competent communicator when utilizing an AAC system. Students need to not only learn the language of their home and community but also the symbols

themselves, the referential, and syntactic aspects to convey meaning (Light, 1989). This means students must be able to relate to the symbols being used within their AAC system as well as how to put a message together using these symbols to convey meaning. Students need to incorporate the language of their family, community and AAC systems in order to communicate with those around them.

Strategic competence. AAC is not a perfect replacement for spoken language. There are difficulties and barriers for individuals when using AAC to communicate. Strategic competence is the coping strategies that individuals who use AAC systems to communicate must learn in order to solve communication breakdowns (Beukelman & Mirenda, 2013; Light & McNaughton, 2014; Lloyd et al., 1997; McNaughton et al., 2008). A breakdown in communication may occur particularly when an individual who uses AAC is communicating with someone who is unfamiliar with AAC. Some coping strategies that can be used by an individual to correct when there is a communication breakdown would be, repeating the message, providing additional information, and providing listeners with a message about the AAC system (Beukelman & Mirenda, 2013; Light & McNaughton, 2014; Lloyd et al., 1997; McNaughton et al., 2008).

Perceptions of Speech and Language Pathologists and Special Educators

The school environment is often the largest community experienced by students on a daily basis. The school environment is where students learn to build relationships outside of the home and relate to others (Soto, Müller, Hunt, & Goetz, 2001). The ability to communicate effectively is a crucial component to the success of building relationships outside of the home. The decision-making team that assists a

student to effectively communicate in the school environment and other environments includes the parent, special educator, and many times a Speech-Language Pathologist (SLP). The manner in which these team members approach the topic of AAC use can be very different.

The ideals and perceptions of AAC systems has a direct impact on how well and how often a student will utilize their system. A study by Johnson et al. (2006) found that 90% of SLPs agreed AAC was successful when the user and communication partners valued it as a means to communicate. In contrast, research shows 33% of AAC devices are abandoned for various reasons (ASHA, 2017; Johnson et al., 2006; Scherer, 2000). A student needs to accept the system as a functional way to communicate with unfamiliar listeners. Peers and adults who interact with a student who uses an AAC system also need to see the value and benefit of the student using this system to communicate. According to Bailey et al. (2006b), special educators and SLPs reported that they felt that parents were uncomfortable with the technology; therefore they were unwilling to use the AAC systems within their homes. Some parents may not understand how to use the system or are afraid it will be broken while at their home and then they will be financially responsible for replacing the AAC system. The differences between communication expectations in home and school also have an impact on how a student uses their system. Some special educators and SLPs also felt that parents do not realize the potential the AAC system affords their child to communicate more effectively (Bailey et al., 2006b).

The perceptions of SLPs and special education teachers are important to understand because they can explain how often and for what purposes a student will

be using an AAC system. For example, if the SLP and special education teachers only see the value of the AAC system to make requests, for example, then the students miss out on other social opportunities when they can use their AAC systems to interact with peers. If SLPs and special educators feel the primary purpose of an AAC system is for social interactions, then students may not use these systems to the full extent to help them access the curriculum. In a study completed by Bailey et al. (2006b), one of the teachers interviewed stated, “Ultimately, it’s not going to matter if that kid knows the number five, especially at the level I’m teaching at (high school), but if I can teach that kid to make a request, to go to someone and request something, or to make a comment to someone...that’s going to have a much more life-altering effect than identifying the number five” (p. 149). When the purpose of the AAC system is not clearly defined by the IEP team, the members of the team can have limiting philosophies about the way the AAC system should be implemented. It is vital that all team members discuss and ultimately come to an agreement on how to best utilize the AAC system with the student.

Perceptions of Families

Most families want their children to be as independent as possible as well as a functioning member of society (Bailey et al., 2006a). Without an AAC system, it is extremely difficult for a student with complex communication needs to achieve these goals (Bailey et al., 2006a; McNaughton et al., 2008). Angelo (2000), stated that it is important to know the roles of the parents related to AAC to support sustained family involvement over time. Parents should feel their voices are valued, and respected throughout this endeavor. Parents should be an integral part of the planning in their

child's IEP as they are experts on their children and should be valued (Moore, 1993). Understanding the perceptions and beliefs of the parents as it relates to the need for an AAC system is a critical feature in choosing an AAC system. Some families allow the schools to make all the decisions when choosing the appropriate AAC system while others are part of the process (Bailey et al., 2006a). This is particularly true with some families who come from culturally and linguistically diverse backgrounds who allow the school to make the decisions regarding AAC for their child.

Ultimately the use of AAC systems happens more in the home and community settings than in the school environment due to the fact that students spend more time at home than in school; therefore a partnership needs to be formed between school and home. The school environment provides a base for learning an AAC system to prepare students as effective communicators into adulthood. Families gradually assume the responsibilities of programming, maintaining, and implementing the AAC systems as their child ages out of school (Mandak, O'Neill, Light, & Fosco, 2017). Families need to be part of the decision-making process as well as the learning process in order to maximize the use of the AAC system (Hourcade, Parette, & Huer, 1997).

Some families see the importance socially and educationally for their child to use an AAC system (Angelo, 2000; Stephenson & Dowrick, 2005), however, there can be barriers to its use. Some of the barriers to the use of AAC systems within the home include inconsistent reliability of the systems (Bailey et al., 2006a). Some of the reliability issues include having difficulty programming needed vocabulary and knowing where to go when the system breaks to have it repaired. Some families are not as accepting of the AAC system as a mode of communication. Culturally and

linguistically diverse families feel relevant vocabulary and family-valued implementation opportunities need to be identified in order to increase communicative success (Mindel & John, 2018). Some families did not acknowledge the process to use an AAC system as talking (McCord & Soto, 2004) which would impact the level of AAC use within the home environment. Therefore, families need to be a part of the decision-making process when it comes to choosing an appropriate AAC system for their child.

Context for Social Model of Disability and Ecological Systems Theory

Effective communications skills do not come easily for every individual. Most students who have intellectual disabilities and CCN require direct instruction to improve their communication skills. In some cases, a student may require the use of an AAC system. Initial instruction or training in the use of this system typically happens in the school setting. According to Paulo Freire (2014) when a student is unable to communicate, there can be no true education. Education happens within the walls of a school but also within the home and community. By sharing beliefs, knowledge, and opinions, individuals can learn from those around them. The process of living together has educative value (Dewey, 2012). If an individual is unable to participate in these experiences, they are being denied access to society. “Schools must be able to support the widest diversity of intellectual and practical development for all students so they might prepare themselves for the many possible life activities” (Danforth, 2008, p.50). Education provides the opportunity to convey the shared experiences which allows a person access to democracy. When a student does not have an AAC system, due to any number of reasons, the student is being denied a

basic human right. Without a way to communicate effectively, an individual is unable to be a full member of their school and community (Beukelman & Mirenda, 2013). Some of these human rights are outlined in the aforementioned Communication Bill of Rights developed by the NJC. By having the ability to converse about the world, people are able to transform it, which in itself is a way to achieve significance as a human being (Freire, 2014).

This study is framed using the social model of disability and ecological systems theory. The inclusion of students with disabilities within the general education classroom and community is the ultimate goal for all students (Kent-Walsh & Light, 2003). The main idea of the social model of disability is that a disability is socially created (Connor, Gabel, Gallagher & Morton, 2008) this means that disability is not viewed as something inherent to a person, rather it is created through multifaceted interaction between the person and the larger world (Ashby, 2012). The social model of disability views the issue of disability to be within society and not within the individual. In schools, this includes the perspectives of teachers and the interaction with and between students. Disability in schools emerges through the interaction of the student with the opportunities of the classroom, teacher perspectives, and practices (Ashby, 2012). How teachers perceive students with disabilities has an impact on the opportunities they are provided within the classroom setting. Students with CCN need to be provided with multiple experiences, instruction, and opportunities to help prepare them to be an effective communicator.

Classrooms and schools should provide access for all students to be educated in the same environment [20 U.S.C. § 1412 (5)]. This inclusive environment should

include various types of instruction, modified materials as well as a modified environment which may include such things as adapted furniture, augmented storage space, rugs, and audio equipment if necessary. Dewey (2012) put forth the notion that it is the job of the school to create a balanced environment to ensure every individual has the opportunity to experience a broader environment.

Ecological Systems Theory combines all environments, and people when focusing on human development. Bronfenbrenner (1994) includes four levels within his theory, each nestled within the other; microsystem, mesosystem, exosystem, and macrosystem. These systems will be more fully explored in the next section. Individuals are lifelong learners, therefore, it is important to examine all environments and people within individuals' lives. An essential skill for all individuals to learn is to be an effective communicator. For those individuals with CCN, each person and setting has an impact on their development.

Social Model of Disability

The first theoretical framework for this study is the social model approach to disability (Danforth, 2008). Within this model, a person with a disability is not considered to have a deficit in functioning. "It consists of the variety of social interpretations of human differences that construct disability by assigning to it particular linguistic, interpersonal, and political meanings, often limiting the access, status, and participation of disabled persons" (Danforth, 2008, p. 46). This theory seeks to shape schools and classrooms into democratic communities, interactive spaces where diverse individualities are respected and valued (Danforth, 2008).

The social model approach is applicable to the current study because the abandonment of a student's AAC system limits the user's voice in the classroom and thus limits the student's ability to participate within a democratic community. The abandonment of AAC systems is a potential loss of freedom, and independence (Kintsch & DePaula, 2002). Students rely on AAC systems to communicate their wants and needs and their academic knowledge to those around them. The adults around the student are typically responsible for the maintenance of the AAC system. This means the programming or modifying of vocabulary within the system depends on the adult's ability to complete this task. The adult's perception as to how the system should be used will influence the vocabulary programmed into the system. The perceptions of the individuals responsible for teaching the student to use an AAC system, as well as the individuals responsible for ensuring the student uses the AAC system effectively, can have an impact on the success of the student to use the system. Without the system, the students are limited in the number responses as well as the number of people who would be able to understand them. More familiar listeners would be able to understand the student, but someone who is new to the child such as a substitute teacher or a cafeteria worker would not be able to understand the student effectively.

The social model of disability also applies given the current technology that is used as AAC. The use of smartphone technology has allowed for more social acceptance of AAC systems (Light & McNaughton, 2014; McNaughton & Light, 2013). Because of the wide availability of portable devices, the use of communication apps is not as unusual as in years past (McNaughton & Light, 2013). With more

social acceptance of the use of technology individuals who use technology for an AAC system are less likely to be viewed as having a deficit. The increase in social awareness and acceptance of AAC has come to the increased adoption of AAC by individuals with CCN and their families (McNaughton & Light, 2013). With more social acceptance of the use of AAC systems, the more individuals can become a part of their community.

Ecological Systems Theory

The second theoretical framework for this study is Bronfenbrenner's Ecological Systems Theory (Bronfenbrenner, 1979). His theory was developed to define and understand human development through the ecological system of relationships that form the person's environment (Johnson, 2008). Bronfenbrenner's theory looks at people and settings within a person's life and examines the impact on development and is based on several environments that are nestled inside of each other (Bronfenbrenner, 1979). Each layer of environments includes various settings that can have an impact on the developing person. At the center of all of the environments is the developing human being.

The Ecological Systems Theory is applicable to this study because it examines the developing person, the environment, and the evolving interaction between the two (Bronfenbrenner, 1979). The environment from which the student, their families, and their educators come, has an impact on how the student develops. Linguistic competence relates to learning an individual's native language and that of the community. Linguistic competence ties into the microsystem and the mesosystem within Bronfenbrenner's Ecological Systems Theory. Social competence also ties into

all levels of the Ecological System Theory as individuals learn to have a conversation with those around them. For AAC to be successful, the influences within the student's environments including the people with whom they interact must be carefully considered for AAC to be successful (Lloyd et al., 1997). Individuals communicate in multiple environments with multiple communication partners; therefore, all influencing factors must be considered as well as how these environments and individuals impact the use of AAC. Examining the layers of Bronfenbrenner's Ecological Theory within this study will account for those influencing factors.

Microsystem. Bronfenbrenner (1979) describes the microsystem as a pattern of activities, roles, and interpersonal relations experienced by the developing person in a given setting with particular physical and materialistic characteristics. This is the level where the person has direct contact with those around the individual. Not only does the environment have an impact on the person but the person has an impact on the environment. When a person has an impairment, this would have an impact on the microsystem. How the environment reacts to the impairment is connected to the social model of disability studies. How will the environment accommodate the impairment? At this level, the environment would have more ability to make accommodations because the environment would be a place like a person's home.

A home environment is a place of comfort and familiarity for any individual. It is a place where a person should be able to communicate her thoughts and ideas freely. When a person has a CCN and requires an AAC system, the family will have an impact on the success of this system within this environment. When families support the use of AAC systems the individual will have more success (Chung &

Stoner, 2016). A person who uses an AAC system is more likely to use the system in the home when the family has been a part of the decision-making process and sees the benefits of the use of this system in multiple settings. In a study completed by Angelo (2000), 49.1% of parents studied reported they had a better relationship with their child because of the use of an AAC system. Angelo (2000) also found improved relationships with extended family when the individual with CCN utilized an AAC system. While some families are eager to incorporate AAC into the home environment, others are not as eager. This can be caused by the lack of participation by families in the decision-making process for the AAC system or due to lack of training in using the system (Angelo, 2000; Chung & Stoner, 2016). When families are not part of the decision-making process they do not have a connection to the system meaning they may not have an understanding about the benefits of the system and how it will benefit their child outside of school. Other families state they can understand their child without a communication system, therefore, they do not see the need for the AAC system in the home (Bailey et al., 2006b).

Mesosystem. Bronfenbrenner (1979) describes the relationship between two or more settings, in which the developing person actively participates as the mesosystem. At this level, the settings a child can be moving between would be school, home, and community (Bronfenbrenner, 1979). All of these settings have an impact on the development of a child. School professionals have an obligation to work with families and provide them with the information needed to make decisions for their child (Mandak et al., 2017). When a child has CCN schools need to include parents in the decision-making process for an AAC system. It is also important to

know how the professionals within the schools approach the use of AAC system (Mandak et al., 2017). It is important to know the perceptions of the teachers of a child who uses an AAC system since it is their responsibility to teach the child and those around them how to utilize this system with multiple communication partners in multiple settings.

Special educators and SLPs are typically the individuals who will be teaching the student to use the AAC system as well as provide multiple opportunities to use the device. One role of the SLP is to assist in incorporating an AAC system, but when their own experience is limited, this can be difficult (DeBortoli, Kelly, Mathinsen, & Balandin, 2014). Special educators must incorporate the AAC system into all opportunities throughout the day; formal lessons, informal lessons, non-structured learning activities, and play. When time is not provided to program the communication system correctly, this can make it difficult for the AAC system to be used within the classroom (Bailey et al., 2006b). Knowing how to program the AAC system will have a significant impact upon its use within the classroom and at home (Baxter, Enderby, Evans, & Judge, 2012). Programming the AAC system can include; adding vocabulary, changing the display screen, changing the voice, and creating new folders. When the vocabulary needed for the individual to communicate their message through the AAC system is not there, then the individual will be unable to communicate effectively (Baxter et al., 2012). This will, in turn, have an impact on how society views and treats this individual when they are unable to communicate effectively.

The community also has an impact on the use of an AAC system by whether or not the community accepts the AAC system as a mode of communication by an individual. The type of AAC system being used by a student can determine the level of acceptance by the community as something that is unfamiliar to many people may not be as easily accepted. In a study of families and AAC, “Parents reported the need to educate others about individuals who use AAC, to prepare their own children for negative reactions they might experience and to find ways to facilitate communication between their children and members of the public” (McNaughton et al., 2008). Engaging in conversation with a person who uses an AAC system is not typical; therefore the general public needs to be provided with the knowledge of how they can interact with someone who uses an AAC system. This again ties into the social model of disability studies. If the general public viewed the AAC system as an extension of the individual in assisting them with their inclusion within society, there would be no reason for parents to prepare or shield their children from any adverse reactions.

Exosystem. The exosystem is the next layer within the ecological systems theory. Bronfenbrenner (1979) defines this level as one or more settings where the individual does not participate, but events that happen within this setting have an impact on the developing individual. At this level decisions made by school committees or by the economic status of an individual’s family impact the developing individual. For example, decisions made by school committees in regards to school funding has an impact on the developing individual.

The decisions the federal and state governments make, related to laws and funding, have an impact on the developing individual. Parental involvement in the

development of a student's IEP is a part of the IDEA [20 U.S.C. § 1414]. Parents are a valuable resource about the student's background when developing the student's IEP. When a family is from a culturally and linguistically diverse (CLD) background, it requires more effort and planning on the side of the educator to ensure the participation of parents (Zhang & Bennett, 2003). This may mean arranging for an interpreter or preparing paperwork ahead of time for parents to review. Due to a lack of understanding of the IEP process many CLD families are unable to fully participate in the decision-making process (Jung, 2011).

Assistive technology devices and services are a requirement within IDEA for students ages 3 to 21 (Chung & Stoner, 2016). AAC systems fall under the category of assistive technology. There can be major discrepancies between districts with low and high-income families and the resources they are able to provide (Owens, Reardon & Jencks, 2016). These discrepancies can have an impact on the ability for districts to pay for AAC systems. Regardless of the level of funding, school departments have a legal obligation to ensure that these systems and the support services are provided to ensure the student is receiving a free and appropriate public education ([20 U.S.C. §1400(d)]; Day & Huefner, 2003; Judge, 2000). The costs that are associated with AT can be overwhelming. As a result, some districts may discourage the importance of AT systems within the classroom, which will lead to conflicts with families, educators, districts and the law (Day & Huefner, 2003). If districts favor AAC systems that are low technology devices because they are more cost effective they could be limiting a student's ability to grow beyond their limitations. When it comes to AAC devices, students should be provided with the most appropriate AAC system despite the cost.

Having the ability to communicate with family, peers, and neighbors is part of being in a democratic society. Individuals should have the ability to share experiences, provide information, and express their wants and needs to those around them. All individuals have the right to communicate in all settings with the people around them. “Equality, in this sense is a social achievement brought about through the central cooperation of individuals who remain ever mindful of issues of power and equity” (Danforth, 2001, p. 279). Given that a disproportionate number of poor and minority students are in special education (Castro-Villarreal & Nichols, 2016; Connor & Ferri, 2007), the inability for school districts to adequately fund AAC systems and the services that are needed to facilitate the use of the device, becomes an issue of equity. Dewey (2012) discussed the relationship between democracy and education stating:

It is the office of the school environment to balance the various elements in the social environment and to see to it that each individual gets an opportunity to escape from the limitations of the social group in which he was born, and to come into living contact with a broader environment. (p. 25)

This means as educators, we are to find a way for individuals with impairments, including those who have been oppressed by their social status, economic status, or ability status, to have access to more resources, so they are afforded the same opportunities as those students who are considered privileged.

Macrosystem. The final level of Bronfenbrenner’s ecological theory is the macrosystem. At this level, Bronfenbrenner (1979) discusses the consistencies which influence lower levels, such as culture and religion. A person’s cultural and religious

background structures the lifestyle the individual leads. These influences can have a bearing on decisions that are made in many areas of life including the use of AAC technology. When working with families of diverse cultures, it is important for professionals to understand family values, beliefs, traditions, expectations, experiences, and priorities (Parette & Angelo, 1996). Professionals should learn whether or not an AAC system will be accepted within the family culture and value structure to avoid abandonment of the AAC system.

Research Summary

The reviewed literature shows a need for a study which looks at all major participants regarding the many facets of AAC systems. Many studies examine only the SLPs or special educators, while other studies only examine the perspectives of the parents and families. Given the paucity of research with which all members of the communication team are examined, this study seeks to understand all members' perceptions about AAC systems. There is a lack of students' voices in previous studies and this researcher seeks to obtain the opinions the student who uses an AAC system, as well.

Research Questions

Interviews with students, parent(s), special educators, and speech-language pathologist were conducted to obtain relevant perspectives on the various facets of AAC systems. A group of semi-structured interview questions were created for each group. Observations, responses from interviews, and a review of documents were analyzed to answer the following research question.

RQ1: How do students with disabilities and their communication team describe the ideal function, training, usage, maintenance, benefits, and challenges of AAC systems across home, school, and community environments?

CHAPTER 3

METHODOLOGY

Introduction

This study sought to determine how students and their communication team perceive the many facets of AAC systems, to determine if they have varying perceptions regarding the ideal function, training, maintenance, benefits, and challenges of an AAC system. Examining these perceptions helped determine the impact on the level of use a student has with the AAC system. One component of this research determined the various perspectives of the stakeholders responsible for the maintenance (e.g. programming, repairs, charging, etc.) of a student's AAC system. These same stakeholders are also responsible for facilitating the use of the system. Special educators and SLPs are responsible for introducing an AAC system to the student, as well as providing multiple opportunities within the school setting to use the system. The use of AAC systems within the home is crucial to the success of the AAC system being carried over into the home and community. This research was a multiple case study and looked at several cases at the same time while looking for differences and/or similarities within and between cases.

Methodology

Case Study

A qualitative approach to this problem was proposed because it “is a systematic approach to understanding qualities or essential nature of a phenomenon within a particular context” (Brantlinger et al., 2005, p. 195). The use of AAC systems is not a common way to communicate with a person, hence it is the

phenomenon within the context of communication. Due to the fact that the Individuals with Disabilities Education Improvement Act (IDEIA) addresses the use of AAC, it is important to resolve issues, such as abandonment, surrounding AAC systems. If a student requires AAC to communicate effectively then the abandonment of the AAC system would be denying a student's ability to have a free and appropriate public education (FAPE) because they would have difficulty accessing the curriculum. It was also important to understand ideal AAC use in everyday life. All aspects of AAC are important to understand in order to make policy recommendations for its most effective use and maintenance.

Qualitative studies can “explore the nature and extent to which a practice has a constructive impact on individuals with disabilities, their families, or on settings where they tend to work, reside, or be educated” (Brantlinger et al., 2005, p. 196). The use of an AAC system allows a student to enhance participation in current and future integrated settings (Zangari & Kangas, 1997). Meaning the students are able to build relationships with peers, participate in general education classrooms, and participate in transition planning. The abandonment of an AAC system can have an impact on a student's ability to fully participate in the school community. The student is unable to communicate effectively with teachers or more importantly with social peers, nor able to participate in activities with typically functioning peers.

This collective case study included several cases that examined how students and their communication team described various facets of the AAC system. The use of multiple cases allowed for an examination within and between cases in multiple

settings. The evidence gathered within a collective case study is considered robust (Baxter & Jack, 2008).

Setting

This research was conducted in an urban area that provides education to 10,415 students within 23 schools serviced by 995 teachers. Fourteen percent of students in this school district received special education services. Thirty-seven percent of the students within this district qualified for free or reduced lunch, and this was below the statewide percentage of 48%. Five percent of the student population received ESL/bilingual services. The three major ethnic groups within this district were White, Hispanic, and Asian. Tables 1 (p. 40) and 2 (p. 41) provide a breakdown of demographics for the schools within this study.

Location of the Study: Case One

The first case in this research took place in a small neighborhood elementary school situated in the middle of a residential neighborhood. The school's motto promoted compassion, loyalty, ability, work ethic, and success among its students. This school's teachers educated 174 students. A majority of the school population (71%) identified as Caucasian. Thirteen percent of the student population identified as Hispanic. The remainder of the school population included African American (5%), Asian (2%), and Native American (1%). Eight percent of the school population identified with more than one ethnicity. This school employed 11 teachers to service these students. Nineteen percent of students within this school had an IEP and received special education services. Twenty-seven percent of students in this school qualified for the free or reduced lunch program.

The classroom where the one-hour observation for this case took place was a small square room which was initially designed as a small storage room when the school first opened. When entering this language-rich classroom, the wall to the right of the door had a colorfully decorated bulletin board. In front of this board was a counter which contained four desktop computers. There were four large windows within this classroom, two windows on two separate walls. The class included four small tables distributed around the classroom and six small student desks with chairs. Four of the desks were grouped to make a cooperative learning group while two other desks were arranged with one of the small tables. In the far right corner, there was an area rug with two-tier bookshelves in the same corner. In the center of the far wall was a U-shaped table where the teacher conducted educational groups. The teacher's desk was to the left of the U-shaped table. On one of the walls was a word-wall bulletin board and on another small bulletin board was a Social Emotional Learning plan.

Cases Two and Three

Cases two and three were completed at one of the four middle schools within this district. A school motto was not provided within the available school information. This was a large school with 763 students serviced by 76 educators. Sixteen percent of the school population received special education services. The school population was minimally diverse with seventy-six percent of the school identifying as Caucasian. This school's population also included students who identified as Hispanic (13%), Asian (6%) and African-American (2%). Two percent of the school population identified as multiracial. Twenty-two students received English Language

Learner (ELL) services, however, all have been exited from the program over the 2017-2018 school year. In this school, thirty percent of students qualified for free or reduced lunch.

The classroom setting for case two was in a small class environment. The class was conducted around one large table in the center of the classroom with several posters promoting a growth mindset on the walls. On one wall within the classroom were several windows which look into the classroom next door, however, these windows had been covered with paper. There was a whiteboard in the front of the classroom. The teacher desk was along one of the longer wall sections facing the wall.

The classroom setting for case three was within a larger classroom area that was created after the school was built to provide additional classroom space. The classroom setting was crowded with furniture. All the fluorescent lights were covered with blue light filters which dim the brightness in the classroom. There were two windows which have curtains and shades. There were three additional doors into the classroom other than the main classroom door. Two doors, one on either side of the room, provided access into each of the rooms on either side of this classroom and one door which leads outdoors. Seven student desks lined the three outer edges of the classroom. The front right corner contained a pop-up tent for a quiet area where bookshelves limited this quiet area space. Along the right side of the classroom was a large cabinet which was used as a coat closet and the teacher's desk and computer. In the center of the classroom were two rectangular tables together. On each of the short ends of the tables were student desks with a large magnetic whiteboard easel near the table.

Case Four

The fourth case was completed at one of the four high schools in this district. This high school had a population of 1,663 students serviced by 132 teachers. The high school promoted several values shared by students and faculty such as balance, order, leadership, tradition, spirit, perseverance, respect, integrity, diversity, and excellence. The high school's population was mostly Caucasian (56%). The population also included Hispanic (25%), African American (5%), Asian (9%), Native American (4%), and students who identified with multiple races (1%). Fifteen percent of students in this high school had an IEP, while fifty-seven percent of students qualified for free or reduced lunch.

The classroom setting, where the one-hour observation took place, was very informal for a classroom set-up. As you enter the room, it had a rectangular shape to it. A long counter on the right side was sectioned off into six sections with stools in front of each area where each section had supplies and decorations chosen by the students for their space. Hanging on this same wall was a Smart TV. In the back area of the room was a large rug. There were two round tables each with four chairs for students to work at and a larger rectangular table with eight chairs. On the left side of the room was another counter with a sink with another section of the counter that had a Keurig coffee maker. There was also a closet door along this wall. On the wall to the right of the entrance was a large whiteboard with the schedule of the day written on it.

Table 1

Student-Teacher Ratio and Qualifications

<i>Case</i>	<i># of Students</i>	<i># of Teachers</i>	<i>Free/Reduced Lunch</i>	<i>Students with IEPs</i>
1	174	11	27%	19%
2 & 3	763	76	30%	16%
4	1,663	132	57%	15%

Table 2

Families and Communities- Breakdown of students from various racial/ethnic backgrounds.

<i>Case</i>	<i>Caucasian</i>	<i>African American</i>	<i>Asian</i>	<i>Hispanic</i>	<i>Native American</i>	<i>Multiracial</i>
1	71%	5%	2%	13%	1%	8%
2 & 3	76%	2%	6%	13%		3%
4	56%	5%	9%	25%	4%	1%

Participants

Each participant in this study had been given a pseudonym to protect their anonymity. Tables 3 and 4 below provide a breakdown of information about each participant. The AAC coordinator, Elizabeth, is a SLP and the only participant that overlaps all cases. She was recruited via email after all the initial interviews were completed because she was mentioned by most parents, special educators, and SLPs as someone who provided training and information about the AAC systems being used. Elizabeth has been a SLP for twenty years and works with many students, educators,

and SLPs across the district. Because she was a part of each case, her perspective was critical to this research.

Table 3

Student Participant Information

<i>Case</i>	<i>Student</i>	<i>Academic Level</i>	<i>Qualifying Condition</i>	<i>AAC</i>
<i>1</i>	Amber	Elementary	Autism	Proloquo2Go
<i>2</i>	Gabriel	Middle	Autism	Proloquo2Go
<i>3</i>	Tina	Middle	OHI	Proloquo2Go
<i>4</i>	Matteo	High	ID	Proloquo2Go

Case One

There were four participants within the first case in the study: Amber (student), Kelly (mother), Lily (Special Education Teacher), and Kim (SLP). Amber was an eight year old second grade student with autism who uses an AAC system. At a young age Amber was non-verbal, meaning she communicated mostly through visual sign language and gestures. Amber did not produce words or word approximations, however, currently she is able to produce verbal speech and communicates using her speech and her AAC system. Amber began using her current system, an iPad with access to the Proloquo2Go app, when she was in Kindergarten. This app provides a customizable layout which gives students access to core vocabulary words. This app also provides the opportunity to add vocabulary specific to the student. After three years of use, Amber is proficient with her system. Amber used her AAC system at home and school. She was able to find and add vocabulary needed and was able to

type messages into her system to communicate. Before Amber received her current system, she utilized a Picture Exchange Communication System (PECS) from the age of two and a half until she transitioned to Proloquo2Go.

Amber’s mother, Kelly, participated in this study providing a great deal of information about Amber’s journey with AAC systems. Kelly is employed at the school as a cafeteria worker. She described her daughter as “a very happy little girl, very friendly, likes to make friends.” When asked how the community views Amber, she commented that “she brightens everyone’s day.” Lily was Amber’s special education teacher. Lily was a first-year teacher and was unfamiliar with Amber’s AAC system when Amber first entered her classroom. Amber’s SLP, Kim, participated in this case study. She had been a SLP for twenty years, employed in two different districts. This was Kim’s first-year providing support to Amber.

Table 4

Adult participants information		
<i>Case</i>	Participant’s Name	Role
1,2,3,4	Elizabeth	AAC Coordinator
1	Kelly	Parent
1	Lily	Special Educator
1	Kim	SLP
2	Marius	Parent
2	Laurette	Parent
2	Patti	Special Educator
2 & 3	Valerie	SLP

Table 4 (continued)

3	Paige	Parent
3	Claire	Special Educator
4	Jose	Parent
4	Sarah	Special Educator
4	Mary	SLP

Cases Two and Three

The second case within this study included five participants: Gabriel (student), Marius (father), Laurette (mother), Patti (Special Education Teacher), and Valerie (SLP). Gabriel was a fourteen year old eighth grade student who had been previously diagnosed with autism. Gabriel used an iPad with a Proloquo2Go app for his communication system. He was a novice user of this system as he acquired this system during the 2017-2018 school year. At the time of this study Gabriel used his system at school and had recently started using his system at home. Gabriel was able to verbally speak although the amount of verbal speech did not meet his desire to communicate.

Both of Gabriel's parents, Marius and Laurette, participated in this study. Both parents are well educated and work outside of the home. They are originally from Haiti where their primary language is French Creole, but they are also fluent in English and Spanish. They only speak English with Gabriel, however, he was exposed to French Creole, Spanish, and Latin within the home. The family watched Mass in Latin on the television and Gabriel's parents have noted that he can recite Mass in Latin. They described Gabriel as "a very big challenge." They spoke about

Gabriel's behavior at home and his inability to complete daily living tasks such as dressing, bathing, and eating. They also discussed his need to write all over the walls within the home. Marius talked about Gabriel's need for constant supervision for his own safety. When asked how they felt the community viewed Gabriel both parents responded "as a sick person." Marius felt that some people "might be afraid" of his son. Gabriel's special education teacher, Patti, was part of this case study. She had been a special educator for ten years, however, she only worked in this district for two years where Gabriel had been a student in her class. The SLP who worked with Gabriel was Valerie who had been an SLP for five years, however, only worked with students with CCN for four years. Valerie serviced students at the high school and middle school levels.

The third case was also a student at the middle school level: Tina (student), Paige (mother), Claire (Special Education Teacher), and Valerie (SLP). Tina was a thirteen year old seventh grade student who was just beginning to use an iPad with the Proloquo2Go app as her AAC system. Tina was able to produce verbal speech, however, it was very difficult to understand. Unfamiliar listeners were unable to understand her and familiar listeners, such as teachers and peers, were having an increasingly difficult time understanding her verbal communications due to a progression in her diagnosed genetic disease. Tina qualified for special education services as other health impaired (OHI).

Tina's mother, Paige, participated in this case study. Tina described her daughter as "funny, way more mature, beyond her age, and she can also be very quiet." When asked how the community viewed Paige, Tina commented that "they

seem to like her” but when unfamiliar individuals speak to her “she doesn’t talk back to them.” She stated that people want to get to know her daughter but it is difficult. In previous school years, Paige had resisted her daughter’s use of an AAC system because she preferred Tina to verbally speak. Due to concerns of Tina’s team, Paige recently decided to allow Tina to try this system. Claire was Tina’s special education teacher. She had been a special educator for nine years in this school district and had minimal experience with AAC systems. Valerie, who worked with Gabriel, also worked with Tina.

Case Four

The fourth case included four participants: Matteo (student), Jose (father), Sarah (Special Education Teacher), and Mary (SLP). Matteo was a seventeen year old young man who had a primary diagnoses of intellectual disability. Matteo was able to produce verbal speech, however, according to his most recent Speech-Language evaluation his utterances were largely unintelligible during connected speech. Prior to his AAC system, Matteo used gestures to try to clarify his verbal communications in all settings. Matteo, who is able to speak and understand English and Spanish, enjoyed interacting with the peers and adults around him. At the time of this study, Matteo used an iPad with Proloquo2Go as his AAC system which he has had for three years. He only used this system in school and at the time of this study did not use any form of AAC at home. Matteo previously utilized a Pragmatic Organisation Dynamic Display (PODD). A PODD is a book that contains symbols and words that people use to communicate which can include a range of topics and be used in all settings. The

PODD is designed to provide students with a greater access to vocabulary. Matteo continued to use his PODD when his iPad was unavailable to him.

Matteo's father, Jose, participated in this study. Jose's primary language was Spanish, but he was able to understand and speak English. At his request, Jose did not use an interpreter to participate in educational meetings about Matteo. Jose described his son as a "very outgoing young man." When asked how the community viewed Matteo he commented that "everyone loves Matteo, everyone." Sarah was Matteo's special education teacher and had been a special educator for six years. Sarah had taught in other states prior to coming to this district three years ago when she began working with Matteo. Matteo's SLP was Mary, she had been an SLP for the last five years. Her experience with AAC systems had been over the past three years.

Procedures

Recruitment

Following Rhode Island College IRB approval on April 26, 2018, the district's speech-language department chairperson provided an initial list of SLPs, via email, who worked with students who use AAC systems. Emails with an attached recruitment flyer (see Appendix A), were sent to those SLPs along with the special educators (see Appendix B) in the buildings in which they worked on April 26, 2018. This flyer briefly explained the research study and explained what would be expected of special educators and SLPs if they agreed to be a part of the study. Special educators and SLPs were also provided with a recruitment flyer to send to the parents (see Appendix C) of students who use AAC on their caseloads.

After email and flyer distribution, a follow-up email was sent after two weeks to special educators and SLPs who had not responded. When a response was received expressing an interest in participating in the research study, a phone call or email was made to the potential participant depending on their preference. Emails were the preferred method of contact for all special educators and SLP participants. The researcher expressed an appreciation for interest in participating in the study. A request to help recruit a student and their parent(s) within their classroom were discussed. Special educators were essential for recruiting parents for this study. Special educators reached out to the parents in their classrooms in a manner already established between the parents and special educators. Once the parent expressed an interest in the study, the special educator helped to foster communication between the researcher and the parent. In two cases it was via email, and in two cases it was a face to face meeting. The researcher reviewed the purpose of the study with parents and what would be required as a participant within the study both as a parent and for their child.

When a special educator or SLP agreed to be a participant within this study a consent form (see Appendices D and E) was hand delivered to the school in a plain white envelope. Table 5 below provides details about when consent or assent was obtained for each participant. Once the participant signed the form, they placed it back in the envelope and sealed the envelope. The participants sent an email to the researcher to indicate that the consent form had been signed and left in the school's main office. The researcher picked up the signed consent forms within one day.

Parent consent forms (see Appendix F) were placed in a sealed envelope and sent home through the special education teacher with the student. An additional white envelope was included with the researcher's name on the front. Parents placed their signed consent forms into the envelope with the researcher's name, sealed it, and returned it to the special education teacher. The special education teacher emailed the researcher to inform her that the parent consent form had been returned. The researcher then went to the school within one day to pick up the signed parent consent form. All potential participants' questions were answered prior to obtaining consent.

Assent was also acquired from all student participants. Student assent forms (see Appendix G), were read to the student by the researcher. Students then used a writing utensil to indicate on the form of their assent.

Table 5

Consent/Assent information

Participant	Date of Consent/Assent
Elizabeth	August 9, 2018
Case One	
Amber	June 7, 2018
Kelly	June 5, 2018
Lily	May 20, 2018
Kim	May 14, 2018
Case Two	
Gabriel	June 15, 2018
Marius	June 1, 2018

Table 5 (continued)

Laurette	June 6, 2018
Patti	June 4, 2018
Valerie	May 10, 2018
Case Three	
Tina	June 19, 2018
Paige	May 23, 2018
Claire	May 10, 2018
Case Four	
Matteo	June 8, 2018
Jose	May 24, 2018
Sarah	May 9, 2018
Mary	May 9, 2018

Data Collection

Initial interview. Interviews are one of the most important sources in a case study (Yin, 2014). At the beginning of each interview, the researcher tried to build a rapport with the participants whom the researcher did not have a prior relationship. At each interview, the researcher conveyed her background in education, the doctoral program involved, and the purpose of the interview. The purpose of an interview in a case study is to obtain descriptions, interpretations and perspectives of others (Maxwell, 2013; Stake, 1995). Each participant was informed that the researcher was seeking their perspectives about AAC systems. The researcher let each participant

know there were no right or wrong answers; it was their opinions and experiences that this study was seeking. An initial set of interview questions (see Appendices H, I, J, and K) was utilized to start off the conversations. These questions were unique to the role of the participant within the study. Follow-up and clarifying questions were also asked of participants as the interview progressed. As interview transcripts were analyzed, additional questions were asked of participants as needed. All but one student interview was audio-recorded. Tina's mother did not grant consent for her daughter to be audio-recorded because she thought it would make her daughter too nervous to answer questions. Consent was acquired to audio record the interviews for all other participants. The use of two recording tools, a cell phone and a digital voice recorder, was used to ensure all important information was captured. Once the audio file was successfully transferred to a secure password protected computer in a password protected file, the audio file was deleted from the digital recorder and the cell phone.

All but one interview was conducted within the school setting. Most interviews took place within the school's conference room. Four interviews took place in an empty classroom. The classroom door was locked to avoid unexpected interruptions. One interview took place in a participant's home. The length of the interview varied between participants. The student participants were the shortest interviews, they did not last longer than fifteen minutes. The students had a familiar adult in the room when the interview was conducted, however, that individual did not sit at the table with the student when they were being interviewed. Interviews conducted with parents, special educators, and SLPs averaged thirty minutes in length.

The interviews for case one occurred between June 5, 2018-June 18, 2018. These interviews all took place within the elementary school setting at a location agreed to by the participant. The first interview was with Kim, Amber's SLP, on June 5, 2018, in the school's conference room which lasted for thirty-one minutes, during Kim's planning time. The next interview, in this case, was with Amber herself on June 7, 2018. This interview took place immediately following her observation in Amber's classroom. Her teacher was in the classroom as the researcher conducted the interview to ensure Amber felt comfortable and safe. Amber and the researcher sat at a round table with Amber holding her AAC system on her lap. The interview was short, five minutes forty-four seconds, as Amber had a difficult time answering some questions and was uneasy about the change in her routine. The next interview was with Lily, Amber's special education teacher, during her unassigned time in her classroom. The interview lasted exactly thirty-one minutes. The final interview in case one was with Kelly, Amber's mother. This interview took place for thirty minutes and fifty seconds on June 18, 2018, in the school's conference room. The researcher took brief notes during each of the interviews about the participant's responses as well as one page of notes after each of the interviews about the researcher's impression of the interview as well as noting specific comments made by the participants that the researcher found interesting.

The interviews for the second case in this study occurred from June 6, 2018-June 19, 2018. Gabriel's parents, Marius and Laurette, were the first to be interviewed in the school's conference room. Their interview lasted forty-four minutes and twenty-eight seconds. The researcher took many notes during the interview because

both Marius and Laurette speak with a heavy accent. The researcher also took many notes after the interview as she went back and reviewed the notes taken during the interview to make sure Marius and Laurette's views were documented clearly. Gabriel was interviewed next, at a large table within the classroom. His classroom teacher sat at her desk during the interview which lasted four minutes and fifty-eight seconds. Gabriel's teacher, Patti, was interviewed later that same day within her classroom. Patti was interviewed within her classroom setting at the end of the school day for twenty-four minutes and thirty-two seconds. On June 19, 2018, Valerie, who is the SLP in case two and three, was interviewed during her unassigned time in the school's conference room for thirty-eight minutes and fourteen seconds. The researcher used two separate sheets of paper to document notes about responses Valerie made about each of the students with whom she serviced.

The interviews for the third case occurred June 11, 2018, through June 19, 2018. The length of the interviews for this case was completed in less time because Tina had just begun using her AAC system; therefore, some of the participants had a difficult time answering some of the interview questions. Paige, Tina's mother, was interviewed in the school's conference room for twelve minutes and fifty-two seconds. Claire, Tina's special education teacher, was the second interview on June 14, 2018, in the school's conference room for fifteen minutes and fifty-four seconds. The last interview for this case was with Tina. She was interviewed within her speech therapy classroom with her SLP in the room with her. Valerie was chosen to be in the classroom with Tina during her interview because she was still learning to use her AAC system and Valerie was there in case Tina needed help constructing her

responses. Tina did not end up needing any assistance because she was able to generate all her messages independently. Her interview lasted for five minutes and thirty-two seconds.

Interviews for the fourth case took place from June 5, 2018, through June 12, 2018. The researcher took brief notes during each of the interviews and one page of notes about initial reactions to the responses after the interview. The first interview was with Mary, Matteo's SLP. This interview took place in the SLP's classroom for thirty-two minutes and forty-eight seconds. Mary was interviewed early in the morning before school started as this was a convenient time for her. Matteo's special education teacher, Sarah, was the next interview completed in this case. Sarah was interviewed on June 7, 2018, in her classroom at the end of the school day. Her interview lasted for twenty-five minutes and seventeen seconds. Matteo was interviewed after his observation for five minutes and thirty-seven seconds in one of the classrooms he and his peers worked. His teacher was in the classroom during the interview but did not sit at the table with the researcher and Matteo. The last interview occurred with Jose, Matteo's father. Jose was interviewed in the morning after dropping Matteo off to school. He was interviewed in one of the conference rooms at the high school for fifteen minutes and thirty-one seconds. The researcher took many notes during and after the interview because Jose had a heavy accent. The notes were taken to ensure that Jose's perceptions were accurately documented.

The last person to be interviewed was Elizabeth on August 9, 2018. Elizabeth requested to be interviewed in her home because it was convenient for her at the time. Because Elizabeth was involved in all of the cases and because her role within the

district is so vast her interview lasted the longest at one hour, thirteen minutes, and forty-two seconds. The researcher took notes during the interview as well as two pages of notes after the interview was completed on interesting comments that were made and thoughts about links to responses to other interviews.

Observations. Student participants were observed using their AAC system which is reflected in Table 6 below. Observations of a technology being used is an invaluable aid to understanding the actual use of the technology and any problems that may occur (Yin, 2014). The observations took place within the students' classroom setting. Students were observed for one hour, a student observation guide (see Appendix L) was used during the observation. The researcher used the observation guide to document the types of messages being produced, the length, if the message was acknowledged, and who the message was directed toward. The researcher also used this document to take detailed notes about the environment and how often the student used their AAC system to communicate. Observations provide the researcher with a greater understanding of the case (Stake, 1995). Each student was observed for one hour to determine AAC system use in authentic environments.

Table 6

Observation details

Participant	Date	Location
Amber	June 7, 2018	Classroom for occupational therapy and Math classroom
Gabriel	June 4, 2018	Math and ELA classroom
Tina	June 14, 2018	Social group classroom
Matteo	June 8, 2018	ELA classroom

Documents. Several documents were utilized within this study to help understand the student using an AAC system and the documentation needed to acquire the system. Documents help to provide a greater understanding of the case (Stake, 1995). The documents collected for this study were requested to allow the researcher another way to further understand the student as well as providing an understanding for the need of an AAC system. Yin (2014) states the most important use of documents is to corroborate and supplement evidence from other sources. Table 7 below provides information about when the documents were collected and reviewed. The documents requested for this study were the students' current and previous IEPs. Also requested was the student's current and previous speech-language evaluations. In some cases due to the age of the student or the lack of availability of evaluations only the most recent evaluation was collected for review. Also requested was the SETT framework for each student to demonstrate the decision-making process for the current AAC system being used by the students.

Table 7

Dates of documents collected and reviewed.

Participant	Date Acquired	Date Reviewed
Amber	June 25, 2018	June 25, 2018
Gabriel	June 1, 2018	June 2, 2018
Tina	May 23, 2018	June 2, 2018
Matteo	June 25, 2018	June 25, 2018

Data Analysis

Data collection and analysis happened concurrently in this case study design. Yin (2014) suggested that the key to success is to start small, work reflectively and methodically and construct a collection of analytic strategies. Working with the data in small pieces allowed the researcher to be focused on the workload. The data both within a case and between cases was analyzed. All but one student interview was audio-recorded. The audio recordings were transcribed by a professional transcriber, however, the researcher read through the transcriptions once they were completed to check for accuracy and to ensure no data was missed.

The analytic process for the data takes an explanatory path. “To “explain” a phenomenon is to stipulate a presumed set of causal links about it, or “how” or “why” something happened” (Yin, 2014, p. 147). A general thematic inductive process was used to analyze the data. This approach looked at identifying, organizing, and offering to understand the patterns of meaning across datasets (Braun & Clarke, 2014; Creswell, 2014). The steps in this data analysis approach include the following steps:

1. Read through all transcripts and documents making initial notes/memos in the margins
2. Reread through all transcripts and documents and make adjustments to notes/memos
3. Develop a coding framework/codebook (see Appendix M)
4. Code all the transcripts and documents
5. Continuously revise codes and develop new codes
6. Generate categories

7. Document examples from transcripts of codes and categories
8. Develop general themes from categories
9. Seek corroboration from participants regarding categories and themes

Codes and categories. This case study was important to complete to obtain the real-world perspective of the participants within each case (Yin, 2014). A bottom-up approach in inductive thematic analysis allows coding of the data and analysis to be driven by what is in the data (Braun & Clarke, 2012). This allows the perspectives and voices of the participants to come through in the findings (Thomas, 2006). During the first read-through of the interview transcripts there was a total of forty-three initial codes. After careful analysis of each case individually, patterns began to emerge within the codes. The forty-three codes were consolidated, and twelve categories emerged. Included in the twelve categories are acceptance, use, efficiency, AAC systems, comfort, hopes, learning a language, experience, goals, strategies, parents, and maintenance.

After review of the twelve categories and continuous review of the data, the categories were consolidated into five main categories. These five main categories are acceptance, maintenance, training, decision-making, and use. Careful consideration was given to each category and where the topics of the original twelve categories worked together. Some codes were changed or consolidated, and some codes were added. Some codes that appeared minimally in one or two participants' transcripts across case studies were dropped. The category of use included codes such as the function of AAC systems, the purpose of the AAC, and the effectiveness of AAC systems. Further examination of the data revealed that function and purpose could be

combined into one code. Carryover was a code added to this category. This code speaks to all the various settings in which the AAC system is used. Future hope was also added to this category. Future hope discusses the ultimate “goals” the participants have in regards to AAC systems. Other codes were rearranged and put into new categories. The researcher continued to review and re-evaluate all codes and categories until the five main categories emerged.

The researcher allowed the data to do the talking, as the researcher did not want to influence codes and categories with personal feelings and experiences. This was done by reading through the transcripts multiple times. A codebook (see Appendix M) was generated with specific codes that were defined by the researcher. Once the researcher was comfortable with the categories created the researcher began looking for themes within the categories. Patton (2002) discusses how inductive analysis involves discovering patterns, categories, and themes. Developing themes involves joining or combining codes or categories that seem to share some unifying feature together (Braun & Clarke, 2012). As reflection within the categories occurred, the researcher contemplated what important pieces of information were provided within the data and generated the themes. Braun & Clarke (2012) explain how themes capture something important about the data in relation to the research question. These five categories were further analyzed to examine the connections within and between each category as they relate to the research question. The researcher took the analysis a step further to create themes which were organized to help make sense of the information provided by the participants regarding AAC systems. Some of the categories were combined together into one theme because of the information

provided by the participants. The researcher was able to create four themes from the data: “They told us about it” (Laurette), “Give our kids relationships” (Elizabeth), team approach, and working with AAC.

Trustworthiness

Role of the Researcher

The relationship of the researcher with the participants was significant. The researcher was also the data collector for this study, and readers should be made aware that the researcher was a middle school special education teacher who worked with students who use AAC systems to communicate. As Maxwell (2013) stated, “In qualitative studies, the researcher is the instrument of the research” (p. 91). It is important that the researcher conveyed a level of trust with the participants so they were confident that the results will be accurate.

It was also important that the researcher was aware of her own biases and experiences when interviewing participants so as to not influence their responses with her reactions to their answers. Through experiences as a special educator the researcher was able to see the benefits of AAC system but was also aware of the barriers. The frustration the researcher had with students leaving the school system without being effective communicators was the basis for conducting this research.

Credibility

In this research design, the researcher was collecting and analyzing the data, therefore, it was important that accurate data was collected throughout this study. To do this, the researcher was able to “integrate a process of member checking” (Baxter & Jack, 2008, p. 556). Once the interviews were transcribed, a copy of the

transcriptions was sent via email or traditional mail to each participant to ensure that the information they provided was accurate. The researcher also asked them to make any clarifications they deemed important to ensure their opinions and perceptions were successfully conveyed. All adult participants responded that their transcriptions were accurate and their thoughts and ideas were successfully conveyed. Participants responded via email except for two parent participants. These parent participants had not responded to the original mail request so the researcher contacted them via phone to ensure the accuracy of their transcripts.

Once the research was complete, a summary of the research results was also sent to all participants via email. A simplified version of the summary written in pictures was sent to the parents to share with their children. The summary included the themes and subthemes that emerged through data analysis. The researcher asked the participants to read through the summary and provide their thoughts or concerns about the themes and the results. Parents were asked to share the results with their child by reading their version of the research summary or the modified version in pictures. The researcher received a response from all special education teachers, SLPs, and the AAC coordinator. All of these participants gave a positive response to the research summary. One SLP participant, Kim, stated the results “represents my feelings accurately.” Valerie (SLP) stated that she felt her “feelings about AAC systems were represented well within the research.” Lily, one of the special educators, stated “you’ve hit upon the important aspects that we discussed and it was nice to see the similarities of opinions between the educators that you spoke with.” The researcher also heard from two parents, Kelly and Paige. Kelly felt the research

“explains how AAC device is helpful it is to children with disabilities.” The researcher did not receive feedback from any of the students or three of the parent participants.

Documents were also collected to help corroborate the findings. The student’s current and previous IEPs were collected and reviewed. Current speech-language evaluations were also obtained along with the immediately preceding evaluation. Documents can be substitutes for records of activity that a researcher could not observe directly (Stake, 1995). The IEPs show the frequency an AAC system is expected to be used. The speech-language evaluations show the students’ ability levels in the areas of receptive and expressive comprehension. This was important to understand when interviewing students.

Triangulation allows for the use of different forms of data to serve as a check on one another (Maxwell, 2013). The data generated from the interviews as well as the observations allowed for triangulation of the data. The documents such as the IEP and speech-language evaluations also contributed to the triangulation of the data. The observations, IEP, and speech-language evaluations were used to substantiate or disprove themes developed from the interviews.

Transferability

By providing a thick, rich description of the phenomenon allows for individuals to apply the phenomenon to their situation (Shenton, 2004). In each case, the researcher observed the student participants using their AAC system and provided a rich description of this observation. This will allow for individuals to draw their conclusions if their situation is similar in nature to the situations within this study.

Transferability can be achieved by future researchers to draw their conclusions based on the information provided.

Dependability

Dependability within a research study is to be able to replicate the study (Merriam, 1998; Shenton, 2004). To ensure dependability within this study, the researcher has provided specific steps utilized to conduct this study. The details provided by the researcher will enable a future researcher to conduct this study again. The description of how the data was collected and the inclusion of the codebook allows future researchers to follow the same path.

Triangulation of the data also provides a path to demonstrating dependability (Merriam, 1998). As noted above the use of documents, observations, and interviews were used together to provide triangulation of the data.

Confirmability

Triangulation is also used within confirmability to reduce against researcher bias (Shenton, 2004). Using various forms of data to substantiate or disprove themes developed also helped to confirm the results. An admission of the limitations within the research can contribute to the confirmability of the results (Shenton, 2004). The researcher provided a thick description of the research process which allows for future researchers to examine the integrity of the research results.

CHAPTER 4

FINDINGS

This chapter discusses the findings related to the research question; how do students with disabilities and their communication team describe the ideal function, training, usage, maintenance, benefits, and challenges of AAC systems across home, school, and community environments? Four main themes emerged from the data analysis. This chapter discusses the four themes and subthemes as they relate to AAC systems. The themes are organized to demonstrate the multiple steps to obtain and use an AAC system. These steps are from the beginning when communication teams are choosing an AAC system to how students and team members are working with the AAC system once it has been selected. Each of these themes and subthemes touch upon the many facets identified within the research question.

The four themes are: “They told us about it” (Laurette), “Give our kids relationships” (Elizabeth), team approach, and working with AAC. The first theme, “They told us about it” (Laurette), touches upon the decision-making process for students, parents, and educators. The participants shed light on the lack of choice when deciding about an AAC system that is appropriate. The second theme, “Give our kids relationships” (Elizabeth), discusses how AAC systems are used and where they are used. This theme reveals how the effectiveness of the AAC system is determined and how participants describe the function of the AAC systems. The second theme also explores the amount of training participants have had in order to foster the use of AAC systems. Observations demonstrated how the students are using their systems and with whom they were communicating. The third theme, team

approach, discusses how participants work together in order to provide the student using an AAC system ample opportunities to be successful. This theme discusses the strategies used when working with the AAC system. The final theme, working with AAC, focuses on topics related to the actual AAC system itself. The participants discuss their willingness to accept the AAC system and the benefits and challenges that come with the AAC systems. It explores areas such as vocabulary, acceptance, buy-in, and barriers. The barriers are those things which participants described make it difficult to use the AAC system consistently. These subthemes are found between all cases although there is some difference within cases.

“They Told Us About It” (Laurette)

The first theme identified was, “They told us about it” (Laurette), which was about the decision-making process and sheds light on the lack of choice by parents. Choosing an appropriate AAC system is supposed to be a team approach according to IDEIA [20 U.S.C. §1414(E)]. All stakeholders should be able to express which type of AAC system would be the most effective and appropriate for a particular student. Relevant subthemes within this theme included decision-making and likes/dislikes. The data within these subthemes explained how the communication team along with the student decided on an AAC system. Students, parents, special educators, and SLPs explained the process the team had taken. Each group had a different perspective on how decisions were made and the amount of choice that was provided to students and parents. Participants explained what they liked and disliked about the current system being used.

Decision-making. One commonality amongst all special educators and SLPs was that they were most comfortable with the Proloquo2Go communication app. When Elizabeth, the AAC coordinator, was asked which AAC she was most comfortable with she replied “iPads” not stating a preference for which app she preferred. She stated that, “they’re just what we have and they’re so prevalent.” Elizabeth added, “it’s not all we have” but conveyed it’s what a majority of students use. Given that so many students in the district have Proloquo2Go it gives reason to assume if the decisions being made about an appropriate AAC system are based on the comfort level of the adults or on what the student needs. The SETT framework is used to provide stakeholders with a structure for students who use AAC to participate more fully within their classes. None of the students in this study had a SETT framework for the system they were currently using. Elizabeth commented how she does not like the SETT framework because she felt it “operates on a start low, prove that it wasn’t enough before you give them more” which she does not agree with. Without a SETT framework or a full AAC evaluation, the decision about which system to use with a student appeared to be made via familiarity with a particular system.

The decision-making process for any student should be a team decision. Options and alternatives should be discussed at each meeting to determine the best avenue to take to meet the student’s needs (Mueller, 2009). Decisions about AAC systems should use the same approach. Parents were asked about the decision-making process concerning their child’s AAC system, and they had similar responses. Paige, whose daughter Tina was the most recent participant to obtain an AAC system, stated that Valerie (SLP), told her, “I’m going to use this one.” Paige commented that her

own knowledge about the AAC system was limited. “[Valerie] just went by her own experience, what she thinks would work well for her [Tina].” Paige was asked about other types of AAC systems such as a low-tech system and if it had been tried with Tina, but Paige stated that it had not been used. Paige was asked about her thoughts about features of the system her daughter Tina was using, and Paige stated, “I haven’t seen it.” Tina was asked about her role in the decision-making process. Tina stated that she did not try any other AAC systems, other than the one she was currently using. Claire, Tina’s special education teacher, was asked how the decision-making process occurred, and Claire stated that “Valerie presented it.” She was asked if Paige, Tina’s mother, was provided with options of different types of systems and Claire stated, “just that one.” Valerie, a SLP, spoke about a more formal process that occurred when choosing an AAC system. Valerie discussed how the district coordinator completes the evaluation, then whatever system is decided upon is the system presented to the parent. Valerie said, “once the process is done at the school, and they decide on one, that’s what’s presented to the parent.”

The AAC Coordinator [Elizabeth] has her perspective of the decision-making process. The communication team and/or the student frequently choose an AAC system before a complete evaluation occurs. Elizabeth explained how she liked to have students “try four or five communication apps” over a period of time, but “it doesn’t always work out that way.” Elizabeth identified a lack of time in her schedule as the primary barrier to complete evaluations. Many times Elizabeth said, “sometimes the kids have already chosen what they want.” This is due to, in some cases, another student in the classroom already having a system. Elizabeth discussed

how students often model language amongst themselves within the classroom.

Students who have an AAC system within a classroom and interact with a student who needs one can impact which AAC system a student prefers. Elizabeth spoke about her efforts to ensure parents have the resources “so they can be a partner in the decision making” for an AAC system.

Amber’s mother Kelly, was the only person on Amber’s communication team who spoke about the decision-making process for her daughter. Amber received her current AAC system in Kindergarten; therefore, her current team members were not a part of the process. When Kelly was asked about the decision-making process for the current system, she stated that “they talked a lot about it.” Kelly stated that Proloquo2Go was the only option presented to her and no other systems were discussed.

One student, Gabriel, used his AAC system to communicate his lack of choice in selecting an AAC system. His parents, Marius and Laurette, revealed the use of an AAC system was first discussed in an IEP meeting. They stated, “they told us about it. We didn’t know about it.” Both Marius and Laurette were eager to try the AAC system if “it can help.” Patti, Gabriel’s special education teacher, did not feel the parents “were informed enough about the types of AAC out there.” When Gabriel’s team was considering which AAC system to use, Patti reflected, “I don’t think anything else was really thought about by any of us.”

Matteo was the only student who stated that he was able to choose his AAC system. He conveyed “my speech teacher” when asked who helped him choose his system. Jose, Matteo’s father, claimed he was not part of the decision-making

process. Mary, Matteo's SLP, however, commented, "Oh yes, absolutely" when asked if Jose was a part of the decision-making process. Mary talked about trial periods with an AAC system for all students before making a final decision. Sarah, Matteo's special education teacher, discussed the decision-making process. Because the AAC systems did not go home for any of her students, including Matteo, Sarah commented that "the parents are kind of just involved in what we tell them" based on what occurs in school.

Likes/Dislikes. There were many aspects participants liked and disliked about Proloquo2Go. Three different professionals especially liked the various keyboards that are available. Elizabeth, the AAC coordinator, liked the typing feature because she felt, "if you can type, if you're literate, nobody can control your mouth. You can say anything you want to say." Valerie, a SLP, spoke about the word prediction feature that is available when typing. Valerie stated that her student Tina utilized the keyboard along with the icons when creating her messages. Lily, a special educator, agreed with Valerie's statement about the typing screens especially when she was "assessing [her student] Amber in spelling." Amber can use a different typing screen that does not have the word prediction feature which allows Amber to convey her knowledge. Lily also explained how she used the numbers on both the keyboard and within the math pages during her lessons. Kelly, Amber's mother, also noted that due to the AAC system, her daughter "knows ... the sounds, the letters of what she's looking for." Because of this, Kelly had noticed "she's been typing a lot."

Several participants across the cases spoke about the system giving their students a voice. AAC Coordinator Elizabeth, follows many of her students from a

young age to when they leave the district at the age of 21. She noticed, “the joy of really seeing a child come into themselves” when they received an AAC system. Sarah, Matteo’s special education teacher, spoke about the AAC systems her students used and explained, “I like that it gives my students a voice.” Sarah went on to convey, “I want to hear from them” as she discussed asking the students various personal questions. She discussed how with Matteo’s PODD, his answers were limited to the choices printed within that particular system whereas, within Proloquo2Go, he had many more options to provide his opinions. Kelly loved that it provided her daughter Amber with a way to repair a communication breakdown. She said, “What I love about it is that she [Amber] has that backup for, you know, if she’s having trouble explaining something or if she wants to express something and she doesn’t know how.”

Kelly felt her daughter’s “vocabulary has expanded” through the use of her AAC systems. Kelly stated before using an AAC system her daughter “had no words.” Patti, a special educator, liked the amount of vocabulary that a student was exposed to within Proloquo2Go and said, “I like that you’re not limited with the amount of language.” Patti also liked the assumption of “presuming competence” when it comes to providing students with the maximum amount of vocabulary. Valerie, a SLP, stated that, for her student Gabriel, she “likes that there’s a lot of vocabulary in there for him” because he was not independently accessing language on his own. Gabriel’s parent, Marius, liked that the AAC system will help his son with language development. Marius spoke about the system helping his son with “identification of what you want” and that the system helped his son “pronounce the

vocabulary” which he did not feel his son can do independently. At the elementary level, Kim, a SLP, said “what I like about it is just the child’s ability to communicate. And you can see just that language grow.”

Across all cases, the one thing that many people did not like about the Proloquo2Go was being able to find specific vocabulary. Many people liked the amount of language that was within this system but locating vocabulary was a problem. Patti and Lily, both special educators, discussed the difficulty of locating vocabulary. Patti said, “I have a difficult time finding things.” Lily stated, “There are so many folders, and it’s hard.” Valerie, a SLP, commented on the number of folders within the system. She stated, “sometimes the way they’re categorized,” she and her student Tina had such a hard time finding what they needed that Valerie said “You know what? Forget it. Let’s just move onto something else.” Mary, Matteo’s SLP, commented that while the system had become easier to navigate, she found it difficult to find words. She stated that her student, Matteo, was “getting lost in the search” when it came to finding the vocabulary to express his message. Mary found that “there will be something we’re trying to find and it does slow us down.” This, in turn, can have an impact on the level and amount of conversation that can occur. Patti, a special educator, had similar issues stating, “it’s not my primary form of communication, so it’s slow going, and sometimes it’s hard to find different items on it.”

Part of Amber’s communication team, Lily and Kim, felt that they needed more time to learn the system itself. Kim, Amber’s SLP, spoke about how one of the things she disliked about the system was “my lack of knowledge because I feel like

I'm still learning.” Kim discussed the impact learning the system had on her overall caseload. “It’s not like that’s the only thing you’re doing is learning about AAC.” As a first-year teacher, using an AAC system for the first time, Lily explained, “it’s very hard to pick up on when you automatically just need to start using it in your classroom.” She joked, “I feel like I need to sit down for like a week with my own and play around with it, in order to really understand it.”

“Give Our Kids Relationships” (Elizabeth)

The second theme identified through the data analysis was, “Give our kids relationships” (Elizabeth) which explained the many perspectives of the participants within and between these four cases about how an AAC system was used. There are five subthemes: training, function/purpose, use, effectiveness, and future hope. Participants across the cases discussed the amount of training they had received. They also explained the ideal function or purpose for an AAC system from their perspective. The participants went into detail about how the AAC system is used by their student/child across different settings as well as how they determined if the AAC system was being used effectively. Participants also explained their future hopes for the AAC systems. Parents and educators had a different perspective in this area.

Training. The importance of training was examined within this case study. Training of the parents, as well as educators, was essential to understand because these individuals are responsible for fostering the use of the AAC system with the user. Elizabeth, the AAC coordinator, was responsible for most of the training within the district. Elizabeth spoke about her training with AAC systems stating that most of her training was “on the job and continuing education.” When asked if she had any

training in college, her response was “absolutely not.” She did discuss some training when in graduate school. Elizabeth expressed that most of her “AAC classes have been through Boston Children’s [Hospital]” as well as “on the web.”

Elizabeth conveyed that she has provided professional development for teachers and SLPs within the district for the last couple of years. She stated that she had 20-30 participants in each of her professional developments. Many of the educators and SLPs stated that they had attended one of her training sessions. Elizabeth also did “classroom consultations” providing people with “the exact amount of support they want.” Elizabeth’s approach to training was “empowerment and positivity.” Elizabeth felt one of her biggest tasks was getting people to “presume competence and have faith.” Beyond her professional development sessions, Elizabeth stated she could train people “anywhere, I go to people’s homes, I go to classrooms, I meet with outside agencies.” Elizabeth added that she “just did one in Target” indicating that training occurred “wherever we’re going to be motivated and to be successful.”

Despite the amount of training time Elizabeth felt she provided, educators still stated feeling that the amount of training they received is “minimal.” Lily, a special educator, as well as Valerie and Mary, both SLPs, have all stated that they attended one of Elizabeth’s professional development sessions. Lily also shared that she has had Elizabeth “come into my room several times” to provide her with the help she needed within the classroom setting to incorporate her student’s AAC system into her lessons. Sarah, a special educator, explained how she signed up for one of Elizabeth’s professional development session, however, it was “canceled” contributing to Sarah’s

feeling that her level of training was minimal. Kim, Amber's SLP, recalled having some training when she was in college but stated it was with "low-tech systems."

Mary, Matteo's SLP, also explained that she had some training in college and graduate school but said of her training "it didn't match what is in the real world." Valerie, a SLP, remembered taking one course in college about AAC. Valerie had a similar experience to Kim in that her training was mostly in low-tech systems.

Many of the special educators and SLPs spoke about how most of their training was done on their own. These professionals completed training on their own because there was not a sufficient amount of training provided by the district. Sarah and Patti, both special educators, explained how they learned about AAC systems by "doing research on my own." Sarah stated that she "follows some families on Instagram" to further her own knowledge about AAC system use. Claire, a special education teacher, utilized the summer for some training, stating that the training was too basic and she did not learn anything new. Some of the SLPs discussed how their training was through "real-life" experiences with their students. Mary, a SLP, discussed how working with her students had helped her to learn more about AAC systems. Mary also stated that she has had some training through "online courses." Valerie, a SLP, claimed she took "online classes" as well. Kim, Amber's SLP, talked about how the amount of training she had has been "minimal" and on an "as needed" basis depending on "whether or not I've had students who have had to use a system."

Most of the parents in this multiple case study stated they had received some training about their child's AAC system. When parents discussed their training in their interviews, however, many stated this training was not enough, and they needed

and wanted more training. When Jose was asked if he received training for his son Matteo's AAC system, he stated, "No, no training." All other parents discussed how their training was part of an IEP meeting. Kelly claimed she did not think she "got much training on it" and explained her training was "just went through a little bit of it at the IEP meeting." Kelly felt that Proloquo2Go was "pretty much self-explanatory" and that "it wasn't that hard to learn." Kelly also discussed the training she received on her daughter's previous system, PECS. She commented that it was not a "training training" but more "like a meeting." She discussed how at the meeting "they would model it for me" by demonstrating the process with Amber. Kelly further commented that the training of the PECS system was "more like just observing." "We need more training" was the input from Marius and Laurette about their son's AAC system. The training they received was at the end of a Making Action Plan (MAP) meeting for "just a few minutes." At the time of Paige's interview, she stated that she had not had any training on her daughter's AAC system.

Function/Purpose. In this multiple case study, a majority of the adult participants agreed that the function or purpose of an AAC system was to communicate better. Through this improved ability to communicate, AAC Coordinator Elizabeth, believes it will "give our kids relationships and joy and freedom." Mary, a SLP, discussed how the ability to communicate should occur "in all different settings." Patti, a special educator, concurred stating that part of the function of an AAC system was to "be more integrated into society, into schools, into their setting at home, so they can be more part of their community." All of the SLPs within this study agreed that the ability to communicate was "more than just

requesting.” While they all felt making requests was a part of communicating, they agreed that it was not solely the purpose of communication.

Students who use AAC systems have differing levels of communication skills, meaning the students each had their own set of strengths and weaknesses. Valerie, a SLP, discussed the levels of communication and she explained how she had different expectations based on students’ levels of communication. Valerie felt that “at the lowest level” students should be able to “get their needs met” and also be able to “express when something is wrong.” At a “higher level,” Valerie explained that individuals should have more of “social exchange” so they can have the experiences and benefits of “socially interacting with peers and just people in their environment.” Kim, Amber’s SLP, reiterated many of the beliefs that Valerie stated, but went on to say if the individuals can be a functional communicator, then when a conversation occurred they can be “able to participate and not just sit there.” Mary, Matteo’s SLP, conveyed the expectations for students “is a little bit different,” however, she believed that the purpose was to “ideally, just for them to be able to communicate.”

AAC Coordinator Elizabeth, felt the critical aspect was that the student must have “access” to a mode of communication. Elizabeth believed that “kids must be fully immersed in language” to provide them with the opportunity to become functional communicators. Patti, a special educator, stressed that the AAC system should be viewed as “their words” and that “you can’t take their words away.” Elizabeth made the point that we were providing them with a “system that they can grow into for their whole life-or maybe change.”

Patti and Sarah, both special educators, expressed a differing perception about the purpose of AAC systems for their students. Sarah specified that the “ideal function is clarification.” Patti stated that the “ideal function would just be to have a student be able to make requests.” She did go on to explain that the ability to communicate should occur in many settings so the student felt a part of their community. When discussing Matteo’s ability to communicate Sarah talked about the inconsistency in his ability to effectively convey his messages. Sarah stated that her student Matteo was a “great communicator unless we don’t understand him.” Sarah felt that the use of Matteo’s AAC system is for use with “unfamiliar listeners” so they “would be able to know what Matteo is talking about.” Lily, a special educator, agreed with the majority of participants that the function of an AAC system was to become an effective communicator. She spoke about how her student Amber used her AAC system and that “it’s really just when she doesn’t know how to say something or how to get her thoughts across.”

Parents tended to view the AAC system as a means to an end. All the parents within this multiple case study stated that the preferred mode of communication was verbal communication. One commonality noted within the data from all parents was how they referred to the AAC system as a “tool.” Kelly stated that Amber’s AAC system was “like a tool for her.” She felt that the function of the AAC system was to help Amber to be more “articulate” as she tended to use her system as a model for her verbal communication. Paige discussed how for her daughter, Tina, her AAC system was for when “somebody can’t understand her.” Paige talked about how the system can “bridge the gap” when Tina is having difficulty conveying what she wants to say.

Marius and Laurette described their son Gabriel's AAC system as a "communication tool" to help solve his "communication problem." They were very adamant that the AAC system was only to be used until he can speak "fluently and effectively."

Laurette stressed that she wanted Gabriel to "use it to communicate with us" as they did not feel that Gabriel "understands the importance of a conversation."

Use. The parents, educators, and SLPs discussed the various ways in which the student participants used their AAC systems and where they used them. When Matteo was asked if he took his AAC system to places other than the school he stated, "yes, field trips." When observations took place for this multiple case study, all students were observed within the school setting for one hour. Amber was observed within two different settings within the hour. During that time Amber used her AAC system eight times to communicate with an adult. Amber was prompted to use her system in five out of eight exchanges. The average length of Amber's message was two words, and all messages were comments on what she was seeing and doing. An adult acknowledged all of Amber's messages. Tina was observed during a social activity within one of her classrooms. Within the hour Tina generated twelve messages to a mix of adults and peers, her messages were mostly comments, however, she did ask three questions. The average length of Tina's message was three words. All of Tina's messages were acknowledged. Gabriel was observed using his system within a Math class. During this time Gabriel did not use Proloquo2Go, however, he did use a low-tech picture system that was created by his teacher. Within this observation, Gabriel used this low-tech system to communicate four times using a one-word message to an adult. Gabriel needed prompting to engage with his system in

three out of four communication exchanges. Matteo was observed using his AAC system within an English Language Arts class. Matteo generated four single-word messages independently and all of his messages were comments about a story he was reading. These comments were directed to adults and peers with all of Matteo's messages being acknowledged by the person it was directed to.

Paige, Tina's mother, discussed how Tina's AAC system will be used in her home. Paige stated she will have Tina use her system "if I don't understand a word." She also stated that she foresees Tina using her system at family functions and out at stores. At the time of this study, Tina did not take her system home because her system was new to her, but Tina's communication team anticipated her being able to take her system home soon. Claire, Tina's special education teacher, stated Tina will use the AAC system "if I don't understand a word, instead of having to keep repeating it." During Tina's interview, Tina was asked if her mother always knew what she was trying to tell her; Tina's response was "no." The use of the AAC system within the home may alleviate these situations. Parents, Marius and Laurette, talk about how Gabriel used his AAC system at home although he did not use it to communicate with them unless they ask him a specific question. Marius and Laurette did convey that when they go anywhere outside of the home "we don't take it out because we don't want him.....we don't want the thing to get damaged." When discussing Amber's use of her AAC system, her mother Kelly stated: "she uses it everywhere, so she's so comfortable with it." Kelly went on to say, "the way she uses it, it's amazing because she navigates it so quickly." Kelly did admit Amber used her system "mostly like at

school,” but she used it “if we go out into the community,” for example when they go “out to the stores.”

Lily and Sarah, special educators, both discussed how the AAC system their students used had enhanced their ability to generate sentences when completing writing assignments. Sarah commented on how Matteo will “use it to enhance his writing.” Lily talked about a writing assignment she completed with Amber about her favorite toy. “Without that device, I don’t know if I would have ever gotten those four sentences out of her,” Lily added.

Mary, a SLP, talked a great deal about how Matteo made his AAC system his own. Sarah, a special educator, commented how Matteo “asked for that device and waited for it” which contributed to the amount he used his system. Mary explained how Matteo used his system “for announcements at the end of the day” to the whole school. Mary went on to talk about how Matteo had “fun” with his system often putting “different voices” on his system. Valerie, a SLP, explained how Gabriel used his system as a model. Gabriel had the device “produce” the message, “and then he will say it.”

Effectiveness. Educators and SLPs were asked how they determined the effectiveness of a student’s AAC system. The data showed that many of the educators and SLPs determined effectiveness by whether or not the student “uses” their AAC system. All educators and SLPs felt that their student was using their AAC system effectively. Patti and Lily, both special educators, deemed the AAC systems their students used effective because they are “more verbal.” Lily stated that when Amber was using her system to convey a message, “she hears it and then she tries to repeat it”

which according to Lily showed “how effective it’s being because it’s making her more verbal.” As Patti talked about how she determined if Gabriel was effective with his system, she admitted she had “no raw data”, on the amount of which Gabriel used his system, but did deem it effective because “he appears to be speaking more and having more verbal language when he has access to the Proloquo.” In fact, none of the educators or SLPs admitted determining the effectiveness of an AAC system through the use of data. AAC Coordinator Elizabeth, spoke to the fact that “we need to take better data” knowing that data was not typically collected on AAC use. Elizabeth felt that asking teachers to take data on the amount of use and types of messages “would tank the system for some rooms,” meaning that teachers may feel overwhelmed and not take steps to implement an AAC system successfully.

Going forward with her new AAC system members of Tina’s communication team Valerie and Claire both discussed determining the level of effectiveness through academic achievement. Valerie, a SLP, specified that data will be taken to determine if the student has “better comprehension of the academic material.” Claire, Tina’s special education teacher, agreed with this determination stating that she will determine the level of effectiveness through “all things that are graded” to see if “what she’s understanding and what she knows of the content.” Kim, a SLP and Sarah, a special educator, both discussed their students being effective with their AAC systems because they repaired communication breakdowns. Sarah, Matteo’s special education teacher, stated that when Matteo was communicating with “unfamiliar people” he was “way more effective” with his AAC system. Kim, a SLP, talked about when Amber

was unable to get her “needs met” or if she “wants to say something and it’s not clear” how she “knows to use the talker.”

One way in which AAC Coordinator Elizabeth felt effectiveness could be determined was through IEP goals. She specified, “I think their IEP goals should show effectiveness.” It is important to note that while all of the students’ IEPs referred to an AAC system within the accommodations and modifications, only two students’ IEPs (Gabriel and Matteo) specifically mentioned their AAC systems within the IEP communication goals. In Amber and Tina’s IEPs, improvement through “total communication” was noted. Elizabeth believed that students who utilized an AAC system should have a typical goal that conveyed that the student “is going to expand their communicative function.”

Future hope. Many of the participants across the case studies talked about what they would like to occur in the future related to the AAC systems. Claire, a special education teacher, talked about how she hoped to see Tina “be a part of group discussions” that occurred in different classes. Being a new teacher, Lily was hoping that for the next school year it will be “easier for me to see what would be useful and beneficial for her on the iPad.” Lily felt she would have a better handle of the curriculum in order to know how to incorporate Amber’s AAC system on the iPad into her lessons. Mary, Matteo’s SLP, commented that she would “like to see him have it on him more,” referring to the fact that Matteo was often seen in the hallways without his system. AAC Coordinator Elizabeth, explained her future hope was to see “every single IEP goal if it’s the child’s language.” That is, Elizabeth would like to see the AAC system referred to in the IEP across all areas such as educational, physical

therapy, and occupational therapy as an example, if the student requires an AAC system to communicate effectively.

All of the parents had various perspectives about what they would like to see in the future for their children with their AAC systems. Jose would like to see Matteo “use [it] to speak in Spanish.” Paige’s hopes for her daughter Tina are for her to be “able to communicate her needs and be more interactive with other people.” Paige also has hopes for an improvement in Tina’s academics and hopes “the AAC device will bridge the gap that is missing between her social communication and her academics.” Marius and Laurette’s biggest hope was for Gabriel to use his AAC system to “understand the back and forth interaction” of a conversation. They also hoped that eventually, Gabriel will say, “I’m not going to use this device,” and instead he will “try to get it out of my brain, out of my memory.” Due to the success, Amber has had with her AAC system, Kelly’s hope is for other parents and their children. She said, “I just hope every parent looks into it because it’s such a major, major help for them. And I hope every child has the opportunity to get one because it has helped her [Amber] so much.” Kelly was very vocal about the level of improvement she has seen in Amber, going from a completely non-verbal child to a verbal child who can communicate effectively using her verbal speech and her AAC system.

Team Approach

The successful implementation of AAC systems requires a team approach, which is the third theme. Students used their AAC systems in multiple settings and individuals must work together, so the student has multiple opportunities to communicate. There are two subthemes which fall under this central theme:

collaboration and strategies. The amount of training individuals have had have an impact on the level of collaboration among families and service providers. The strategies used to implement the successful use of an AAC system is explained.

Collaboration. The individuals who provide a related service for a student with a disability are more than just the communication team in some cases. While part of the focus of this study was on the communication team, it was essential to learn how this team incorporated the expertise and opinions of other professionals. AAC Coordinator Elizabeth stated, “I think AAC is everyone’s job.” She went as far to say that every person in the school from the principal to the custodians and lunch staff has a responsibility to facilitate the use of a student’s AAC system. Elizabeth noted, “Communication is everybody’s job.” Valerie, a SLP, discussed how she often co-treats with the occupational therapist and they often “discuss ways to improve a student’s ability to access the device.” Mary, a SLP, also explained how she worked with the occupational therapist to ask “advice regarding the appropriate size and color” of the background and buttons on the AAC system. Sarah, a special educator, stated that she consults with the occupational therapist regarding the “size of a device” as well as to “determine the best case possible for the student.” She went on to talk about how sometimes “unforeseen issues arise” as they are working with the student and their system. Patti, a special educator, spoke about seeking the assistance of other service providers such as physical therapists “to make sure that the student is physically capable of operating the device.” Some special educators spoke about working together with the SLP on visuals and how to make visuals carry over from the system into lessons.

Strategies. There are many approaches to the use of an AAC system. Having everyone on the communication team using the same strategies is key to successful use and carryover of the system (Kent-Walsh & McNaughton, 2005). Engagement with the AAC systems needs to be appealing and of interest to students in order to get them to engage with the systems to communicate. All of the special educators and SLPs indicated modeling was the best approach to encourage AAC use. Valerie, a SLP, stated that “modeling the language using their device is very, very important.” Kim, a SLP, had her own iPad with Proloquo2Go on it and used her system to model language to Amber; she stated, “I’ll use the talker and then she’ll model.” Lily, Amber’s special education teacher, explained a modeling approach she used within her classroom, “I do, we do, you do” which she found to be “effective with the AAC system.” Sarah, a special educator, explained how she had students who have been using Proloquo2Go longer model the system with the use of the Apple TV in the classroom. “I put the iPad up onto the Apple TV and my users who’ve had it for a really long time kind of model it.” Patti, a special educator, felt that modeling “will improve the likelihood that the child will be more responsive to using the technology in their own life.”

Another approach to working with students who use an AAC system is to participate in preferred activities. Kim, a SLP, described how she used the AAC system to complete story time with Amber. Kim stated that she incorporated the AAC system when they “do a lot of stories and a lot of play.” Valerie, a SLP, explained how she tried to “make it fun and functional, so they are motivated to use it.” The use of an AAC system during activities such as game time was something that Mary and

Valerie, SLPs, and Sarah, a special educator, share. Sarah shared how she encouraged the students to use their system to tell their peers “whose turn it is” and “telling their peers to hurry up.” To help Matteo foster his ability to navigate his AAC system, Mary discussed how, on his own, during lessons, Matteo would find words he heard within his lessons. “I would say something, and he would find the word,” Mary commented on how this strategy also helped his peers. Mary noted that Matteo’s strategy helped his peers “because his friends would then look over and they’d be learning with him, and then they would be able to help another peer.” Patti, a special educator, talked about the importance of “talking about music, hairstyles, pop culture, and favorite foods” so they see that they can use their system for more than just answering academic questions. This way students can see how to use their AAC systems to communicate information they know or want to know about a multitude of topics.

Kim, Amber’s SLP, spoke at length about how Amber used her AAC system as a model for her speech production. “The system gave her [a] voice,” Kim said. She explained how Amber began using her AAC system to “copy what she was hearing.” Parents Marius and Laurette discussed how their son Gabriel might use his AAC system to “listen to how the device says things” so he can increase his vocabulary and learn how to pronounce certain words.

Working with AAC

In the fourth theme, working with AAC, the participants explained some of the benefits and challenges of AAC systems. Those individuals who work with students who require an AAC system have many aspects of the systems that need to be

addressed. Working with an AAC system is not an easy task, and many aspects need to be addressed in order for the AAC system to be implemented successfully into an individual's life. Therefore, three subthemes will be addressed in this section. These subthemes are barriers, acceptance, and vocabulary. Barriers to AAC addresses how individuals deal with challenges that interfere with the success of an AAC system. It also explains what individuals do to maintain these systems when they break down.

Along with barriers to AAC systems is the acceptance of the system. After barriers are discussed, findings regarding acceptance of the system will be reviewed. Positive feelings about an individual's AAC system helped with the acceptance of the system. Learning how the communication team encouraged others to accept the system as a student's mode of communication is also illuminated.

The access to the vocabulary needed to generate an individual's message is an important aspect to the success of an AAC system. If the vocabulary that is needed to generate a message is missing or difficult to access this has an impact on the level of use.

Barriers. Over the years technology has improved and become smaller and more affordable. The introduction of the iPad and the multitude of available apps have made it easier for students with CCN to be able to obtain communication systems. The AAC Coordinator, Elizabeth, who had an influence on all of the cases, commented about new and improving technology. She discussed how these communication apps "every single year they get better and better." While this was a positive it also posed a barrier with learning new upgrades and new systems. Mary, a

SLP, found this to be a barrier stating, “One of the biggest challenges is that technology is changing and advancing so quickly that it is a challenge to keep up.”

The most frequently identified barrier was the battery life on the iPad. Mary, Matteo’s SLP, spoke about how when students used their iPads all day that the battery often lost its charge before the end of the school day. Sarah, a special educator, agreed with Mary saying, “We have technology that is aging and unfortunately does not hold a charge throughout the day.” Some of the participants in this study took their systems home. Taking the system home required that families ensure that the iPad is charged completely overnight. Patti, a special educator, discussed how 50% of the time Gabriel’s AAC system is not charged, and said, “We’re really trying to encourage the families to make sure that it’s charged so that he can use it fully.”

The most important aspect to these barriers is that the students are missing out on opportunities to communicate with their peers. While some students, such as Matteo, have alternate low-tech modes of communication, the loss of the AAC system can interfere with the fostering of friendships and relationships. Lily, a special educator, talked about times when Amber’s AAC system lost its charge, “she’s missing it in a social opportunity.” Amber seemed to understand the importance of her AAC system because Lily commented that Amber “gets very anxious like she wants to use it” when her AAC system was unavailable to her.

Of the four participants who used AAC systems in this study, only two students took their systems home. Tina had recently acquired her system, and her team felt she needed further instruction before she took it home. While the goal is for all students to use their systems in all settings, Mary, a SLP, Sarah, a special educator,

and AAC Coordinator Elizabeth spoke to the fact that they had students who had taken their systems home but did not return them. Having a system that was not charged after an evening at a student's home was very different from one that did not return to school. Sarah stated that the device did not go home "due to several underlying reasons within their homes." Matteo's father, Jose, discussed how he did not use the system at home because of the language barrier. Jose seemed unaware that Matteo's system could be used in Spanish. Elizabeth spoke about how some families "can't handle the device at home." Students who leave them at home for extended periods of time were unable to be functional communicators in multiple settings.

When the issue with an AAC system was more than a charging issue, some participants within the cases all seem to turn to Elizabeth, the AAC coordinator. Valerie, a SLP, stated, "if I can't fix it, I call Elizabeth, and either she helps me over the phone or text, or at times she has to come to the school." Many other participants across the cases indicated they also turned to Elizabeth when seeking repairs for AAC systems. When asked in her interview about her ability level to complete repairs, Elizabeth referred to it as "a tier system." She may contact the Information Technology departments of various companies such as Apple, Tobii, and Dynavox to assist with repairs or she laughingly admitted, "sometimes I go out and bang it on my knee."

All student participants expressed in their interviews that they had some barriers when it came to the use of their AAC systems. All of the students were asked about the messages they generated with the use of their AAC systems. Amber was asked if people had trouble understanding her message, and she stated "yes." Tina

commented that “sometimes” people had a hard time understanding her messages. Gabriel when asked stated people, at times, had trouble understanding his message. Gabriel confirmed he also had trouble creating his messages. Matteo stated people had a difficult time understanding his messages.

Acceptance. The students in this study were all asked if they liked the current AAC system they were using; they all answered “yes.” This positive affirmation was encouraging to hear given some of the barriers that they felt they had with their systems. Valerie, a SLP, commented that Gabriel was “very protective” and “attentive” to his AAC system. Matteo who used both the PODD and Proloquo2Go was asked which system he preferred. He stated, “I like better, my device” as he pointed to his iPad.

Amber’s mother, Kelly, provided the most praise for the AAC systems her daughter had used over the years. Kelly spoke about how Amber was completely nonverbal when she was much younger. Kelly explained how Amber used to use “pointing” to try to meet her needs as well as “vocalizing.” She discussed how it was more of a “guessing game” to determine what Amber was asking for or needing. Kelly stated how this was “very difficult” during this time in Amber’s life. Her first AAC system was PECS which Kelly discussed within her interview. Kelly talked about the pictures she used as part of the PECS system, “I actually made myself a keychain that would have little ones with me to go out with.” In Kindergarten, Amber received an iPad with Proloquo2Go. Kelly was exuberant with her praise for Amber’s current AAC system and stated, “Sometimes there’s like no words like to explain like

what has happened. Because she was nonverbal for a long time. Oh my God, she blossomed.”

Across the cases, many participants discussed how the AAC system was accepted as a mode of communication for students. Many spoke about how other peers and adults within the school and home settings are accepting of the AAC systems and used them with the students. Members of Amber’s communication team Lily and Kim both spoke about how the adults in their building all used Amber’s AAC system with her. “I don’t even have to think twice about it here. Honestly. Because they just do it,” Kim stated. Lily said, “Adults seem very interested in the AAC system.” Sarah, Matteo’s special education teacher, contributed that in her school “a lot of people know and are interested in his [Matteo] device.”

Mary, Matteo’s SLP, found the same acceptance among students in regards to AAC systems. “Within the classroom, I feel the teachers and students have been very receptive and supportive,” Mary stated. The students in Lily’s classroom “love it.” Lily spoke about how “they’ll look at it and I know how fascinated they are in it.” As Paige spoke about her daughter Tina’s experience with her new AAC system, she stated: “they’re really receptive to it and actually makes them feel more comfortable.” She was referring to how her daughter’s friends reacted when her daughter began using her system in class. Tina’s peers no longer had to ask Tina to keep repeating herself which made their interactions more enjoyable and meaningful. Valerie, a SLP, felt that it was important to “be with our complex communicators initially to act as a liaison between the students.” Valerie felt there was a learning curve for both sets of communicators. “It helps to prompt the AAC user as well as prompting the peer to let

them know they can address their questions right to Tina and to remind them that she may need a little extra time to get her words out,” said Valerie. This assistance helped Tina’s peers learn that she was capable of answering them, but that it takes her a little extra time to get her thoughts out. Patti, Gabriel’s special education teacher, felt that if a teacher can get the adults on board with the AAC systems, the students will follow. Patti stated, “after this staff member began using the device to chat, other regular-education peers also began interacting with the student more.”

When discussing AAC systems on an iPad, Valerie, a SLP, felt “we’re such a techy society that it’s more acceptable.” Parents Laurette and Marius discussed the perception people would have of their son Gabriel when using his AAC system in the community and how it would make Gabriel feel. Laurette stated, “So I don’t think he will be ashamed for him to use it, because it’s like the year of – the era of devices.” Laurette discussed how in her occupation people used their phones or iPads to look up information all of the time. She felt that people would view it like any other device. Kelly spoke about her experiences when her daughter, Amber, used her AAC system in the community. “They actually think it’s very interesting. Because it looks like a regular iPad” she said.

Vocabulary. Determining the vocabulary students are exposed to is a part of working with AAC systems. AAC Coordinator Elizabeth, believed that students should be exposed to as much language as possible to be able to communicate. She commented that the iPad apps provided for AAC are “going to be a robust communication app” so students will have access to “thousands and thousands of words.” Elizabeth often spoke about “presuming competence” when she discussed

how much vocabulary to provide to students. Matteo was asked about the vocabulary within his AAC system, and he confirmed there were times when he had wanted to say something but the vocabulary was not in his system. The same question was posed to Gabriel, however, his answer was “no.”

All of the special educators and SLPs stated they would be willing to add vocabulary to the AAC system. Many of these participants had already added vocabulary, specifically vocabulary related to the student’s personal information. Three of the SLPs, Elizabeth, Mary, and Valerie all spoke about adding personal information into their student’s AAC system. Elizabeth stated, “You’re going to put in their friends, you’re going to put in their family, you’re going to put in their favorite things.” Valerie spoke about an “All About Me” folder within the Proloquo2Go communication app. Valerie stated, “In my opinion, you want to add vocabulary that they can use to interact with almost anyone on a social level.” The information included in the “All About Me” folder provided information about the students’ personal information as well as their favorite things. Mary offered that she always added “anything personal” to her student’s AAC system. Working at the high school level, she commented that “especially at this age” she makes sure she adds in the student’s “favorite songs” and “movies.” Kim, Amber’s SLP, has not “really had to encounter that” when determining if there is vocabulary that needs to be added. When asked if Amber has all of her personal information within her AAC system, Kim stated, “She should...I don’t go in there and check it.”

Claire was the only special educator to state that she added in “vocabulary we work on in the classroom within our novels.” She also incorporated vocabulary “from

our classroom word wall.” Mary, a SLP, discussed how she included vocabulary needed for Matteo to complete his “Friday announcements” that he did over the school Public Address (PA) system. She also stated that she added in “new jokes” for Matteo to be able to share. Patti, Gabriel’s teacher, commented how she was reluctant to add in vocabulary other than personal information. “I’m more hesitant because..... most of the vocabulary they need is already in the system,” stated Patti. Amber’s teacher Lily, discussed how she was still learning the system and did not know what vocabulary would need to be added. Lily commented, “I’m still finding out what’s in there.” She had stated that she added in “feelings” which she utilized a great deal with Amber. She also added in Amber’s friends and teachers when “she couldn’t say everybody’s names right away.”

Summary

Throughout this collective case study, the researcher analyzed the data within each case and between cases to determine the perceptions of students with disabilities and their communication team as they described the ideal function, training, usage, maintenance, benefits, and challenges of AAC systems. Through the data analysis, four themes emerged with several subthemes, which allowed the perceptions of the students and their communication team to be explained. Half of the students used their AAC systems at home. All but one student used their AAC system within the community, whether it was with their parents or educators or a combination.

Significant areas of agreement emerged around the ideal function of an AAC system. Most adult participants concurred that the function of an AAC system was for students to be able to communicate better, however, clarification and requesting was

an alternative function put forth by two educators. All of the SLPs were in agreement that requesting, while an essential aspect of communication, was not the ideal function of communication for students who use an AAC system.

Training was an important aspect of AAC system use since the communication team was responsible for fostering the use of the system. Parents, educators, and SLPs, with the exception of the AAC coordinator, have had minimal training.

Training for parents appeared to have mostly been done within an IEP meeting for a short session. Many of the educators and SLPs discussed how they have done their own research on the use of AAC systems. They also conveyed how they have attended a professional development taught by the AAC coordinator for the district. Many of the adult participants had stated they felt they need more training as it related to AAC.

Observations provided a snapshot of how students were using their AAC systems within the classroom. Educators spoke about how the AAC system had helped students' to demonstrate their academic knowledge. AAC systems were used in a variety of settings within this study by students such as school, home, and community. Some of the student participants used their AAC system as a model for their own verbal communication. They generated their message on their AAC system, played the message, and then repeated the message verbally. For at least one student this strategy had helped to increase spontaneous verbal communication.

The AAC coordinator appeared, according to the data, to be the one responsible for maintaining the AAC systems when they broke down. The AAC coordinator had access to the IT departments to some of the companies of the AAC

systems used by the students in this school district. The vocabulary included within the AAC system, and the vocabulary which needed to be imported into the AAC system is addressed within this study. Many of the members of the various communication teams discussed the amount of vocabulary already within the Proloquo2Go, indicating that the student's personal information was the main vocabulary that was typically added to the AAC system.

The benefits of an AAC system are evident throughout this case study. All students stated that they liked their AAC systems. Providing students with the ability to communicate in multiple settings was a significant benefit of the AAC systems. Many of the educators and SLPs liked the amount of vocabulary provided to students, and competence is presumed. The acceptance of the AAC system as the student's voice was expressed across the cases. Members of the communication teams expressed how the student was able to have a voice to communicate with their AAC system and how this was a major benefit.

The challenges of an AAC system were based on how well the system works. Many of the adult participants' expressed frustration with the battery life of the AAC systems. In all four cases within this study, it was the battery life of the iPads the students used which created a barrier and limited the student's ability to communicate. While many participants liked the amount of vocabulary within the communication app the student's used, it was also a barrier because participants, at times, had a hard time locating the vocabulary they wanted or needed. Students expressed at times people they were communicating with had difficulty understanding their message.

The significance of these findings and their implications will be discussed within Chapter Five.

CHAPTER 5

DISCUSSION

Summary of the Study

According to Paulo Friere (2014), there can be no true education without a student's ability to communicate. There are many laws and policies within the U.S. (e.g., IDEIA) that address the communication needs of individuals with disabilities. A Communication Bill of Rights was created by the NJC to bring attention to the fact that all individuals with a disability have the fundamental right to influence their lives through communication (Brady et al., 2016). Schools are responsible for supporting students with a wide variety of intellectual abilities to provide them with many life activities (Danforth, 2008). The use of an AAC system with students who have CCN required focused instruction so that students may use their systems to become effective communicators. The interest in this research topic came after examining the literature regarding AAC system use by students with CCN and this researcher's own experience with students who use AAC systems. The researcher is concerned with the number of students with CCN entering the adult world without an effective way to communicate. This researcher wants to give a voice to all the students and their communication team to ensure the best outcome for the student, which is to become an effective communicator.

For this study, the researcher took a collective case study approach in which there were four cases over three academic levels. This approach was used to address the research question which was: How do students with disabilities and their communication team describe the ideal function, training, usage, maintenance,

benefits, and challenges of AAC systems across home, school, and community environments? Students were observed in their educational setting to observe how they authentically used their AAC system. Semi-structured interviews were completed with all participants, including students, using their AAC systems. A general inductive analysis was used to analyze the data within this study. Credibility measures such as member checking, and triangulation, were used to uncover the four overarching themes: “They told us about it” (Laurette), “Give our kids relationships” (Elizabeth), team approach, and working with AAC.

Discussion of Findings

Using the findings from Chapter Four and looking at the results through the lenses of Disability Studies and Ecological Systems Theory as well as a review of the literature, the researcher was able to determine how students and their communication team perceive the many facets of AAC systems. Throughout this case study, students and their communication team conveyed their perceptions about the many aspects of AAC systems which impact the level of success across multiple settings. The subsequent findings discuss the important facets of AAC system identified in the research question as perceived by the participants.

Decision Making

Decision-making while not a part of the original research question was an important aspect that needed to be explored. Once the initial determination is made that a student needs an AAC system, the team must then determine which system best meets the student’s needs. The decision-making process did not appear to follow any formal decision-making process. A SETT framework was not completed for the

students to help determine an appropriate AAC system. The following results reflect how the communication teams in each case chose an AAC system.

It is essential to select a system that meets the student's communication needs as well as match their ability to engage with the system. This means if a student has any physical challenges that would limit their ability to access the system this must also be considered. One way to complete this is through the use of the SETT framework. None of the students within this study had a SETT framework for the AAC system they are currently using. The SETT framework is meant to support student participation and achievement (Zabala, Bowser, & Korsten, 2005). Each member of the communication team is supposed to contribute to the SETT framework including the insight of parents about their child. Moore (1993) found that parents should be an integral part decision making for their child as they are experts on their children. As the child moves between two settings, the mesosystem, it is important that parents are a part of the decision-making process for an AAC system. The SETT framework would help to support parent involvement in this decision-making process. Through interviews with all the parents across all four case studies the data showed while they did not express a feeling of not being valued, they also did not have a choice in which AAC system was chosen for their children. Each of the parent participants discussed how they were "told" which AAC system their child would be using within an IEP meeting. The findings of this case study were similar with a study completed by Bailey et al. (2006a), which found that some families allow the schools to make all the decisions when choosing an appropriate AAC system. The parents

within this case study all agreed their child needed an AAC system, but they were not a part of determining which AAC system would be best.

The decision making process for special educators and SLPs according to the data was based on their comfort level with a particular AAC system. All of the students within this case study used the same AAC system, Proloquo2Go. Other than low-tech systems, Proloquo2Go was the high-tech system that all the professional participants seemed to be most familiar. The professional participants discussed what they liked about Proloquo2Go. One main reason was the AAC system gave their students a voice. The use of the AAC system provides the student with a way to be a part of their community as well as demonstrates linguistic competence.

Function

Most of the professional participants were in agreement about the function of an AAC system. Most of the adult participants discussed how they felt the function of an AAC system was to improve the student's ability to communicate. Based on a student's ability level some SLPs had different levels of expectations for a student's progress. Despite the varying levels of expectations, all professionals felt the basic needs of a student should be met through communication. This coincides with the Communication Bill of Rights by the NJC (2016) which states that communication is a basic human right. SLPs also were in agreement related to the ability to make requests. All the SLPs felt that requesting was an important aspect of communication, but felt it is not the only aspect of communication. The ability to make requests should be taught, but it should not be the only skill that is taught to students with CCN. Part of being socially competent one must be able to ask questions of others to

show interest in what people are talking about (McNaughton et al., 2008). This among many other skills should be taught to promote social competence.

Only two educators expressed a different opinion about the ideal function of an AAC system. One educator felt the ideal function was to make clarifications. Sarah expressed, based on how her student used his system, that clarification was the ideal function. This is part of strategic competence to be able to use an AAC system to repair a communication breakdown (Beukelman & Mirenda, 2013; Light & McNaughton, 2014; Lloyd et al., 1997; McNaughton et al., 2008). While it is essential to repair communication breakdowns all aspects of communication should be focused on to ensure effective communication. Patti is the only other educator with a differing opinion on the ideal function of an AAC system. She felt the ideal function was to make requests for what the student wants/needs. The SLPs agreed this was an important part of communication; however, it was only one aspect of communication. Sharing expectations for an AAC system amongst the communication team and with the student about the ideal function will assist with ensuring all aspects of communication are addressed. This will also help to make sure that all contributing members have the same or similar goals for the AAC system.

Parents within this study all have the same ultimate outcome as it relates to an AAC system. All the parents were looking for the same outcome, which was that their child will be able to have effective verbal communication. While parents conveyed the ideal function of an AAC system was to be able to communicate, they all viewed the AAC system as a “tool.” McCord and Soto (2004) found that some families did not acknowledge the process of using an AAC system as talking. SLPs and educators

often referred to the AAC system as the student's voice while parents referred to it as a tool. It is important for professionals to understand family values, beliefs, traditions, expectations, experiences, and priorities (Parette & Angelo, 1996), as a part of the macrosystem, to understand how a family will ultimately view and use an AAC system. Providing parents with training and education about AAC systems will help them to understand the viewpoint of other team members.

Training

Operational competence is an important aspect of AAC use and is achieved by those who support the use of an aided AAC system (Beukelman & Mirenda, 2013; Light & McNaughton, 2014; McNaughton et al., 2008). This means that the training of each individual who supports a student using an aided AAC system is vital to the success of the system. Elizabeth, the AAC coordinator within this study, felt she had an adequate amount of training. She received training through Boston Children's Hospital as well as on the job training. Since Elizabeth does most of the district's training it is imperative that she has achieved operational competence. The individuals who assist students the most with learning to use their AAC system is the SLP and the special educators, therefore, it is important they receive an adequate amount of training.

The rest of the participants expressed the same sentiment about their level of training, which was they felt they had a minimal amount. A lack of training would interfere with the obtainment of operational competence. The special educators and other SLPs revealed they had taken a professional development course with Elizabeth, however, they all felt they needed more training. Many expressed that they also

completed training on their own via the Internet. Special educators and SLPs are the primary support person for the students as they learn to utilize their AAC systems. This data corroborates DeBortoli et al.'s (2014) findings that when a SLP's own experience is limited assisting in incorporating AAC systems into a student's day can be difficult. SLPs and educators both discussed how they had difficulty finding the vocabulary they were looking for. Valerie, a SLP, explained how she gave up looking for vocabulary she needed when working with her student Tina. More training with the AAC system may avoid situations such as these. With minimal training provided to these individuals, it is difficult to confirm a significant amount of operational competence by the educators and SLPs.

The operational competence of parents overall is minimal due to a lack of training. Elizabeth also trains parents when requested, but had trained only one parent in this case study; as a result, Amber's mother was the only parent to feel she was competent with the AAC system. It should be noted that Amber has had her system longer than other student participants. The training of parents within this study seemed to occur during an IEP meeting. Despite the access to the AAC coordinator, parents only received a limited amount of training at the end of a meeting. Matteo's father stated that he had not been trained by anyone to use his son's AAC system. As noted in Chapter Two the influences within a child's environment have an impact on the amount of success they will have with those they interact within their environment (Lloyd et al., 1997). In the mesosystem, the various settings a child moves between has an impact on the developing child (Bronfenbrenner, 1979). Therefore it is important that individuals can communicate effectively within these settings. Only

half of the students in this study used their AAC system within their home environment. The lack of parental training may be related to this occurrence.

Use

The use of the AAC systems within this study occurred in a variety of settings. Special educators and SLPs felt the ability to communicate should happen in multiple settings. The use of the AAC systems in multiple settings would fall under Bronfenbrenner's (1979) mesosystem. Lloyd, Fuller, and Arvidson (1997) stated that social competence is gained from using communication in various settings. By encouraging the use of communication systems within the school, home, and community students can build their social competence. Few of the students within this study used their AAC system within multiple environments. All of the student participants utilized their systems within the school environment to assist with their communication needs, however, not all of them used their AAC systems within their home or community. Two students utilized their AAC system within the home environment, which is part of the microsystem, although one parent stated the use of the AAC system was not fully needed within the home due to an improvement of the student's ability to communicate verbally. Two students used their AAC systems within the community either with their family or with their special education teacher.

The lack of use of the AAC systems within multiple environments limits the individual's ability to be a part of a democratic society. The adult participants within this study discussed the importance of the students who use an AAC system being an effective communicator, however, there are no assurances for the students to use their systems within multiple environments consistently. The use of an iPad as a

communication device seemed to be accepted by all of the participants because they were familiar with the use of this device. Several of the participants discussed the fact that the AAC system was within an iPad fostered greater acceptance of the system within multiple environments, which is part of the mesosystem. When the system is not used within the community the student, in essence, has no voice, therefore, cannot participate within a democratic society. The lack of use within multiple settings coincides with Kintsch and DePaula's (2002) finding that the abandonment of the AAC system potentially causes a loss of freedom and independence. The acceptance and use of the iPad by a wide variety of individuals should be a strength in fostering the use of communication systems, run on an iPad, within the home and community setting.

The lack of use of an AAC system within the home environment impacts the student's ability to demonstrate linguistic competence. The home environment is part of the microsystem, and when families support the AAC system the individual will have more success (Chung & Stoner, 2016); this is demonstrated through the first case within this study. Amber has used her system the longest of all the student participants in this study. Her mother has embraced her AAC systems from the beginning, but when she received her current system, she felt that Amber blossomed. Amber used her system within the school, home, and community environments. The use of her AAC system in more than one setting allows her to participate in each of these settings actively. The other students in this case study do not use their systems in all three environments. Individuals have the fundamental human right, according to NJC (2016), to make a difference through communication to their environment.

Without the use of their AAC system, it will be difficult for these students to affect the conditions in which they live.

The effectiveness of an AAC system is important to determine the level of use. The special educators and SLPs all agreed on how they determined effectiveness which was by observing how often a student used their AAC system. The participants did not discuss whether the students were generating appropriate messages when they determined effectiveness, only if the student was using the AAC system. All of these participants stated that they did not collect specific data on how often a student used their AAC system or for the types of messages generated. Due to the lack of data, the determination of effectiveness is subjective to who is making the decision. The lack of data then creates the issue as to whether an AAC system is the most appropriate system for the student. The perception of the educator and SLP as to how often a student should be using their AAC system is connected to the effectiveness of use. It would also be different from educator to educator making it difficult to determine the actual level of effectiveness from academic level to academic level and even grade to grade. AAC Coordinator Elizabeth, discussed this fact in her interview when she shared her frustration regarding students who use their systems effectively when in one grade but do not use it effectively in another grade which sometimes leads to the abandonment of the AAC system.

Maintenance

The maintenance of AAC systems can also be a challenge to the successful use of a system. While all of the students in this case study used an iPad with the Proloquo2Go app, the iPads and apps were of varying ages. The aging level of the

technology is a concern of many of the educators and SLPs. Participants did not report within their interviews any significant breakdowns of the iPads. Some of the participants discussed the rare times a system needed a repair, and they tried to fix it themselves. They go on to discuss that if they cannot fix the issue, they elicit the help of the AAC Coordinator Elizabeth. She, in turn, tries to fix the systems herself, even at times, banging it on her knee. Elizabeth also accesses the assistance from the IT departments of the various apps and devices. The exosystem includes those individuals who do not interact directly with the individual but have an impact on development (Bronfenbrenner, 1979). The relationship Elizabeth has with various IT departments to repair the iPads when they break has an impact on the individual and their ability to continue to communicate. The level of maintenance appeared to be minimal within this case study which ultimately means the students are not without their communication systems for extended periods of time for repairs.

Benefits

The ability to improve communication skills through the use of an AAC system is a major benefit. This is especially seen in the first case in this study. Amber, who has had her system the longest, went from being non-verbal using gestures to communicate to be able to communicate effectively through the use of her AAC system as well as verbal communication. In the other three cases the students have all made some gains towards effective communication. Examples were provided of ways in which the students were able to use their systems to communicate with those around them. Demonstration of strategic competence is documented within case four when participants discussed how Matteo can repair communication breakdowns

with unfamiliar listeners who were having difficulty understanding what he was trying to say. For students who used verbal communication, but are not fully understood by those around them it was imperative that they were able to have the ability to have an alternative and effective ways to get their message across.

For students to be able to communicate completely and convey any message they want, it is important they have an AAC system which contains all necessary vocabulary. The educators and SLPs in this study all felt the current system each of the students was using has a plethora of vocabulary. While the educators and SLPs stated they would add academic vocabulary if needed, most of the participants conveyed that they had not added academic vocabulary. The only vocabulary the SLPs felt was necessary to add into the AAC systems of their students was personal information. Providing the students the ability to share their name and personal information allows them to form more profound and more personal relationships with those around them.

Building relationships with friends and family are documented throughout this study. All of the students and most of the parents like their AAC systems currently being used. Students have demonstrated an affinity to their systems whether it is through their actions of how they interact with their system or by expressing they preferred their current AAC system over previous systems. Many adult participants discussed how other students in the school or classroom were fascinated by the AAC system. They commented on how other students were eager to use the system with the student participant. This level of acceptance and willingness to interact with the AAC system is promising when building peer relationships. The use of an AAC system in

Tina's case actually made her friends more comfortable to have a conversation with her. Due to the level of technology used in today's society the use of a communication app on an iPad allows for acceptance for this mode of communication.

Challenges

There are some challenges to using an AAC system to communicate. The first challenge is that it is not a natural way to communicate. Therefore, there is a level of training that must occur to use these AAC systems effectively. The one overwhelming consensus throughout this case study was the lack of training by a majority of the participants. Each of the adult participants discussed some level of training, but with the exception of the AAC coordinator, none of the participants felt they had an adequate amount of training to be able to assist their children or students effectively. This lack of training can have an impact on the use and effectiveness of an AAC system. A majority of the students in this case study did not use their AAC systems in multiple settings, the mesosystem, which is an issue that can be addressed and reconciled with more training for parents, special educators, and SLPs. Through further training, participants can learn how to incorporate the AAC system into multiple settings successfully as well as understanding the importance of doing so.

The amount of vocabulary within Proloquo2Go is a strength and a challenge according to some participants. The participants spoke about the amount of language that is provided within this communication app, however, many discussed the difficulties they have in locating the vocabulary they need within the app. Some student participants have also indicated there are times they are unable to find the vocabulary they need to create their message. The inability to locate vocabulary

required to generate a message can impede the communication process. Participants discussed how when they were unable to locate the vocabulary needed they “move on to something else.” This can be a missed opportunity to foster a relationship due to the inability to find the required vocabulary.

Another challenge cited within this case study by participants was the battery life of the iPad. Some of the iPads being used in this district are several years old. As a result, the duration of the battery can interfere with the students’ access to their AAC system. As noted in Chapter 2, there are laws [20 U.S.C. §1401(1)] which discussed the provisions around AAC systems, however, there is no specific language within the law which states the AAC system provided must be the most up to date technology. As a result, school districts work within the budgets the cities and towns have allotted. This does not always leave funding to replace aging technology for AAC systems. This shows how decisions, such as laws and policies, made within the exosystem directly impact the individual. Some challenges come with aging technology within the district, one being the battery life. The participants within this study discussed how the length of the battery interfered with the students’ ability to use their system throughout the entire school day. Special educators and SLPs discussed how the iPads were not always fully charged when they came to school, therefore, they must take the time to charge the iPads, so the student has access to their AAC system. In the meantime, the student is left without an effective way to communicate. Only Matteo had a backup AAC system available to him to use when his iPad is being charged. The rest of the students may have difficulty communicating during this time.

Communication teams should have a plan in place for when there is a malfunction or breakdown of a student's AAC system.

Reflections on the Methodology

The use of a collective explanatory case study methodology was chosen for this study because it is an organized approach to understanding qualities of a phenomenon within a particular context (Brantlinger et al., 2005), to research “how” or “why” something happened (Yin, 2014) within and across multiple cases. Combining explanatory and collective case study approaches were helpful in including a variety of participants who share a common phenomenon. The researcher is new to this research method, and as a result, the researcher's comfort level using this method is still developing. The use of semi-structured interviews, document review, and observations were used in this study.

Semi-structured interviews were used to allow the researcher the ability to ask follow-up questions probing further into the participants' perspectives. These interviews are meant to be more of a “guided conversation” (Yin, 2014) rather than a structured interview. Due to the researcher being new to conducting interviews it stands to reason that there may have been some missed opportunities for follow-up questions. Some follow-up questions occurred after all of the interviews were completed via email to ascertain further information on particular aspects of AAC systems. The interviews were recorded to ensure all vital information provided by the participants were captured. These interviews were professionally transcribed due to time constraints. These transcripts were reviewed by the researcher for accuracy and also forwarded to the participants to review for accuracy.

Direct observations were completed as a part of this case study to serve as another source of evidence (Yin, 2014). Interviews provide a verbal source of information regarding AAC systems, however, observations provide an opportunity to fully understand the complexities of the phenomenon of interest (Patton, 2002). The observation also provides an opportunity for the researcher and the reader to understand how AAC use is incorporated into the setting. By going into the setting, the researcher can convey a vivid description to the reader about what occurred and how it occurred (Patton, 2002). The vivid descriptions of the observations within this study allow the reader to immerse themselves in the school setting where the student utilizes their AAC system.

Limitations

The use of an AAC system as a mode of communication is not common, therefore, it is the phenomenon being studied. The voice of the student using the AAC system is not prevalent in existing research, therefore, it was important to obtain their voices throughout this study. The students who participated in this study ranged in levels of ability. The responses that were obtained should be considered with caution as the true level of comprehension of the questions is unknown. Since the students were only interviewed once the researcher was unable to verify their responses by asking them questions in a multitude of ways on multiple occasions. The students were interviewed once in a familiar setting but out of the routine of their daily schedule. This can cause confusion or stress upon the student and can impact their ability to answer the questions effectively. Questions would be reworded to be able to ask students in multiple ways about their opinions of their AAC system to corroborate

previous responses. It should also be noted that some student participants are former students of this researcher. One student participant is a future student of this researcher in the upcoming school year.

The researcher anticipated collecting the Student Environments Tasks and Tools (SETT) framework for each student. The researcher was interested to see through this framework how the communication team decided upon the AAC system chosen for the student. In her data collection process, the researcher discovered that only one student had a SETT framework. The SETT framework that was obtained was not for the current AAC system, but for the system that the student previously used.

When interviewing familiar participants, the researcher tried to allow the participants responses to direct the conversation. The researcher tried not to let her thoughts or perceptions enter into the conversation in order to remain neutral. In the course of developing this research study, the researcher was careful not to reveal to those she was familiar with too much about the research as to not influence their answers if they were to be a part of the study. It was harder than anticipated to recruit participants for this study. As a result, the researcher ended up with two cases at the middle school level. The researcher was hoping for a case at each academic level to be able to see any similarities or differences among the levels. The researcher was especially disappointed to not be able to have a case at the transition academy as this is the last placement before students leave the school setting for adulthood. The researcher was unwilling to contact participants more than three times to avoid them feeling pressured to participate. Recruitment of the participants occurred at the end of

the school year, given more time the researcher believes she would have been able to successfully recruit participants from each academic level. The end of the school year is a busy time for students, parents, and especially educators.

This researcher is a novice at conducting interviews. The interview process was a big part of data collection, and the researcher wanted to make sure she obtained as much information as possible. The more interviews that were completed, the easier it seemed to be, but some follow-up questions may have been missed due to inexperience. The researcher spent a great deal of time with the families in which English was not their primary language. The researcher wanted to make sure she was understanding and documenting their responses accurately. In future research the researcher would ask on the recruitment flyer if the participant would prefer the interview be conducted in their primary language.

Value of the Study

The overarching significance of this study is understanding the perceptions of students and their communication teams regarding the many facets of AAC systems. It is important to provide students who utilize AAC systems as their mode of communication the opportunity to convey their insights regarding their AAC system. Most previous studies do not include the voice of the student using the AAC system. Previous studies consist of parents, special educators, or SLPs exclusively (Bailey et al., 2006a; Bailey et al., 2006b; Breyen et al., 2007; Kemp & Parette, 2000; Kent-Walsh & Light, 2003; Light & McNaughton, 2014; McNaughton et al., 2008; Parette & Angelo, 1996; Zhang & Bennett, 2003). The value of this study is that it includes the students and their communication team to examine how they work together to

meet the student's needs best and overcome challenges. This allowed the researcher to look within each case and between cases to examine how the participants described the many facets of an AAC system. The cases stretched across three academic levels: elementary, middle, and high school. The researcher was able to determine similarities and/or differences across the three levels. The researcher was also able to gain insight from expert to novice users of AAC systems.

Understanding how individuals engage with AAC systems and the many idiosyncrasies that encompass these systems can help the school district understand where improvements need to be made to foster effective communication with AAC systems. In the age of technology students who use an AAC system experience more social acceptance (Light & McNaughton, 2014; McNaughton & Light, 2013). It is less likely that a student who uses an AAC system to communicate will be seen as having a deficit given the more social acceptance of today's technology.

Implications for Practice

The basis for the recommendations below is based on a combination of the understanding that the ability to communicate is a basic human right, and new insight informed by this research. As an educator, this researcher feels a deep obligation to ensure that all students are effective communicators in multiple settings to ensure maximum participation within a democratic society. This researcher offers implications for parents who ultimately know their child the best and will be responsible for ensuring the use of AAC systems once the student has graduated from school. Implications are also offered to special educators, and SLPs as these are the crucial participants in a student's communication team because they are responsible

for the promotion of the initial use of the AAC system and are also key contributors to training and assisting families with AAC systems. Finally, this researcher offers implications for the most important participant in this study, the student whose life is directly impacted by the success or failure of an AAC system.

The overarching implication is for all individuals from these groups to understand the importance of effective communication and the impact it has on a person's development of meaningful relationships, inclusion within their community, and overall quality of life. The more researchers can understand how students and their communication teams approach AAC systems the better school districts can produce effective communicators of all ability levels.

Parents

In regards to parents and their feelings about AAC system use for their children, the findings of this study call for us to examine approaches to the decision-making process as it relates to AAC systems, the level of training, and use of an AAC system. In Bronfenbrenner's Ecological Systems Theory (1979) the microsystem includes the environment and individuals the developing person would have the most contact with, therefore, for individuals with CCN, it is important for families to be an active participant as it relates to AAC.

One meaningful way families can have more ownership of an AAC system is to be a more active member in the decision-making process. The parent participants within this study all stated they were told about the AAC system their child would be using but were not provided with options of AAC systems to explore. A shared understanding of the student is needed in order to ascertain the best AAC system and

parents are key to this understanding. The home and school environment have their own set of benefits and challenges which require their own set of communication skills. Parents should be active members of the communication team and convey the strengths and challenges related to communication within the home environment. Interactions with extended family as well as an understanding of important traditions within the family and community should be explored as a part of the decision making process. Having a full understanding of all of the student's environments and the individuals who are part of those environments are important to the success and acceptance of an AAC system outside of the school setting.

To improve the success of AAC systems within the home and community, the parents need to convey the impact of language within their family. Some families speak a language other than English within the home which can impact the level of use of an AAC system as in Matteo's case. The communication team including the parents should have an open dialogue about which language will be spoken in the home and how the AAC system selected can be integrated. Some communication systems offer the ability to go between multiple languages which can be beneficial when a family such as Matteo's speaks only Spanish. Ensuring the AAC system the student uses has the ability to translate to a family's primary language will allow the student to develop better and more meaningful relationships within their family and community.

Parents should take an active role in obtaining training for their child's AAC system. The parents within this study stated they had received little or no training. Some parents expressed the need for more training with their child's AAC system to

help them better understand how to help their child communicate through the use of the system. Parents need to obtain a level of operational competence in order to assist their child in using their AAC system successfully. Training will also provide parents with the necessary tools and knowledge on how best to integrate their child's AAC system into their home and community settings. Parents should also encourage the training of siblings and any family members within the home so everyone can have the same approach with the child using an AAC system.

Finally, parents need to understand the significance of their child being able to communicate effectively in multiple settings. The data revealed that only one student used AAC in the home, school, and community settings. It will be beneficial if parents are able to communicate the various settings in which their child is included so special educators and SLPs can assist them in how best to incorporate the use of the AAC system. Parents should be encouraged to keep a log to track their child's use within the home and community. This information can be useful to educators, and SLPs to problem solve any issues that may be occurring within these settings that impact the use of the AAC system. If students who use AAC systems are to be viewed as an active member of their community, it is incumbent upon parents to ensure they support the use of AAC systems outside of the school setting.

Special Educators and SLPs

Special educators and SLPs need to work in conjunction with the parents to improve the success of students who use an AAC system to ensure all students become effective communicators. As the leaders of the communication team, it is essential to address the needs of these participants. This study revealed certain aspects

where improvement can be made by special educators and SLPs such as decision-making regarding AAC systems, training, and effectiveness. Educators seek the promotion of democratic communities, and interactive spaces where diverse individualities are respected and valued through the social model of disability, therefore, it is imperative that special educators and SLPs are committed to assisting their students to become effective communicators in multiple settings.

Special educators and SLPs consistently work together with parents on a myriad of topics to benefit the students. The decision-making process should not be any different as it relates to an AAC system. Creating a shared understanding of a particular student who requires the use of an AAC system is crucial to determining which system would be the most beneficial. Utilizing the areas within a SETT framework to look at all environments and skills needed by the student to be an active member will help determine the appropriate AAC system. Currently, systems are chosen by the familiarity the special educator and SLP have with a system and not necessarily what is the best choice based on the student's needs. By the communication team not utilizing the benefits of the SETT framework, the team may not be making a fully informed decision on an appropriate AAC system that will be successful in multiple settings.

For special educators and SLPs to be able to impact students' ability to use their AAC system, they need to be fully trained. All of the special educators and SLPs, except for the AAC coordinator, stated they had minimal training when it came to AAC systems. All of these professionals had attended some level of professional development related to AAC, however, they did not feel it was an adequate amount.

Many stated they had pursued training outside of their school district via the Internet or outside agencies. The motivation conveyed by these professionals to learn what they can to better improve the skills of their students is promising. One thing the AAC coordinator can do to improve the skills of special educators and SLPs is to offer layers of professional development to address the various stages professionals find their students in using AAC systems. For students who are novices with their AAC system, training can be based on strategies to incorporate the AAC system into the classroom and how to work with special educators to ensure all staff members understand the function of the AAC system and how to implement its use. As students become more fluent with their AAC systems training for SLPs and special educators can be personalized by providing training for particular systems in use. In this study, all the students are using the same AAC system, hence a training on that specific system can be provided to allow special educators and SLPs to become more familiar with this particular system. Special educators, SLPs and the AAC coordinator should also be more cognizant of the level of training parents receive. There should be scheduled times for training with and without the student to ensure optimal use of the system when they are at home and in the community. A communication log can be put into place to assist with any issues related to the AAC system.

Furthermore, to determine the effectiveness of an AAC system more data needs to be collected. Special educators and SLPs all discussed within their interviews that they assessed the effectiveness of an AAC system by whether or not a student used their system, but do not have specific data on this subject. Training can be provided to assist special educators and SLPs on how best to collect data to

determine an AAC system effectiveness. The training can provide an opportunity for professionals to collaborate on easy and effective ways to collect this data. The AAC coordinator can offer suggestions for the types of data that would be beneficial as well as how to use the data to improve the effectiveness of an AAC system.

Students

While all students conveyed they liked their AAC system, they all did not utilize them in multiple settings effectively. Moreover, only one student, Matteo, stated that he was able to choose his AAC system. Students should have an active role in the decision-making process whenever possible. Students' opinions should be sought after particularly during the initial stages. They should be provided with the opportunity to express which system they like best especially when more than one option is being offered. Teaching students self-determination skills so that they can be a part of the decision-making process, are important skills for students to obtain. In a majority of these cases, it was not clear that the opinion of the student was obtained.

Students should be encouraged to use their systems in multiple settings. This should occur even when a familiar listener knows what the student is saying, but an unfamiliar listener may not know. Students need to be instructed on how to effectively repair communication breakdowns and be able to make these repairs in different environments. When students are able to communicate effectively, they can develop meaningful relationships with peers and family. By utilizing their AAC system, they can be an integral part of a democratic society by sharing their experiences in a meaningful way. Students have a role to play in how their lives are lived. Through the use of their AAC systems, they are able to impact their lives

through communication by demonstrating social competence. Students can impact their role within their families through the use of their AAC system to convey shared experiences and develop relationships.

Future Research

There are so many aspects to AAC that it is impossible to touch on all pertinent topics in one research study, therefore this study opens up many opportunities for future research. This researcher would recommend further studies which include students who use AAC systems as a mode of communication. More research is needed where students are included, and their opinions and ideas are explored. In future research, given the population being studied, this researcher would recommend conducting several interviews over a period of time with students as well as multiple observations in different settings. This will allow the researcher to build a better rapport with students especially those students who are unfamiliar with the researcher. Improving rapport with students will allow for an improved insight on how well the student is using their AAC system as well as being able to ascertain accurate perceptions of the AAC system by asking students questions in a variety of ways. A methodological adjustment may be to conduct a focus group among parents, special educators, and SLPs. This might allow for more spontaneous conversation about the many aspects of AAC. Parents may open up more about how they feel about AAC systems when they are surrounded by other parents whose children also use an AAC system to communicate. The same can be true for special educators and SLPs to be a part of a group with shared experiences they may be more likely to express a variety of insight on their experience with AAC systems.

Individuals who require the use of an AAC system during their academic years will most likely continue to use their AAC system into adulthood. Given the importance of effective communication on a person's life, it is important to understand how the adult agencies understand their role in supporting AAC systems. This researcher would recommend a study being completed with workers in adult agencies to determine their level of competence with AAC systems as well as the level of support they provide to AAC users.

Summary and Concluding Thoughts

This study solidified some of the challenges still surrounding AAC systems as well as provided some exciting promise for the future. This researcher expected to hear different approaches from the participants at the various academic levels, however, was excited to hear that the professional participants seemed to all have similar approaches to AAC. As an educator, this researcher has prior experiences with servicing students who use AAC systems to communicate. This researcher also has experience in acquiring AAC systems for students who needed them and as a result, and has very strong opinions related to this topic. This researcher did find, at times, it difficult not to interject personal thoughts and opinions, especially when speaking to parents. This researcher was eager to interact with the students within this study. Their opinions were insightful as it relates to their ability to communicate by sharing how they feel about their AAC system and their role in choosing their systems. By including the students within this study provided a depth of understanding of the issues that surround AAC systems and the complexities to helping students become effective communicators.

The advancements of technology have made the acceptance of AAC systems greater than in years past. With the improvements of smartphones and the development of apps, it has made the use of this technology more socially acceptable which provides individuals with CCN the ability to have meaningful interactions within their community. This researcher was disheartened but not surprised that some students do not take their AAC systems home. The only student to take their system into all settings was the youngest student who surprisingly also used her system the longest. It leads this researcher to question if starting AAC at a younger age is the key to the success of these systems. The other students in this study all started using their AAC systems at the middle school level. Providing students with AAC systems at an older age limits the amount of training and experience they have with their systems before entering the adult world. This researcher was excited to hear about how parents accepted their child's AAC system. Parents seemed to understand the function and importance of an AAC system in their child's life. While they were accepting of the current AAC system, all parents made it clear their ultimate goal was for their child to verbally communicate and not use the AAC system.

The way in which some of the students use their AAC system as a model for verbal communication was a surprise to this researcher. Two of the students utilize their systems not to communicate with others directly but as a tool to generate their message then listen to the message to try to replicate it verbally. It was refreshing to see students utilize their systems in a way that works for them rather than a traditional style. This researcher learned that students should be given the opportunity to explore

their systems to determine how they want to use their system and special educators and SLPs should then adjust their approach to meet the needs of the students.

One major challenge that needs to be addressed in a timely manner is the issue of training. Parents, special educators, and SLPs should have more training as it relates to AAC systems. To assist students with CCN to become effective communicators the individuals who support them should have the information, strategies, and tools needed to foster improved communication. Despite the low level of training parents, special educators, and SLPs all continue to provide support to the student and their AAC system. This was a surprise to this researcher as a preconceived notion was that a lack of training meant AAC systems would be put on a shelf and not used. The promise that these participants persevere despite their lack of training holds the hope that if further training were provided, they would participate in this training and continue to provide improved support to students with AAC systems. Additional training may also provide improved strategies for supporting students as well as how best to determine the level of effectiveness through data collection.

Lastly, this study shows that while AAC systems have been around for many years and improvements have been made there is still more work to do to ensure all students with CCN become effective communicators. This study provides a guide for school districts on where those improvements need to be made. School districts need to examine the number of students with CCN in their systems and how many are making progress towards becoming effective communicators. If school districts are going to focus on graduating students who are productive, caring citizens who are

prepared to succeed in the 21st century society then we must ensure students with CCN become effective communicators by the time they enter the adult world.

APPENDICES

Appendix A

SLP Recruitment Form

Study of Augmentative and Alternative Communication (AAC) System Use by Students with Disabilities

Do you work with students who utilize AAC systems?

My name is Angela Palazini. I am a doctoral student in the joint Ph.D. program with Rhode Island College and the University of Rhode Island, who is looking to examine how students with disabilities use their AAC systems. I am completing this research as part of my dissertation under the supervision of Dr. LaCava. AAC systems used by students can be low-technology or high-technology systems. Effective communication is important for a productive and fulfilling life.

Would you like to be part of this study?

If you say yes, what will you need to do?

- Identify special educators you work with who also work with students who use AAC systems
- Take part in a 1 hour interview at a time that is convenient for you. If you give consent, the interview will be audio recorded to make sure answers are recorded accurately. This interview will be in regards to your student and their AAC system.

What will happen to the answers you give?

Your answers will never be connected to you or your name. The researcher will listen to your answers and combine them with the answers provided by others. The records of this research will be kept private. In any sort of report that might be published, the researcher will not include any information that will make it possible to identify you.

Contact information

If you have any questions, concerns or would like more information please do not hesitate to contact Angela Palazini at apalazini_1954@email.ric.edu. This research will be conducted under the direction of Dr. LaCava (placava@ric.edu) from Rhode Island College who is the principal investigator for this study.

Appendix B

Special Education Teacher Recruitment Form

Study of Augmentative and Alternative Communication (AAC) System Use by Students with Disabilities

Do you work with students who utilize AAC systems?

My name is Angela Palazini. I am a doctoral student in the joint Ph.D. program with Rhode Island College and the University of Rhode Island, who is looking to examine how students with disabilities use their AAC systems. I am completing this research as part of my dissertation under the supervision of Dr. LaCava. AAC systems used by students can be low-technology or high-technology systems. Effective communication is important for a productive and fulfilling life.

Would you like to be part of this study?

If you say yes, what will you need to do?

- Send study information home to families whose children use AAC.
- Given parent consent, provide access to your classroom for a 1 hour observation of your student using their AAC system during an academic class.
- Take part in a 1 hour interview at a time that is convenient for you. If you give consent, the interview will be audio recorded to make sure answers are recorded accurately. This interview will be in regards to your student and their AAC system.

What will happen to the answers you give?

Your answers will never be connected to you or your name. The researcher will listen to your answers and combine them with the answers provided by others. The records of this research will be kept private. In any sort of report that might be published, the researcher will not include any information that will make it possible to identify you.

Contact information

If you have any questions, concerns or would like more information please do not hesitate to contact Angela Palazini at apalazini_1954@email.ric.edu. This research will be conducted under the direction of Dr. LaCava (placava@ric.edu) from Rhode Island College, who is the principal investigator for this study.

Appendix C

Parent Recruitment Form

Study of Augmentative and Alternative Communication (AAC) System Use by Students with Disabilities

Do you have a child who utilizes an AAC system?

My name is Angela Palazini. I am a doctoral student in the joint Ph.D. program with Rhode Island College and the University of Rhode Island, who is looking to examine how students with disabilities use their AAC systems. I am completing this research as part of my dissertation under the supervision of Dr. LaCava. AAC systems used by students can be low-technology or high-technology systems. Effective communication is important for a productive and fulfilling life.

Would you like to be part of this study?

If you say yes, what will you need to do?

- Give consent for your child to be observed using their AAC system during an academic class for one hour.
- Give consent for your child to participate in a 30 minute interview about their AAC system during a non-academic time. If consent is given the interview will be audio or video recorded to make sure answers are recorded accurately.
- Take part in a 1 hour interview at a time that is convenient for you. If you give consent, the interview will be audio recorded to make sure answers are recorded accurately. This interview will be in regards to your child and their AAC system.

What will happen to the answers you give?

Answers will never be connected to you or your child's name. The researcher will listen to you and your child's answers and combine them with the answers provided by others. The records of this research will be kept private. In any sort of report that might be published, the researcher will not include any information that will make it possible to identify you or your child.

Study of Augmentative and Alternative Communication (AAC) System Use by Students with Disabilities

Contact information

If you have any questions, concerns or would like more information please do not hesitate to contact Angela Palazini at apalazini_1954@email.ric.edu. This research will be conducted under the direction of Dr. LaCava (placava@ric.edu) from Rhode Island College who is the principal investigator for this study.

Please check one and return to your child's teacher.

_____ Yes, I would like more information about participating in this study.

_____ No, I am not interested in participating in this study.

Parent Signature

Appendix D

Speech-Language Pathologist Consent Form

SPEECH - LANGUAGE PATHOLOGIST CONSENT DOCUMENT

Rhode Island College

Augmentative and Alternative Communication Systems for Students with Disabilities

You are being asked to be in a research study about augmentative and alternative communication use with children who have a disability. You are being asked because you have a student who requires the use of an augmentative and alternative communication system. Please read this form and ask any questions that you have before choosing whether to be in the study.

Angela Palazini, a doctoral candidate at Rhode Island College, is conducting this study.

Paul LaCava, an Associate Professor at Rhode Island College, is the principal investigator for this study.

Background Information

Many research studies are documenting the importance of augmentative and alternative communication systems for students with disabilities. Many studies research the opinions of parents or special educators, but very few studies examine the insights of all individuals involved in the training and use of the augmentative and alternative communication system.

The purpose of this research is to understand how parents, special educators, speech and language pathologist, and students describe the many facets of augmentative and alternative communication systems.

Procedures

If you choose to be a participant in this research, you will be asked to do the following things:

- **Identify students** within the district for whom you have trained and/or recommended for AAC systems.
- **Meet with Angela Palazini**, who will be asking questions about your student's use of their augmentative and alternative communication system. The length

of this interview will be 1 hour. You will be given the option to have your interview audiotaped to ensure accurate responses are recorded.

You will not be paid for your participation in this study.

Risks of Being in the Study

There are minimal risks to participating in this study. You may find that some questions may be difficult to answer. The risks of participation are similar to discussions during an educational meeting about your student. You can skip any questions you don't want to answer, and you can stop the interview at any time. You can end participation in this study at any time without any repercussion to you. The researcher, Angela Palazini, is an educator within this school district. The information gathered is to complete Angela Palazini's dissertation research.

Benefits to You

There are no direct benefits to you for participating in this study.

Voluntary Participation

Your participation is completely voluntary. It is not required by the school district, or the school. You can choose not to participate in this research, and it will not affect your employment. If you choose not to participate in this study, it will not affect your professional relationship with the researcher. Also, you can change your mind about participating at any time with no negative consequences.

Confidentiality

Because this is a research study, results will be summarized across all participants and shared in reports that we publish and presentations that we give. Your name will not be used in any reports. Several steps will be taken to protect your information so that you cannot be identified. Instead of using your name, a pseudonym will be used. The records of this research will be kept private. In any sort of report that might be published, the researcher will not include any information that will make it possible to identify you. Research records will be kept in a secured file on a password protected computer within a password protected file and seen only by myself and other researchers who work with me. The only time I would have to share information from the study is if it is subpoenaed by a court. If there are problems with the study, the research records may be viewed by the Rhode Island College review board responsible for protecting human participants and other government agencies that protect human participants in research. All data will be kept for a minimum of three years, after which it will be destroyed.

Contacts and Questions

The researcher conducting this study is Angela Palazini. You may ask any questions you have now. If you have any questions later, you may contact her at

apalazini_1954@email.ric.edu. You may also contact Dr. Paul LaCava with any questions or concerns at placava@ric.edu.

If you think you were treated unfairly or would like to talk to someone other than the researcher about your rights or safety as a research participant, please contact Dr. Emily Cook, Chair of the Rhode Island College Institutional Review Board at IRB@ric.edu or via phone at 401-456-8672.

You will be given a copy of this form for your records.

Statement of Consent

I have read and understand the information above, and I agree to participate in the study “Augmentative and Alternative Communication Systems for Students with Disabilities.” I understand that my participation is voluntary and can be withdrawn at any time with no negative consequences. I have received answers to the questions I asked, or I will contact the researcher with any future questions that arise. I am at least 18 years of age.

I ☐ agree ☐ do not agree to be interviewed for this study.

I ☐ agree ☐ do not agree to be audiotaped for this study.

Print Name of Participant: _____

Signature of Participant: _____ Date: _____

Name of Researcher Obtaining Consent: _____

Appendix E
Teacher Consent Form
TEACHER CONSENT DOCUMENT
Rhode Island College

Augmentative and Alternative Communication Systems for Students with Disabilities

You are being asked to be in a research study about augmentative and alternative communication use with children who have a disability. You are being asked because you have a student who requires the use of an augmentative and alternative communication system. Please read this form and ask any questions that you have before choosing whether to be in the study.

Angela Palazini, doctoral candidate at Rhode Island College, is conducting this study.

Paul LaCava, an Associate Professor at Rhode Island College, is overseeing this study.

Background Information

Many research studies are documenting the importance of augmentative and alternative communication systems for students with disabilities. Many studies research the opinions of parents or special educators, but very few studies examine the insights of all individuals involved in the training and use of the augmentative and alternative communication system.

The purpose of this research is to understand how parents, special educators, speech and language pathologist, and students describe the many facets of augmentative and alternative communication systems.

Procedures

If you choose to be a participant in this research, you will be asked to do the following things:

- **Identify students** on your caseload for potential participation in this research.
- **Contact parents/guardians** to inform them of key aspects of the research and provide them with consent documentation.
- **Allow access to your classroom**, during an academic time, for a 1 hour observation of students who have documented parental consent. The observation will focus on the student using their augmentative and alternative communication system.

- **Meet with Angela Palazini**, researcher, and who will be asking questions about your student's use of their augmentative and alternative communication system. The length of this interview will be 1 hour. You will be given the option to have your interview audiotaped to ensure accurate responses are recorded.

You will not be paid for your participation in this study.

Risks of Being in the Study

There are minimal risks to participating in this study. You may find that some questions may be difficult to answer. The risks of participation are similar to discussions during an educational meeting about your student. You can skip any questions you don't want to answer, and you can stop the interview at any time.

Benefits to You

There are no direct benefits to you for participating in this study.

Voluntary Participation

Your participation is completely voluntary. It is not required by the school district, or the school. You can choose not to participate in this research, and it will not affect your employment. If you choose not to participate in this study, it will not affect your professional relationship with the researcher. Also, you can change your mind about participating at any time with no negative consequences.

Confidentiality

Because this is a research study, results will be summarized across all participants and shared in reports that we publish and presentations that we give. Your name will not be used in any reports. Several steps will be taken to protect your information so that you cannot be identified. Instead of using your name, a pseudonym will be used. The records of this research will be kept private. In any sort of report that might be published, the researcher will not include any information that will make it possible to identify you. Research records will be kept in a secured file on a password protected computer within a password protected file, and seen only by myself and other researchers who work with me. The only time I would have to share information from the study is if it is subpoenaed by a court. If there are problems with the study, the research records may be viewed by Rhode Island College review board responsible for protecting human participants and other government agencies that protect human participants in research. All data will be kept for a minimum of three years, after which it will be destroyed.

Contacts and Questions

The researcher conducting this study is Angela Palazini. You may ask any questions you have now. If you have any questions later, you may contact her at apalazini_1954@email.ric.edu. You may also contact Dr. Paul LaCava with any questions or concerns at placava@ric.edu.

If you think you were treated unfairly or would like to talk to someone other than the researcher about your rights or safety as a research participant, please contact Dr. Cindy Padula, Chair of the Rhode Island College Institutional Review Board at IRB@ric.edu or by writing to Dr. Cindy Padula, Chair IRB; c/o School of Nursing, Rhode Island College; 600 Mount Pleasant Avenue; Providence, RI 02908.

You will be given a copy of this form for your records.

Statement of Consent

I have read and understand the information above, and I agree to participate in the study “Augmentative and Alternative Communication Systems for Students with Disabilities.” I understand that my participation is voluntary and can be withdrawn at any time with no negative consequences. I have received answers to the questions I asked, or I will contact the researcher with any future questions that arise. I am at least 18 years of age.

I ☐ agree ☐ do not agree to be interviewed for this study.

I ☐ agree ☐ do not agree to be audiotaped for this study.

Print Name of Participant: _____

Signature of Participant: _____ Date: _____

Name of Researcher Obtaining Consent: _____

Appendix F
Parent Consent Form
PARENT CONSENT DOCUMENT
Rhode Island College

Augmentative and Alternative Communication Systems for Students with Disabilities

You are being asked to be in a research study about augmentative and alternative communication use with children who have a disability. You are being asked because you have a son or daughter who requires the use of an augmentative and alternative communication system. Please read this form and ask any questions that you have before choosing whether to be in the study.

Angela Palazini, a doctoral candidate at Rhode Island College, is conducting this study.

Paul LaCava, an Associate Professor at Rhode Island College, is the principal investigator for this study.

Background Information

Many studies look how AAC systems can make a difference for people with disabilities. These studies look at information given by parents or special education teachers. Few studies look at all the people who teach others how to use AAC systems. Few studies look at the students who use AAC systems.

The reason for this study is to understand how parents, special education teachers, speech therapists, and students describe their knowledge with AAC systems.

Procedures

If you choose to be a participant in this research, you will be asked to do the following things:

- **Provide permission** for the researcher to access your child's speech and language evaluations, Student, Environment, Tasks, Tools (SETT) Framework, and your child's Individualized Education Program (IEP). The most recent speech and language evaluation is requested as well as the two previous evaluations if available. The most current IEP is requested as well as the two previous IEPs if available.

- **Meet with Angela Palazini**, to provide information about your child and his/her augmentative and alternative communication system. The length of this interview will be 1 hour. As the parent you will be given the option to have your interview audiotaped to ensure accurate responses are recorded.
- **Provide permission for an observation** of your child using his/her augmentative and alternative communication system. This one hour observation will be at a time identified by your child's teacher.
- **Provide permission to interview your child** about their augmentative and alternative communication system. The length of the interview will be no longer than 30 minutes and completed during a non-academic time. If you allow, the interview will be audio-recorded to ensure accurate responses are recorded. If your child does not use an augmentative and alternative communication system that has a voice output option, then your permission to video record the interview will be requested. The video recording will be captured in a way to avoid video capturing other students not in the study.
- **Participate in follow-up phone call** to answer any follow-up and/or clarifying questions.

You will not be paid for your participation in this study.

Risks of Being in the Study

There are minimal risks to participating in this study. You may find that some questions may be difficult to answer. The risks of participation are similar to discussions with family or during an educational meeting about your child. You can skip any questions you don't want to answer, and you can stop the interview at any time. You can end participation in this study at any time without any repercussion to you or your child.

The researcher, Angela Palazini, is an educator within this school district. The information gathered is to complete Angela Palazini's dissertation research.

Benefits to You

There are no direct benefits to you for participating in this study.

Voluntary Participation

Your participation is completely voluntary. Nobody can force you or your child to be in this study. The decision is up to you and your child. Your child will be asked separately whether he or she wants to participate, and his/her wishes will be followed. It is not required by the school district, school, or any service providers. You can choose not to participate in this research, and it will not affect your child's services. Also, you can change your mind about participating at any time with no negative consequences.

Confidentiality

Because this is a research study, results will be summarized across all participants and shared in reports that we publish and presentations that we give. Neither you nor your child's name will be used in any reports. Several steps will be taken to protect you and your child's information so that neither of you can be identified. Instead of using you or your child's name, a pseudonym will be used. The records of this research will be kept private. In any sort of report that might be published, the researcher will not include any information that will make it possible to identify you or your child.

Research records will be kept in a secured file on a password protected computer within a password protected file, and seen only by myself and other researchers who work with me. The only time I would have to share information from the study is if it is subpoenaed by a court, or if we think your child is being harmed by others then I would have to report it to the appropriate authorities. If there are problems with the study, the research records may be viewed by the Rhode Island College review board responsible for protecting human participants and other government agencies that protect human participants in research. All data will be kept for a minimum of three years, after which it will be destroyed.

Contacts and Questions

The researcher conducting this study is Angela Palazini. You may ask any questions you have now. If you have any questions later, you may contact her at apalazini_1954@email.ric.edu. You may also contact Dr. Paul LaCava with any questions or concerns at placava@ric.edu.

If you think you were treated unfairly or would like to talk to someone other than the researcher about your rights or safety as a research participant, please contact Dr. Cindy Padula, Chair of the Rhode Island College Institutional Review Board at IRB@ric.edu or by writing to Dr. Cindy Padula, Chair IRB; c/o School of Nursing, Rhode Island College; 600 Mount Pleasant Avenue; Providence, RI 02908.

You will be given a copy of this form for your records.

Statement of Consent

I read and understand the information above, and I agree to participate in the study "Augmentative and Alternative Communication Systems for Students with Disabilities." By signing below I/we are stating that I/we understand the information and give permission for my/our child to be in this study. Both parents/guardian must give their permission unless one parent is deceased, unknown, incompetent, or not reasonably available, or when only one parent has legal responsibility for the care and custody of the child. I understand that my participation is voluntary and can be withdrawn at any time with no negative consequences. I have received answers to the questions I asked, or I will contact the researcher with any future questions that arise. I am at least 18 years of age.

Consent for Child Participation in this study

Child's name _____

_____ I give consent for my child to participate in this study.

I ___ Do ___ Do Not give consent for my child to be observed for this study.

I ___ Do ___ Do Not give consent for my child's interview to be audiotaped for this study.

I ___ Do ___ Do Not give consent for my child's interview to be videotaped for this study.

Consent for Parent Participation in this study

_____ I give consent as parent/guardian to participate in this study.

I ___ Do ___ Do Not give consent for my interview to be audiotaped for this study.

I ___ Do ___ Do Not give consent to be contacted by phone.

Print Name of Participant: _____

Signature of Participant: _____ Date: _____

Print Name of Participant: _____

Signature of Participant: _____ Date: _____

Name of Researcher Obtaining Consent: _____

Appendix G

Child Assent Form

Child Assent Form

Augmentative and Alternative Communication Systems for Students with Disabilities

You must read this or have someone read to you.

Please read this whole form.

You can choose to be in this study

You can choose to NOT do this study.

Ask any questions before deciding to be in the study.

My name is Angela Palazini and I am doing a study
about how students use communication systems.

What is a study?

A study helps people learn new things.

This study asks questions

The questions are about your communication system

If you choose to be in the study then you will spend 30

minutes answering questions. Angela will watch you for 1 hour using

your communication system.

Name of researcher obtaining assent: _____

Appendix H

Interview Questions for AAC Coordinator

1. How many years have you been working with individuals with complex communication needs?
2. Can you explain how much and what kind of training you have had in regards to AAC?
3. Can you discuss in your experience the ideal function of AAC systems?
4. Can you explain which type of AAC you are most comfortable with and why?
5. When you are determining an AAC system for a student, how many options are typically tried?
6. How do you incorporate educators and families in the decision making process?
7. How do you ensure the proper use of the AAC system by all teachers, teacher assistants, Speech & Language Pathologist, and families?
8. Can you discuss your approach when training parents and educators to use the AAC system?
9. How and where is this training completed?
10. Is it one training session or are there multiple sessions? Can you explain if there is any follow-up after the training?
11. Can you discuss your likes and/or dislikes regarding AAC?
12. How do you try to include families that are hesitant?
13. How do you determine if an AAC system is effective?

14. If minimal success is made how and when do you determine if the AAC system needs to be reconsidered?
15. How often have you had to reconsider an AAC system for a student? How did it come about?
16. How often do you reassess a current AAC system with the team to discuss its effectiveness?
17. How do you incorporate/involve service providers from other disciplines as it relates to AAC?
18. Can you explain how you determine the vocabulary to be added to an AAC system and when you add new vocabulary?
19. What is the district policy regarding the attainment and use of an AAC system?
20. Is there anything else you would like to tell me about the current process regarding the obtaining and training of AAC systems?

Appendix I

Interview Questions for Special Educators and Speech - Language

Pathologists

1. How many years have you been working with individuals with complex communication needs?
2. Can you explain how much and what kind of training you have had in regards to AAC?
3. Can you explain which type of AAC you are most comfortable with and why?
4. How do you incorporate the use of AAC into your lessons and your classroom?
5. Can you discuss in your experience the ideal function of AAC systems?
6. How do you ensure the proper use of the AAC system by all teachers and teacher assistants?
7. Who is responsible for training parents to use the AAC system?
8. How and where is this training completed?
9. Is it one training session or are there multiple sessions?
10. How was the adjustment period when this student first received their AAC system?
11. What was it like?
12. Can you discuss your likes and/or dislikes regarding AAC?
13. Are families included in the decision making process?
14. How do you incorporate the families?
15. How do you try to include families that are hesitant?
16. How do you determine if an AAC system is effective?

17. If minimal success is made how and when do you determine if the AAC system needs to be reconsidered?
18. Can you explain how you determine the vocabulary to be added to an AAC system and when you add new vocabulary?
19. Please explain your likes and dislikes of the AAC system your student is currently using?
20. Can you explain the level of effectiveness your student has with their current AAC system? How do you determine effectiveness?
21. Is there anything else you would like to tell me about your student and their AAC system?

Appendix J

Interview Questions for Parents/Guardians

1. Can you describe your child to me?
2. How do you think the community sees your child when using their AAC system?
3. How do you communicate most effectively with your child?
4. How do extended family members communicate with your child?
5. How did your child communicate before they acquired their AAC system?
6. Can you describe the training you received, if any, regarding your child's AAC system?
7. How has the current AAC system affected your child's ability to communicate?
8. Can you explain how your child uses their AAC system and where they use it most?
9. When the IEP team decided on an AAC system, explain the decision making process from your perspective.
10. How was a system chosen?
11. Were there any trials?
12. Would symbols be used?
13. If so which ones?
14. How do you describe the ideal use of the AAC system for your child?
15. Can you explain your likes and dislikes regarding the AAC system?
16. How have you seen your child's communication abilities change or do you not see a change? Please explain.

17. Do you feel the AAC system currently being used is effective why or why not?
18. How do you think your child feels about the AAC system?
19. Why do you feel that way?
20. How do you see the AAC system impacting your child's quality of life as they
get older?
21. Is there anything else you would like to tell me about your child and their AAC
system?

Appendix K

Student Questions

1. Do you like _____ (AAC system name)?
2. What do you like and/or dislike about _____ (AAC system name)?
3. Did you try more than one AAC system?
4. Which system do you like best?
5. Did you get to choose which AAC system you liked?
6. Who helped you choose (or who chose) your AAC system?
7. Do you find _____ (AAC system name) easy to use?
8. Are you able to create your messages easily?
9. What types of messages do you use your AAC system to communicate?
10. Do you use your system at home?
11. Where do you use your AAC system?
12. Do you ever use your AAC system in the community?
13. Has anyone ever had difficulty understanding your message?
14. Is there anything you find frustrating about your AAC system?
15. Has there ever been a time when you have something you want to say but the word(s) is not there?
16. Who do you communicate with the most using your AAC system?

Appendix L

Student Observation Guide

Who is communication with?									
Peer									
Adult									
Production of message									
Aided									
Unaided									
Type of comment									
Request									
Comment									
Question									
Length of message									
Was the message acknowledged									
Yes									
No									

Comments:

Appendix M

Codebook

CODE	BRIEF DEFINITION	DEFINITION	WHEN TO USE	WHEN NOT TO USE
Exper	level of <u>experience</u>	Amount of years working with students with CCN	Use when participants speak about how many years they have worked with students with CCN	When discussing training
Train	amount of <u>training</u>	Type and amount of time learning to use AAC system	Amount of formal or informal training an individual received when using AAC	When discussing years of experience
Strat	<u>teaching strategies</u>	Ways in which teachers teach students and/adults to use AAC system	When educators talk about how they teach students to use AAC	When participants discuss how students use their AAC system
ELL	<u>English Language Learner</u>	When student and/or their families' primary language is not English	Used when teachers/families discuss the issue of student being an ELL learner	Do not use when discussing a lack of comprehension and/or lack of understanding to the purpose of communication
PA	<u>phonemic awareness</u> - letter sounds	Subset of phonological awareness in which a listener hears, identify, and	When students are able to spell the vocabulary they are looking for	When students use picture/graphic symbols to locate vocabulary
CO	<u>carry over</u> in multiple settings	Use of AAC strategies in multiple settings	Use of AAC system in a variety of settings in which the student communicates	When the student only uses the AAC system at school
Function	<u>function</u> of AAC	Reason a person uses AAC system	When participants discuss how they feel the AAC system should be used	When participants discuss how they would like the system to be used in the future.
Accept	<u>acceptance</u> of AAC use	Other individuals accepting AAC as student's mode of communication	When participants discuss the interest of others in the AAC system as well as students own willingness to use the AAC system for communication	When participants discuss how the student uses their AAC system
Use	<u>Use</u> of AAC	Amount of time student uses AAC system	How well the student is able to communicate their messages using AAC	Do not use when discussing how the student is using the AAC system
DL	What a individual <u>dislikes</u> about AAC	What individuals dislike about AAC system	When participants discuss what they do not like about the AAC system they are using or have used	When discussing barriers to using AAC system
Likes	What a individual <u>likes</u> about AAC	What an individual finds pleasing or helpful about AAC system	When participants discuss what they like about current or past AAC systems	When discussing which AAC system they prefer
BI	<u>Buy in</u> to use the AAC	Everyone who interacts with student & their AAC system uses it & accepts it	Used when participants discuss the individuals who use AAC system with student and their own use of AAC with student	When discussing what participants like about AAC system
DM	<u>decisions</u> about AAC	How teams decide on appropriate AAC system	Process used by the team to chooses AAC system. Discussion of trials	When participants discuss the lack of choice provided
Eff	<u>Effectiveness</u> of AAC	How well a student can communicate their message using AAC system	Data used to determine success of student. When participants discuss how they determine if AAC system is appropriate for student	When discussing how the student uses their AAC device. When discussing if they use words or graphics when locating vocabulary
Vocab	<u>Vocabulary</u> used in AAC	Words used/added to AAC system	When discussing the words added to the AAC system for the student to access	When discussing if the student types or uses graphics to express message
LoP	<u>minimal progress</u>	Student's inability to use AAC system effectively	When discussing the students lack of use of AAC system. When discussing students level of progress	When discussing a transfer from one system to another. When discussing student use when system is new to them.
Barrier	<u>Barrier</u> to using AAC	Obstacle for using AAC system	Used when discussing reasons when AAC systems are unavailable for student use due to technology or human reasons	When discussing what participants dislike about AAC system.
Expect	<u>Expectation</u> of use	Ways in which teachers/SLPs anticipate student AAC use	When discussing how teachers/parents want AAC to be used to assist with communication	Do not use when discussing how student is using system now. Or how a participant thought the system would work.
FH	<u>Future hope</u> of AAC	Ways in which parents/teacher hope for AAC use	When discussing the anticipated goals of AAC system use.	When discussing how the teachers/parents want AAC to be used for the student
LoC	<u>Lack of Choice</u>	Lack of options for AAC system	When there is only one option for parents to choose. No other AAC systems are discussed.	When discussing how teams chose AAC system and the discussion of trials
Col	<u>Collabotation</u> with colleagues/families	Working with colleagues on what is best for student who uses AAC	When participants discuss working with other service providers	When discussing strategies
Cho	<u>Choice</u> of AAC system	Student/Parent expresses that they had a choice in which system they felt was appropriate	Use when a choice was provided to student and/or parent about the AAC system to be utilized to communicate	Do not use when discussing decision making
Main	<u>Maintenance</u>	Repairs to AAC systems beyond simple solutions such as charging	Used when participants discuss how AAC systems are repaired and/or who is responsible for repairs	Do not use when discussing barriers
Tool	<u>Tool</u>	When parents and/or educators refer to AAC system as a tool vs a mode of communication	Used when participants discuss how they view the AAC system	Do not use when describing the AAC system itself
PS	<u>Progression of Systems</u>	When parents or educators discuss student use of a low-tech to a high-tech system		

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