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# Supporting the Communication Needs of Students with Severe Disabilities in Inclusive Settings: Practices and Perspectives

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**Supporting the Communication Needs of Students with Severe Disabilities in  
Inclusive Settings: Practices and Perspectives**

by

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## Chapter 1: Introduction

Many individuals with serious developmental disabilities experience significant difficulty in communicating effectively (Hourcade, Everhart Pilotte, West, & Parette, 2004). They are not effectively able to express their thoughts, needs, or desires. Fortunately, over the past several decades, this has changed through the use of augmentative and alternative communication (AAC) (Sevcik & Rowski, 2015).

According to the American Speech-Language and Hearing Association (ASHA, 2015), an Augmentative and Alternative Communication (AAC) system includes four components: symbols, aids, techniques, and/or strategies. “AAC incorporates the individual's full communication abilities and may include any existing speech or vocalizations, gestures, manual signs, and aided communication” (ASHA, 2015). There are two primary types of AAC systems: aided and unaided (ASHA, 2015; Hourcade et al., 2004).

Unaided communication systems rely upon the user's body to communicate and share information and include sign language, body language, and gestures. Aided communication systems also rely upon the user's body, but in addition require the use of tools or equipment. Aided systems can range from low technology to high technology and include paper and pencil, picture images, communication notebooks, and keyboards. They also include voice output communication aids (VOCAs), which are also referred to as speech-generating devices (SGDs) (ASHA, 2015; Chung, Carter, & Sisco, 2012; Hourcade et al., 2004; Mutua, Snider, & Bakken, 2010). There are both static and dynamic voice output devices. With a static device, a user accesses a button or series of buttons on the face of the screen to activate a spoken message. . With a dynamic touch screen device, the user can access specific locations on the screen that

change the screen that is being presented to the user based on what topic folder is opened on the device (Beck, Thompson, Kosuwan, & Prochnow, 2010). SGDs have improved throughout the years as technology continues to advance (Shane, Blackstone, Vanderheiden, Williams, & DeRuyter, 2012).

For many individuals with severe disabilities, AAC is the primary option they have to express their needs and communicate with others (Calculator & Black, 2009; Downing, 2005). The purpose of this paper was to review the research literature that examines outcomes related to the use of AAC in inclusive classrooms. In addition, this paper evaluates the attitudes of general education teachers and peers toward the use of AAC devices in the general education setting.

### **Overview of Intellectual Disabilities**

According to the Individuals with Disabilities Education Improvement Act of 2004 (IDEA; Wright, 2010), an intellectual disability is defined as “significantly sub-average general intellectual functioning, existing concurrently [at the same time] with deficits in adaptive behavior and manifested during the developmental period, that adversely affects a child’s educational performance” (Public Law § 300.8; Wright, 2010). The term *mental retardation* was used to refer to the category of intellectual disabilities since the passage of the Education of All Handicapped Children Act of 1975 (PL 94-142) and until 2010, when President Obama signed Rosa’s Law. This law changed the term to *intellectual disability*. As a result of this law, all legislation was amended to substitute this term (Wright, 2010).

Intellectual disabilities are diagnosed by two eligibility criteria: the ability of a person to learn, think, solve problems, and make sense of the world (intellectual functioning/IQ), and the skills a person possesses to function independently (called adaptive behavior or adapted

functioning) (Hallahan & Kauffman, 2002; Minnesota Department of Education [MDE], 2011).

In the Minnesota, the term *Developmental Cognitive Disability* (DCD) is used to identify students with intellectual disabilities who are eligible for special education services. Minnesota defines two DCD categories: mild-moderate and severe-profound. Students with mild-moderate intellectual disabilities have an IQ of two standard deviations below the mean, whereas students with severe-profound intellectual disabilities score three or more standard deviations below the mean (MDE, 2011).

### **Policy and Legislation**

From medieval times to the mid-20<sup>th</sup> century, children with disabilities were viewed as a family tragedy. They were typically excluded from school and placed in institutions (Hallahan & Kauffman, 2002; Mutua et al., 2010). It was not until the 1950s that advocacy organizations such as the National Association of Retarded Children (now known as ARC of the United States) rallied to build support, create advocacy for access to services, and validate practices for individuals with disabilities (Hallahan & Kauffman, 2002).

In addition to the advocacy efforts of several organizations and agencies, federal legislation was pivotal in changing the views of individuals with disabilities and their rights to services. Two Supreme Court decisions applied the equal protection argument to students with disabilities: the 1972 *PARC v. Pennsylvania* case and the 1972 *Mills v. D.C. Board of Education* case. The *PARC* case dealt with the exclusion of children with disabilities from public schools. The court ruled that children with disabilities were entitled to receive a free and appropriate public education (Ashbaker, 2011). In *Mills v. D.C. Board*, the court reasoned that because the children would have been entitled to attend free public schools, each child had a right to such an



education. The court explained that the school board's failure to meet its mandate could not be excused by its argument that there were insufficient funds available to pay for the services that the children needed. Children's rights to education could not be removed without due process of law (Ashbaker, 2011; Wright 2010).

In response to over 36 lawsuits in 27 states affirming an education for children with disabilities, Congress passed PL 94-142 (Ashbaker, 2011). This law guaranteed free and appropriate public education in the least restrictive setting for all children with disabilities from school age through age 21 (ASHA, 2015; Hallahan & Kauffman, 2002; MDE, 2011). Although the law did not directly address AAC, it did ensure that each child with a disability has an Individualized Education Plan (IEP) that specifies the supports the student needs to reach his/her goals (Ashbaker, 2011; Hallahan & Kauffman, 2002; Hourcade et al., 2004; Kurth, Morningstar, & Kozleski, 2014). It was amended in 1986 to provide technological services for school-age children with disabilities.

The Technology-Related Assistance for Individuals with Disabilities Act of 1988 (PL 100-407) required states to make every reasonable attempt to provide assistive technology—including AAC—to all citizens with disabilities, regardless of age, disability, or location of residence. PL 100-407 defined AT 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 individuals with disabilities” (Mutua et al., 2010, p. 106).

The 1990 and 1997 reauthorizations of PL 94-142 as the Individuals with Disabilities Education Act (IDEA) also placed additional focus on the role of AT. Specifically, three areas

were targeted: AT assessment, AAC, and IEP consideration and documentation (Ashbaker, 2011; Mutua et al., 2010). The IDEA 2004 legislation required the IEP team to consider inclusion and placement in the general education classroom as the starting point in determining the appropriate placement for the child (Ashbaker, 2011; Obiakor, Harris, Mutua, Rotatori, & Algozzine, 2012). If the IEP team determines that the least restrictive environment appropriate for a particular child is not the general education classroom, the IEP team must include an explanation in the IEP as to why the general education classroom is not appropriate (Ashbaker, 2011; Obiakor et al., 2012). Students can be removed from general education environment “only if they cannot be satisfactorily educated with the use of supplementary aides and services” (Obiakor et al., 2012, p. 479).

The purpose of these requirements is to comply with the intent of IDEA legislation, which is to educate as many students with disabilities as possible in the general education classroom while still meeting their unique and individual needs (Obiakor et al., 2012). Because students with disabilities are more likely to succeed in general education settings when they have the AT tools they need, IEP teams must consider the AT needs of all children with disabilities (Wright, 2010).

### **The SETT Framework**

Zabala (2005) created the SETT framework as a means of systematically evaluating students’ unique needs and abilities in order to determine which AT device(s) is most beneficial. The SETT Framework is a four-part model that is intended to promote collaborative decision making in all phases of AT service design and delivery. SETT is an acronym for Student, Environments, Tasks, and Tools.

*Student.* The IEP team addresses four main questions specifically related to the student: “What is the functional area(s) of concern? What does the student need to be able to do that is difficult or impossible to do independently at this time? What are the student’s special needs that contribute to these concerns? What are the student’s interests?” (Zabala, 2005, p. 2).

*Environment.* The IEP team must consider all environments in which the student participates, including information related to anything or anyone around the student in places where technology will be used. The team must consider physical arrangement, instructional arrangement, available materials, supports, and resources available to the team to support students, including the attitudes and expectations of staff and parents working with the student (Zabala, 2005).

*Tasks.* The IEP team must consider what actually happens in the environments with regard to each individual student, including activities that take place that will enable them to achieve educational goals and be active participants in the daily life surrounding them (Zabala, 2005).

*Tools.* The IEP team must consider tools, including devices, services, and strategies to help the student succeed. These can range from no tech to very high tech devices and supports (Zabala, 2005). This involves asking the question: “What needs to be included when developing a system of assistive technology tools for a student with these needs and abilities, doing these tasks in these environments?” (Zabala, 2010, p. 2).

Zabala (2005) emphasized that these components are not intended to imply a specific order, but rather to ensure that the student, environments, and tasks should be fully explored before tools are considered or selected. Some professionals have tried to explore the first three

separately, but this nearly impossible because the first three are closely interrelated. Zabala also emphasized collaboration, communication, and multiple perspectives as part of the planning process (Zabala, 2010).

Students with severe intellectual disabilities often have significant communication needs that present many challenges to teachers and speech-language pathologists who attempt to provide them with an appropriate education in the least restrictive environment (Kent-Walsh & Light, 2003; Soto, Müller, Hunt, & Goetz, 2001). AAC facilitates the successful inclusion of all students—even those with the most severe and profound disabilities—by helping to give them a voice (Calculator, 2009).

### **Implications for Inclusion**

A number of students with complex communication needs are being included in general education settings on a full- or part-time basis (Downing, 2005; Kent-Walsh & Light, 2003; Soto et al., 2001). The term *full inclusion* refers to the concept that all students, regardless of types or severities severity of disability, attend classes only in general education. Proponents of full inclusion do not support the creation of separate special education classes. They believe that all students with disabilities should attend their neighborhood schools and that general education should assume primary responsibility for instruction (Hallahan & Kauffman, 2002). This is a concept that some perceive to be in violation of IDEIA's stipulation that a student's placement must be chosen from a continuum of alternative placements (Hallahan & Kauffman, 2002).

Partial inclusion, often referred to as regular inclusion, is based upon individualization of inclusion according to each student's needs. It often involves the use of accommodations and modifications in order for the inclusion experience to be meaningful to the student with the

disability by providing opportunities for students to interact and participate with their mainstream peers (Downing, 2005). The special education teacher and general education teacher often co-teach or teach cooperatively to deliver instruction. A number of co-teaching models have been developed to provide instructional support for students with disabilities (Hallahan & Kauffman, 2002).

The successful inclusion of students who utilize AAC in general education is not possible without a team approach that is supportive of inclusion (Downing, 2005; Kramlich, 2012). Students with AAC devices need extensive support to in order to be successful, and all team members must play an active role. In order for inclusion to be meaningful, the speech-language pathologist, special education teacher, general education teacher, parent, paraprofessional, and other relevant personnel must work together (Downing, 2005, Finke, McNaughton, & Drager, 2009; Kent-Walsh & Light, 2003, Soto et al., 2001). Team members must be highly skilled in adapting curriculum, identifying and providing meaningful learning opportunities, and facilitating interactions between peers (Finke et al., 2009; Kent-Walsh & Light, 2003; Soto et al., 2001).

Benefits of inclusion for AAC users include increased access to the general education core curriculum, increased social participation, friendship, and communication with peers, more appropriate behavior, and higher academic expectations (Downing, 2005; Kent-Walsh & Light, 2003; Soto et al., 2001). However, inclusion also benefits non-disabled peers. Kent-Walsh and Light (2003) and Soto et al. (2001) found that classmates were more aware and accepting of students with special needs, viewing them as more capable and “normal.” Students without disabilities provide appropriate role models for their peers with disabilities and can become

responsive to their communication efforts (Soto et al., 2001). Although more supports (e.g., AAC) are currently available that enable students to participate in general education settings alongside their non-disabled peers, the inclusion of students with severe disabilities is not without controversy (Fisher & Meyer, 2002). Challenges include limited resources, time challenges, instructional styles, modification of curricular materials, and negative attitudes and perceptions toward students with disabilities (Calculator, 2009; Downing, 2005; Kramlich, 2012). Opponents of inclusion have voiced concerns that children with severe disabilities are better served in self-contained environments and that inclusion negatively affects general education students. Some research also suggests some general educators view inclusion as unfeasible or undesirable due to student disruptions and the need for increased lesson planning (Fisher & Meyer, 2002). This research will be examined in Chapter 2.

### **Research Questions**

Two related research questions guide this review of literature:

1. What outcomes are reported when students with severe disabilities use AAC devices in inclusive settings?
2. How do teachers and peers perceive the use of AAC devices in inclusive educational settings?

### **Focus of the Review**

At this time, I have located 13 qualitative and quantitative studies relating to students in grades K-12 with severe cognitive, intellectual, and physical disabilities. Studies were published from 2000-2015 in English-speaking countries. The research studies and articles shared in this paper discuss the impact of students that utilize AAC devices to communicate with regard to best

practices toward inclusion and peer interaction in the classroom, as well as the attitudes of general education teachers and classmates toward them.

Academic Search Premier, PsycINFO, and Proquest were used to locate studies using a variety of keywords and keyword combinations: *developmental disabilities, intellectual disabilities, communication, augmentative and alternative communication, AAC, general education teachers, attitudes, perceptions, peers, and inclusion*. In addition, I explored the tables of contents of two journals for the past 5 years: *Augmentative and Alternative Communication* and *Perspectives on Augmentative and Alternative Communication*.

### **Importance of the Topic**

As a special education teacher of students who have intellectual and cognitive disabilities, I work with a number of students who use AAC devices to communicate on a daily basis. Unfortunately, in my teaching experiences I have discovered that having an AAC device is frequently as much of a barrier as it is a support to their inclusion because general education teachers and peers are unfamiliar with how the devices work and/or they are uncertain how to interact with students who use them.

AAC devices are continuing to evolve and revolutionize communication possibilities for individuals who are nonverbal. As a result of this paper, I hope to identify current barriers to inclusion as well as existing attitudes towards individuals with AAC devices. I also hope to learn different strategies to help with the successful implementation of inclusion in the general education setting for students with AAC devices. I want to ensure that not only my students, but also all students who use AAC devices are provided an education in the least restrictive environment.

## Definitions

Critical terms are defined in this section. Additional terminology and definitions for this section will be added as Chapter 2 is developed.

*DeltaTalker.* An older style of a Prentke Romich portable communication device that generates speech output (Prentke Romich Company, 2015).

*DynaMyte.* A dedicated voice output communication system with a dynamic display and synthesizes speech manufactured by DynaVox (Sonnenmeier, McSheehan, & Jorgensen, 2005).

*Go Talk.* A dedicated voice output communication system manufactured by Attainment with four levels of 9-item displays (Sonnenmeier et al., 2005).

*Individualized Education Plan (IEP).* Mandated written document drawn up by collaborative educational team that details students' strengths and needs in any area affected by disability. The IEP must include a statement of present educational performance, instructional goals, educational services to be provided, and criteria and procedures for determining that the instructional objectives are being met and be updated annually (Ashbaker, 2011).

*Interobserver Agreement (IOA).* A procedure for validating data that involves comparing independent observations from two or more people. It is calculated by taking the number of agreements between the independent observers and dividing it by the total number of agreements plus disagreements (Watkins & Pacheco, 2001).

*Least Restrictive Environment (LRE).* Environment where students with disabilities are satisfactorily educated together with children who are not disabled in the same school the child would attend if the child were not disabled. However the LRE must have meaningful educational benefit for each child with disabilities (Ashbaker, 2011).



*Occupational Therapist (OT)*. A specialist that helps individuals with disabilities participate in everyday activities in school and social situations (American Occupational Therapy Association, Inc., 2015).

*Picture Exchange Communication System (PECS)*. An augmentative/alternative communication intervention package for individuals that does not require complex materials. It utilizes a series of printed pictures in a communication book to indicate wants, needs, and other forms of communication (Picture Exchange Communication System, n.d.).

*Prentke Romich*. A company that specializes in technology and augmentative communication that utilizes the Unity Language. It uses a small set of easy-to-recognize pictures that can be combined to create and produce words, phrases, and sentences (Prentke Romich Company, 2015).

*Proloquo2go*. An English and Spanish symbol-supported communication application that promotes language development in beginning to advanced users (Proloquo2Go, 2015).

*Speech-Language Pathologist (SLP)*. A specialist that works to prevent, assess, and treat speech, language, social communication, and cognitive communication in children and adults (American Speech-Language-Hearing Association, 2015).

*Vantage Lite*. A portable Prentke Romich communication device that generates speech output using the Unity Language (Prentke Romich Company, 2015).

## **Chapter 2: Review of the Literature**

In this chapter, I review 13 studies reported over the last 15 years that examine augmentative and alternative communication (AAC) and its implications for inclusion in the classroom, including perspectives and attitudes toward AAC users. The first section of Chapter 2II presents findings regarding inclusion outcomes for students who utilize AAC in the general education classroom. The second section reviews studies that examine teacher and student attitudes toward students who utilize AAC. All summaries briefly describe study participants, procedures, data analyses, limitations, and conclusions.

### **Studies that Examine Inclusive Outcomes**

The six studies included in this section examine inclusion outcomes and opportunities for AAC users to meaningfully participate in the mainstream setting. Although students with disabilities who utilize AAC are enrolled in general education classes, they often remain socially isolated from their classmates. Interventions related to peer interaction and inclusion are also discussed in this section.

Hunt, Soto, Maier, Muller, and Goetz (2002) evaluated the effectiveness of using a team collaboration process to increase social participation and academic achievement of three students with AAC needs in the general education setting. Each student was part of an educational team that consisted of a general education teacher, inclusion support teacher, instructional assistant, speech-language pathologist (SLP), and one parent.

The study was conducted in the San Francisco Bay area at two elementary schools with diverse student populations. The three students with significant cognitive delays included Minh in fifth grade, Paolo in first grade, and Khamla in kindergarten. None of the general education

teachers involved on their teams had previously worked with students who had extensive AAC needs.

Hunt et al. (2002) developed Unified Plans of Support (UPS) for each of the three students. Ninety-min monthly meetings were held once monthly to develop and monitor the plans and included academic supports and modifications as well as communication supports to increase participation. Supports were developed specifically to decrease periods of non-engagement, increase attempts to initiate communication interactions, and increase overall interactions between the students and their classmates. A UPS form guided the discussion for the academic areas of math, reading, and also for participation in classroom activities, communication, and socialization. A grid indicated which member of the team was responsible and provided a rating scale to evaluate the extent the plan was implemented. Team members reviewed and revised plans monthly.

Hunt et al. (2002) designed the *Interaction and Engagement Scale* to measure interaction and engagement during 30-s partial interval observations. Each student was observed at least once weekly from September through March during a 2-hr session to record communication, interaction with others, function and level of engagement, use of an AAC device, and the grouping pattern. Interobserver reliability averaged 98% during observations. Following implementation of the academic and social supports over the 5-month study, interaction levels increased for all three participants. Table 1 provides more detailed information for each participant's interaction levels.

**Table 1****Percentage of Intervals Where Interaction Occurred**

STUDENT	BASELINE	INTERVENTION
Khamla	Interaction Levels: 5.2% One-on-one Interactions: 3.8% Initiated Interactions: 3.8%	Interaction Levels: 35.7% One-on-one Interactions: 21.4% Initiated Interactions: 14.7%
Paolo	Interaction Levels: 8.7% One-on-one Interactions: 6.1% Initiated Interactions: 5.7%	Interaction Levels: 37% One-on-one Interactions: 17.9% Initiated Interactions: 12.2%
Minh	Interaction Levels: 2% One-on-one Interactions: 1% Initiated Interactions: 0%	Interaction Levels: 26% One-on-one Interactions: 7.6% Initiated Interactions: 3.5%

Concurrent with these increases were corresponding decreases in classroom non-engagement. Minh's level of non-engagement decreased from occurring during 8.3% to 2.5% of intervals, 29% to 5.6% of intervals for Khamla, and 17% to 3.9% of intervals for Paolo.

Prior to this study, no AAC devices were used in any of the classrooms. After implementation of the plan, use of a device increased from a baseline of 0% for all three students to an average of being used during 9.2% of intervals for Minh, 5.3% of intervals for Khamla, and 3.5% of intervals for Paolo.

Interviews with team members were conducted three times throughout the study: 1 week before implementation, 1 month after implementation, and at the end of the study. Interviewees described positive behavioral changes, increased independence, more frequent interactions with peers, increased engagement in classroom activities, and increased proficiency using a variety of communication modes as a result of the UPS process. Seven themes emerged during the data analysis process:

1. Monthly meetings provided scheduled opportunities for updates and an opportunity to focus on specific needs.
2. The UPS process provided a support network for team members.
3. The process expanded team members' vision of inclusion in the general education setting.
4. The process allowed for development of a comprehensive plan.
5. The process was flexible.
6. The process provided a basis for development of academic and social objectives.
7. The process identified a structure that could be molded by individual teams to make it match a team's collaboration style and individual team members' levels of comfort in the collaborative process. and used for other students.

The results of this study indicated a collaborative teaming process was effective in increasing levels of engagement, participation, and academic levels. Such collaborative teaming requires planning time and financial resources, which are not always available.

Lilienfeld and Alant (2005) conducted a single-case study with a 15-year-old adolescent who utilized AAC to investigate the interaction with his classroom peers before, during, and after implementation of a peer-training program. Simon utilized a *DeltaTalker*, a speech-generating device (SGD). However, his preferred method of communication was speech, despite the fact it was unintelligible. Three of Simon's mainstream teachers agreed to be videotaped and interviewed so data were gathered during four subjects: English, drama, human social studies, and science.

From the videotapes, trained observers collected observational data using a 2-min interval recording procedure to indicate the frequency of interactions, extent of interchanges, communication functions, and modes of communication in the classroom. Eight 50-min school periods were taped during the intervention phase, and six 50-min school periods were taped during each of the pre-intervention, post-intervention, and maintenance phases measuring Simon's communication opportunities. Three different contexts for communication opportunities were identified and coded: teacher-directed time, outcome-based educational (OBE) small-group discussion, and informal time. In addition to analyzing videotapes for the total number of interactions between Simon and his peers, observers recorded whether he was the initiator or receiver. Communication responses include answers to yes/no questions, facial expression, body movement, eye gaze/eye pointing, vocalization, and responses given on a speech-generating device, the *Delta Talker*. In addition, the type of interaction was recorded (e.g., initiation, response, social greeting/norm, a request, a question, opinion).

Baseline data were gathered during the pre-intervention phase to measure Simon's communication opportunities prior to intervention. The intervention itself consisted of eight 50-min peer-training workshops. All of Simon's peers participated in these workshops surrounding his identified difficulties in the classroom and the desired interaction behaviors of peers. Activities reflected the difficulties Simon experienced while interacting with peers and included themes such as behaviors that block communication, conversation maintenance, feedback and clarification, and listening skills. All peers had opportunities to practice interacting with Simon during the workshops. Handouts and principles of social skills training were printed and presented to Simon's peers. The post-intervention phase was completed in the four 4 weeks

following the intervention to see if the peer training program had increased Simon's interactions and class participation. The observers then returned 7 weeks after the intervention to see if the increase in interactions had been maintained.

During the baseline phase, Simon had an average of 22 interactions in teacher-directed time, 84 interactions in OBE small-group discussions, and 55 interactions during informal time. During the intervention, Simon had an average of 25 interactions during teacher-directed time, 172 interactions during OBE small-group discussions, and 174 interactions during informal time. Post-intervention data included a mean of 58 interactions in teacher-directed time, 215 interactions during OBE small-group discussions, and 284 interactions during informal time. During the maintenance phase, Simon had a mean average of 105 interactions per hour in teacher-directed time, 301 interactions during OBE small-group discussions, and 307 interactions during informal time. These data indicated a substantial increase in the number of interactions and messages exchanged between Simon and his peer. Simon preferred to use natural speech as his primary mode of communication and only utilized the *DeltaTalker* within the small-group OBE context, with less than 10 uses per hour. Therefore, although interactions increased between Simon and his peers as a result of the intervention, it did not increase Simon's desire or preference to use his Delta Talker so that peers could better understand him.

A major limitation of this study was that it was a single descriptive case study. Therefore, results cannot be directly related to the intervention or generalized to other students with disabilities who utilize AAC.

Sonnenmeier et al. (2005) created and implemented the *Beyond Access* model, which is an integrated student and team support model to promote engagement and communication for

students with significant disabilities in the general education setting. The *Beyond Access* model process included four phases: assess student and team supports, explore and describe, observe and document, and review and reflect.

The case study was implemented with a 10-year-old student with autism named Jay, who had previously and inconsistently used the *Picture Exchange Communication System* (PECS) and *Go Talk*. Jay's educational team included his father, stepmother, classroom teacher, instructional assistant, SLP, occupational therapist (OT), special education teacher, and district AAC consultant. Observational case study methods were used to collect data including observations, interviews, and review of documents focusing on collaborative teaming, implementation of communication and instructional supports for inclusive education and AAC, and changes and improvement in Jay's communication and engagement within the general education curriculum.

Implementation of the *Beyond Access* model started with the completion of a Comprehensive Assessment of Student and Team Supports (CASTS) prior to intervention. It was used to implement practices and programming. The CASTS revealed all team members were concerned about the lack of planning meetings to address Jay's unique needs. The team established a weekly 45-min meeting time to discuss Jay's curricular, communication, and behavior support needs. The team rewrote IEP goals and embedded Jay's communication goals within the general education curriculum. Specifically, three areas were targeted: being engaged in social studies, science, math, and language arts lessons, selecting appropriate words from the spelling unit to complete sentences, and matching text to pictures of 50 words from the fifth-grade spelling units.



Prior to intervention, Jay was primarily a passive participant during classroom activities. To achieve his IEP goals, SLP services were increased to three times per week, special educator time in the classroom was increased, and increased opportunities were provided for consultation and collaboration with the instructional assistant from the SLP, OT, and special educator, and joint SLP and OT treatment sessions. More time was also devoted to preparing materials and supports in order to increase Jay's participation and engagement.

The CASTS data revealed that prior to intervention, the *Go Talk* communication software had been selected for Jay based on its availability within the school district. The team agreed the message capacity was too limiting, and explored the use of dynamic display communication software, *DynaMyte 3100*. Throughout the intervention process, the team discontinued the use of the *Go Talk* and switched Jay to only using the *DynaMyte* due to its increased vocabulary and message capacity. During the intervention, the team transcribed what Jay's classmates said throughout the day. A discrepancy analysis was completed to identify what Jay was able to communicate versus what needed to be added to his device in order for him to communicate with his peers. An immersion approach to modeling the use of the *DynaMyte* device was implemented. All of Jay's classmates received a copy of the core vocabulary overlay and were encouraged to use it during class discussions, lessons, and activities. The teacher used an enlarged copy during whole class instruction. In addition to this, direct instruction was provided to teach Jay core vocabulary on the *DynaMyte*.

Jay's entire team received training on how to program the device. By the end of the year, Jay had access to 80-100 curriculum-related messages, and the number of symbols per overlay ranged from 9 to 49. Jay communicated single words and word combinations. Jay was also able

to recognize eight words in print from three word choices with 100% accuracy and an additional 13 words with 75% accuracy.

This case study provided information about the outcomes for engaging educational teams in inclusive education for AAC users utilizing the *Beyond Access* model. Results indicated the use of the *Beyond Access* model contributed to improved team functioning and student learning outcomes in an inclusive, general education setting.

Myers (2007) conducted a 4-week intervention program to explore effective approaches, content, and contexts for supporting communication among individuals who require AAC. The purpose was to improve access to inclusion in mainstream school settings. Four students aged 5-9 participated in the study: Amy, Simon, Rosie, and Karie.

Prior to the intervention, parents completed a questionnaire to indicate language and literacy experiences, as well as friendships and frequency of peer interactions. Participants attended the Child Development and Rehabilitation Center for 2 hours of daily instruction, Monday through Friday, for a 4-week period of time. The intervention focused on developing verbal communicative skills, supporting literacy skills, and fostering independence with technology. The first theme was Conversations, which was focused on increasing conversation skills for the participants and using vocabulary during turn-taking games. The second theme of Feelings introduced vocabulary related to self-expression and social closeness. The final theme was Others, which focused on vocabulary to communicate competently and maintain conversations. Following the intervention, a follow-up phase took place 6-8 weeks later that consisted of four visits to the participants' schools to observe students in the school setting and share effective strategies with school personnel and teachers.

Although Amy had made excellent progress in the intervention, when observed at school Amy did not maintain her progress. Her teacher had never taught a child who use AAC and felt that it was a distraction to other students in the class. Amy's father complained he did not feel welcome in the school, so he did not attend educational meetings in the school setting regarding her programming. Amy's rare use of her SGD at school limited her involvement and inclusion in the classroom setting. Reasons for non-use included, "It'll get broken," "The battery is dead," and "We should encourage her speech," among others.

In spite of these obstacles, Karie made progress, specifically in her expressive communication on her SGD. Although the school district was reluctant to support parent requests for AAC, their proactive stance and the evidence provided via Karie's videotapes, work samples, and assessment data persuaded the district to fund the *DynaMyte* in the school setting.

The study revealed that access to inclusion depends on the school district's ability and willingness to work with educational teams to ensure positive transitions to new school settings and adequate training of those working with children who utilize AAC devices. It also illustrated the importance of parent involvement, although due to the sample size and qualitative nature of the study, the results could not be generalized. An additional limitation of this study was that classroom teachers were frequently unable to attend the meetings during the post-intervention period due to other teaching responsibilities.

Chung et al. (2012) explored the naturally occurring social interactions for students with disabilities who use AAC in general education classrooms. Observers addressed four questions: What is the nature of social interactions occurring between students with developmental disabilities and their peers and adult in general education classrooms? To what extent are social

interaction episodes associated with contextual variables? What communication opportunities were provided to students who use AAC? What were the primary perceived functions of students' conversational initiations? (Chung et al., 2012, p. 351).

The study was conducted in eight elementary and four middle schools across one urban and four suburban school districts in a single county within a midwestern state. Participants included nine elementary and seven middle school students identified with Intellectual Disability and/or Autism Spectrum Disorder and who had social and/or communication IEP goals. Twelve students used electronic communication devices and six students used non-electronic systems (e.g., communication book, pictures strips).

Direct observations were conducted using momentary time sampling at the beginning of each 1-min interval, and event recording procedures were used to characterize the nature of the social interaction (e.g., its length, communication modes, prompts required, and communicative function). Data were also collected on the contextual features of the classroom, as well as nature and perceived function of the interactions occurring between focus students and their staff and peers. Each student was observed four times for the entire class period.

Results indicated that during approximately two-thirds of the observed 1-min recording intervals, some type of social interaction occurred between the focus students and adults and/or peers in their general education classes. On average, 89% of interactions took place exclusively with adults, 4.9% exclusively involved peers, and 5.7% involved both peers and adults. Length of interactions varied considerably. Approximately 48.8% of interactions were less than 5 s. Students with disabilities initiated 14.4% of interactions. Electronic devices accounted for 13.3% of opportunities, whereas the most commonly used communication mode was facial

expressions, which accounted for 41.3% of interactions. The most frequently perceived communicative function was to express wants and needs, occurring on 38.9% of opportunities.

Despite the fact that students were included in their general education classes, students with disabilities almost exclusively interacted with their support staff. Although these students were reported to use some type of AAC system, they infrequently used it and relied upon facial expressions. The author reported it is essential that interaction opportunities be carefully planned, students have ongoing access to functional and appropriate AAC systems, that students are equipped to be active communicators, and that support staff help provide meaningful interactions for students with their age-appropriate peers.

Chung and Carter (2013) examined the effects of an intervention in the secondary mainstream setting for two students with intellectual disabilities and/or autism who utilized AAC devices to communicate. Brian utilized an iPod touch with *Proloquo2Go* and Laura utilized a *Vantage Lite* SGD. A multiple baseline design was used across participants and classrooms to evaluate the intervention.

The multicomponent intervention included improving paraprofessional facilitation, peer initiation, and SGD access. Each paraprofessional who worked with the focus students received 2-2.5 hours of individual training with a combination of PowerPoint slides and worksheets related to the PACKERS strategies: Proximity to peers, Access to device, Create opportunities, Keep monitoring, Encourage students, Reduce support, and Score interactions. Peer partners received 45 min of training to learn how the SGD worked and how the student would use it to communicate. During the training, peer partners identified possible times for and ways to interact that included obtaining students' attention first before initiating conversation; using

different ways to communicate such as sign, gestures, and/or the SGD; asking different questions; waiting for the student to respond; locating the message on the SGD if needed or providing prompts; and responding to the peer. Parents and paraprofessionals also worked with the interventionist to identify vocabulary and content that could be added to the device, such as preferred activities and jokes. They were also trained on the maintenance and programming of the SGD in an effort to increase the likelihood the SGDs would be used in school and during peer interactions. Periodic check-ins with paraprofessionals and peer partners were provided three to six times for each student. The interventionist also had peer partners sit next to the focus students in the classes.

Data were collected on the focus students' peer interactions using 1-min partial interval recordings, and 1-min momentary time sampling was used to record the students' academic engagement in the mainstream classroom setting. Dependent variable data included peer interaction, SGD and other communication modes, proximity, instructional formats, and academic engagement.

Observations were completed 2-3 times weekly for 40 min over the course of 4 months. Brian was observed in his mainstream classes of science and art, whereas Laura was observed in social studies and homeroom. The interventionist and another doctoral student worked as observers, practicing coding together until they reached a minimum of 80% interobserver agreement. Data were collected on number of student-initiated and peer-initiated interactions, type of communication mode (facial expression, gestures, signs, speech, vocalizations, and SGD), as well as the instructional format and academic engagement in the observed intervals.

Prior to the intervention, neither Brian nor Laura used their SGD to interact with peers at all. After intervention, Brian was observed using his SGD with a mean of 5% of the intervals in science class and during 6% of the intervals in art. Laura improved to using her SGD to an average 27% of observation intervals during social studies and 14% of observation intervals during homeroom. Peer interactions remained similar in Brian's science class (49% to 49%) and increased from 5% to 36% of the observation intervals in art. Laura increased interactions with peers from 5% to 85% of the intervals in social studies and from 0% to 46% of the intervals in homeroom. Interaction with peer partners and other peers in the class increased in all settings, other than Brian's science class that already had a baseline of a high number of peer interactions compared to all classes. After intervention, the proximity of the SGD to focus students was noted from an average of 23% to 86% of intervals for Brian in science and 48% to 91% of intervals in art. Proximity of the SGD to Laura increased from 12% to 81% of the intervals in social studies and from 0% to 48% of the intervals in homeroom. No changes in academic engagement were observed across phases, which suggested that the intervention did not result in less engagement.

Post-study interviews with the paraprofessionals indicated that although strategy implementation was manageable, they did encounter some technical difficulties with the SGD in attempting to program the correct vocabulary on the device ahead of time. Peer partners and the general educators reported positive experiences for the focus student and peer partners, and Brian and Laura's parents shared a positive impact of the intervention with regard to social skills and usage of the device.

The data in this study supported the acceptability and benefit of peer interaction intervention and provided insight into strategies for promoting social interactions. A limitation of this study was that special education teachers and SLPs were not actively involved. In addition, data were collected on only two focus students.

### **Attitudes and Perspectives**

This section includes seven studies that evaluate student and teacher attitudes and perspectives toward students who utilize AAC devices. Two unpublished scales were used in these studies to measure student and teacher attitudes: the *Professionals' Attitudes Regarding Children who Communicate Augmentatively* (PARCCA) and the *Assessment of Attitudes Toward Augmentative and Alternative Communication* (AATAAC). The PARCCA is a 36-item, 5-point Likert scale that was designed to assess adult attitudes toward AAC in three dimensions: affective, cognitive, and behavioral intent. The AATAAC is a 26-item, 5-point Likert scale designed to assess attitudes of elementary-age school children toward peers who use AAC.

Beck et al. (2001) conducted two studies to evaluate perceptions. The first study involved the creation and validation of the PARCCA for measuring adult-aged school personnel's toward children who use AAC. After the PARCCA was validated, the researchers used it to discover the influence of disability, AAC technique, and user competency on the attitudes of adults toward a child who uses AAC.

Participants included 188 college students enrolled in an Introduction to Special Education course at a midwestern university. Ninety-one percent of the participants indicated they had worked with or interacted with a student with disabilities within the last 6 months, although only 19% of them had experience with children who used AAC.



A videotape was created for each experimental condition: disability information (none, mental retardation, physical disability), technology level (low, high) and competency level (low, high). Each video had an opening information segment, conversation segment, and closing instruction segment with definitions and demonstrations of low- and high-AAC. For example, four videos described a child who could not speak due to mental retardation, four described a child who could not speak to a physical disability, and the remaining four videos had no information regarding the disability area. The second part of the video showed a child using AAC conversing with a female adult, with only the hand and arm of the AAC user shown to reduce any potential biases.

In half of the videos, the child communicated using a non-electronic picture communication board with 32 pictures, but no printed words. In the other half, the child communicated using the *DeltaTalker* by Prentke Romich. The *DeltaTalker* used the same overlay as the non-electronic communication board, but with speech output. Half of the videos portrayed a high-competent AAC user with a mean response time of 1.63 s when using low-technology videos and 1.74 s for high-technology videos, and the users were not prompted. The other half of the videos portrayed a less competent AAC user, with the mean response time for low-technology videos of 4.63 s and 3.53 s for the high-technology videos. In these low-competency videos, the child was prompted several times before responding. The same conversational script was followed in all videos. In the closing section of the video, users were given directions and distributed the PARCCA.

Four three-way ANOVAs were completed to investigate the influence of disability label, user competency, and type of AAC technique on each dependent variable. Competency level

was the only statistically significant main effect ( $p < .05$ ). Participant evaluations of the child who communicated with high-competency were more positive than a less competent AAC user, although statistically significant interaction effects were observed. These results were unexpected, because many researchers and specialists believe that if a child is provided with a high-technology device, individuals would perceive them more positively.

A potential limitation of this study was that all participants were majoring in education where they would work with children, which might have given them more positive views than non-education majors. In addition, they may not have felt comfortable that they would be responsible for a student who used a high-technology AAC device. Another potential limitation is that 91% of the participants were females, and females have been shown to have more positive attitudes toward individuals with disabilities than males.

Beck and Fritz-Verticchio (2003) conducted a school-based intervention designed to increase the positive nature of children's attitudes toward peers who utilize AAC. Participants included 95 children over the course of 2 consecutive academic years: 30 students were in grade 2, 31 students were in grade 4, and 34 were in grade 6. All of the children attended the same small, suburban elementary school in which no children with significant disabilities attended. Seventy-six percent of them indicated they did not know someone their own age who had a disability.

Students were evenly divided into two groups. The first group received information about AAC. The information was presented in a short paragraph describing AAC and why children use it. They then viewed the video "Assistive Technology: We Can Do It!" Children in the second group were in the role-play group. These students received the same information

about AAC. In addition, these students were given a *Go Fish* communication board and a deck of cards. They had to play this game using only their communication boards and they could not speak. After the completion of group activities, the AATAAC was administered to measure children's attitudes toward peers who use AAC.

AATAAC scores were analyzed with a 2 (information vs. role-play) x 3 (grade level) ANOVA. Results indicated that neither the main effects of group or grade level were significant. However, the two-way interaction of group by grade level was significant ( $F_{(2, 89)} = 3.27$ ,  $p < .04$ ). Results of the 2 (group) x 2 (gender) ANOVA indicated that the main effect of gender was significant ( $F_{(1, 91)} = 8.876$ ,  $p < .004$ ), as was the interaction of information group by gender ( $F_{(1, 91)} = 9.4$ ,  $p < .003$ ). The main effect of information group was not significant.

Results indicated that in some cases providing children with information on AAC and the opportunity to role play was effective in positively influencing their self-reported attitudes. Results also showed the attitudes of the oldest children were more influenced by being able to role-play being nonspeaking than were those of younger children. Attitudes may also have been influenced by frustration when role playing during the game of *Go Fish*. Beck and Fritz-Verticchio (2003) pointed out that "attitudes are not synonymous with behavior" and how children ranked their attitudes and perspectives might not dictate how they actually behave or interact with AAC users (p. 56).

Kent-Walsh and Light (2003) investigated the experiences and attitudes of 11 United States general education teachers who had previously included students in their classes who utilized AAC. Data were gathered through qualitative interviews regarding benefits, negative aspects, barriers, supports required, and recommendations. Teachers were interviewed either in-

person or over the phone one time ranging from 30 min to 1 hour by the primary researcher. The audiotaped interviews were transcribed and then analyzed using a -step procedure:

1. An outline of all paraphrased items was generated for each interview.
2. Each transcript was examined for the occurrence of themes
3. Themes were compared across interviews.
4. Themes and operational definitions were established to code themes and sub-themes.

A summary with identified themes and sub-themes was sent back to the participant to ensure the information was accurate, which all participants agreed it was.

5. After items were aligned according to coding theme, reliability was determined to be 0.87.

The final themes were coded as: (a) benefits of inclusion; (b) negative impacts of inclusion; (c) barriers to inclusion; (d) supports for inclusion; (e) recommendations; (f) descriptive information about teachers, students, class, or school; and (g) unrelated or uncodable statements.

The participants discussed benefits of inclusion for students who used AAC, parents, classmates, and teachers, such as successful inclusion experiences, increased interaction with peers, increased acceptance for individuals with disabilities, and personal growth and learning. They shared negative impacts of educational inclusion for students who used AAC, classmates, and teachers, including the time-consuming nature, classroom disruptions, social exclusion, and the lack of educational gains. They discussed eight types of barriers to inclusion: school-related, team-related, teacher-related, educational assistant-related, classmate-related, target student-related, curriculum-related, and AAC-related. Some of these concerns involved AAC access and

repair issues, negative student attitudes, communication skill limitations, lack of communication, teacher burnout, disregard for job-related responsibilities, lack of training, and lack of consistency. Six inclusion supports were discussed: school-related, team-related, teacher-related, classmate-related, curriculum-related, and AAC-related. These included adequate planning and preparation, knowledge and support of team members, positive attitudes, consistency, peer acceptance of students, and provision of means to participate.

The participants shared recommendations that included communicating, remembering students' humanity, involving students in classroom activities, providing adequate training and collaboration, providing the general education teacher with support from specialists, and selecting an appropriate AAC system for students. According to the survey participants, numerous supports must be in place in order for inclusion to be successful.

Limitations of this study included the small sample size. In addition, because the teachers lacked experience working with students who utilize AAC, findings cannot be generalized.

Beck, Bock, Thompson, Bowman, and Robbins (2006) wished to determine if the type of vocabulary programmed into an AAC device influenced children's attitudes toward their peers who use AAC. In this study, age-appropriate, informal vocabulary was programmed on an AAC to evaluate whether it would influence attitudes of elementary-age children toward a peer who used AAC, and also if gender and grade would be factors that influence attitudes. Participants included 84 children in fourth and fifth grades from two public grade schools in a midwestern community of 110,000 who were familiar with peers with disabilities. Students who participated

answered *yes* to one of the following questions: “*Do you have a friend who has disability?*” and “*In the past week have you played or talked to a child who has a disability?*” (p. 59).

Two videotapes were created that showed a child communicating using an *AlphaTalker* communication device by Prentke Romich. The *AlphaTalker* uses a social script with 18 and 19 conversational turns. To reduce biases, only the forearm and hand of the child accessing the device were visible in the videotapes. In one videotape, formal English was used; in the other the child communicated using current, age-appropriate informal terms. Both videos were approximately 2 min long with the same topic: *Harry Potter and the Sorcerer’s Stone*.

Students in the fourth- and fifth-grade classrooms were randomly assigned to one of two groups. One subgroup watched the video containing informal terms; the other subgroup watched the video containing formal English only. After watching the video, students completed the AATAAC.

A 2 (informal vs. formal English) x 2 (gender) x 2 (grade 4-grade five) ANOVA was calculated. Results indicated a main effect of gender ( $F_{(1, 76)} = 12.42, p = .001$ ). Mean AATAAC scores for girls (3.88) were higher than males (3.53). No significant differences were reported for grade or vocabulary. The only interaction effect was gender by grade: ( $F_{(1, 76)} = 3.958, p = .05$ ). Girls’ self-reported attitudes increased from grade 4 to grade 5, whereas boys’ became less positive. For grade 4, 3% of the variation was explained by gender; for grade 5, 33% of the variation was explained by gender.

In general, self-reported attitudes of girls were more positive than those of boys, although the type of vocabulary had no effect on attitudes. Beck et al. (2006) speculated this could be due

to the specific informal terms used, theories of peer acceptance, or the voice recorded on the *AlphaTalker*, which was that of a young female in her 20s.

Finke et al. (2009) facilitated a qualitative focus group to investigate the experiences of five elementary school teachers who had students with Autism Spectrum Disorder (ASD) in their general education classroom who used AAC devices. All five teachers were female, ranged from no training in special education to a master's degree, and the level of inclusion varied from specials only to full-day inclusion.

Forum, password-protected "guestbook" software was used that allowed text-based discussions, posts, and comments in order for the focus group to communicate virtually. To analyze data, topical themes were derived using operational definitions, data were coded according to operational definitions, and areas of agreement and disagreement were analyzed to create sub-themes as necessary. The research group discussed any coding differences until agreement of 0.83 was reached. The summaries were emailed to each participant, and all five participants verified the summaries reflected accurately the focus group discussions.

The focus group took place during a 15-week period of time. The focus group discussed benefits of inclusion, the negative consequences of inclusion, the challenges to inclusion, and supports for inclusion with regard to classmates, teachers, parents, and classrooms. Some of the benefits included skill development, participation in the classroom and with classmates, reduction in challenging behavior, awareness and acceptance of children with ASD, and enjoyment of seeing progress made by all students. Some of the negative consequences of inclusion included increased stress, an increase in challenging behaviors, an increase in noise, frequent class interruptions, increased time required for planning and preparation, and unmet

hopes/expectations for a child with ASD. Some challenges to inclusion included lack of time to collaborate, the need for appropriate supports, how to find appropriate curricular matches, and the need to understand roles and responsibilities. Necessary supports for inclusion included daily communication, positive attitudes about inclusion, provision of time and needed tools and materials, willingness to collaborate with other team members, promotion of understanding of diversity, and willingness to help all students.

The participants made recommendations related to educational inclusion of children who require AAC, specifically children with ASD. For general education teachers they recommended communicating and collaborating with parents and professionals, seeking training on ASD and AAC, providing routine and structure in the classroom, maintaining a positive outlook on inclusion, being flexible, and maintaining open lines of communication. For educational teams, they recommended seeking training, maintaining a positive outlook on inclusion, keeping student interests in mind in decision-making, maintaining open lines of communication with parents and professions, meeting regularly, and being consistent. For parents, they recommended maintaining open lines of communication, sharing knowledge, keeping an open mind and positive attitude, and connecting with other parents. For administrators, they suggested ensuring training is available, listening to staff concerns, communicating with parents, staying educated, and keeping a positive attitude, and thinking about class size. Participants found that the benefits outweighed the challenges when including students with AAC.

Limitations of this study included the small sample size that included only elementary students. In addition, because these teachers all self-identified as having successfully included a child with AAC, this may have contributed to their positive opinions toward inclusion.



Beck et al. (2010) had previously developed the AATAAC-2 rating scale to investigate adolescents' attitudes towards their peers who use AAC. This particular study examined influences of familiarity with people with disabilities; type of AAC device; and various combinations of gender of rater, AAC user, and communication partner on adolescents' attitudes.

Participants included 136 students with and without disabilities from two public high schools in central Illinois. Eighty-nine students attended one school, and 47 attended the other. Seventy participants were male; 66 were female. Participants were shown one of eight different experimental videos, each with a different condition. These conditions were created using four different gender combinations (e.g., male AAC user interacting with male, male AAC user interacting with female). Each of the combinations was recorded twice, once with user accessing static touch screen AAC device and once with AAC user accessing a dynamic touch screen AAC device. Only the hand and arm of AAC user was shown in each video, and the same conversation script was used for all eight videos. Groups of eight participants at a time were shown one of the eight videos to view. Participants were presented with a definition of AAC, two presentations of the same video, and written instructions on how to complete the AATAAC-2 questionnaire on a computer.

AATAAC-2 data were analyzed using two three-way ANOVAs, with the mean AATAAC-2 score serving as the dependent variable. Results from the first analysis indicated a significant main effect for gender ( $F_{(1, 132)} = 9.923, p = .002$ ). No other main effects or interactions were significant regarding gender of AAC user or gender of communicative partner. For the second analysis, the main effect of familiarity was also significant ( $F_{(1, 132)} = 5.985, p = .016$ .) The type of device did not produce statistically significant results.

The main effect of gender indicated that females had more positive attitudes than males toward their peers who use AAC, as well as having more positive attitudes if they were more familiar with students with disabilities who utilize AAC. It is important to note that a limitation of these main effects was their small effect size, as well as the fact that this was a perceptual study, not a behavioral study. Although participants recorded their attitudes, they did not record how they interacted and behaved toward AAC users—which could be different. The results indicated that maintaining familiarity between students who use AAC and their peers is important for enhancing positive attitudes of AAC users.

To examine friendships with AAC users, Anderson, Balandin, and Clendon (2011) interviewed six typically developing students who were interviewed about their friendships with classmates with disabilities who utilize AAC. Friends of three children who utilized AAC were the basis of this study. Their classroom teachers identified two friends for each student who willingly interacted with them regularly. Three boys and three females ages 7-14 from three different schools participated in the study. Each of the six students completed two 30-60 minute interviews. The interviews were audiotaped and transcribed.

Open-ended topic starters were used throughout the interviews to help generate and share interactions related to their personal experiences, stories, and memories, along with follow-up questions and questions specific to the information shared by the participants. The paraphrased data and direct quotes were turned into an illustrated picture book using the *storybook method* (Anderson & Balandin, 2011), and shared with the students on their second interview. This method was used to help students expand upon their previous ideas, clarify misconceptions, and provide summarizing statements. Each individual story was combined to form a narrative,

sharing similarities and differences in the participants' experiences. Issues and themes were identified. Discrete examples were taken from text to highlight similarities and differences in their experiences.

Findings indicated social values and attitudes toward disability affect the ability to form a friendship. Four of the participants shared it was their first friendship with a student who had a disability. Altruism played a role in the maintenance of all the students' friendships who participated in the study. The personalities of the students also played a role, with participants sharing positive personal qualities they enjoyed. They discussed having the understanding and knowledge of their friend's needs. Shared experiences and interests were important, and participants recognized that having a friendship with a child with a disability is different than a friendship with a nondisabled peer. The differences related to learning, helping, interactions, and shared time.

Overall, all participants viewed the friendships positively. They recognized that friendships with students who utilize AAC often involve other responsibilities. Participants reported helping with schoolwork, mobility around the school, classroom routines, and translating between other peers and the student who utilized AAC. They shared they enjoyed helping, but sometimes felt uncomfortable when asked to assist with personal or daily living tasks. They also shared that interactions are different, which could be due to the device working incorrectly, lack of proficiency, not understanding sign language, or any other multitude of reasons. The participants shared concerns that students with disabilities would not have all of the same life experiences as their typical peers such as dating and employment, and they avoided talking about these experiences. They also participated in different activities. With typical

peers, they engaged in sports or more physically active games, whereas their friends with disabilities tended to engage in calming activities such as crafts, board games, and television. Students identified a benefit of having a friend with a disability was learning new skills, one of which was sign language. The participants shared ways they showed empathy and attempted to include friends in everyday activities in which they normally could not participate.

### Summary

This chapter provided a review of 13 studies that examined inclusion outcomes for individuals who utilize AAC and the attitudes and perspectives of peers and teachers toward them. Table 2 describes the authors, design, participants, procedures, and results for each article. Conclusions and recommendations are discussed in Chapter 3.

**Table 2**

### Summary of Chapter 2 Findings

AUTHORS (DATE)	DESIGN	PARTICIPANTS	PROCEDURE	RESULTS
Beck, Thompson, Clay, Hutchins, Vogt, Romaniak, & Sokolowski (2001)	Quantitative	188 college students who were enrolled in "Introduction to Special Education" course offered at midwestern university	Twelve videotapes for each experimental condition relating to type of disability, technology level (low or high), & competency level (low or high). Students watched an introduction, social script with assigned variables, and then were asked to complete the PARCCA.	The only statistically significant main effect was the competency level on cognitive attitudes. When the student was highly competent with the AAC device, the user scored higher attitudes on the PARCCA. The type of AAC used (high/low) and type of disability label had no effect on attitude scores.

Table 2 (continued)

AUTHORS (DATE)	DESIGN	PARTICIPANTS	PROCEDURE	RESULTS
Hunt, Soto, Maier, Muller, & Goetz (2002)	Qualitative	3 students who utilized AAC from two elementary schools in the San Francisco Bay area	Unified Plans of Support were developed for each student. Monthly meetings were held in order to increase academic and communication supports. Students were observed using 30-s partial observations measuring interaction and engagement.	Overall interaction levels, interactions with classmates 1-on-1, and initiated interactions increased for all students. Levels of non-engagement decreased for all students.
Beck & Fritz- Verticchio (2003)	Quantitative	95 students grades 2-6 in suburban elementary school	A commercially produced videotape: "Assistive Technology: We Can Do It!" was shown to students. 1 group was only shown video and asked to complete AATAAC, the other group had to play Go Fish using only communication boards to mimic being nonverbal and then asked to complete the AATAAC.	The main effects of group (information vs. role-play) and gender were both not statistically significant with regard to attitudes toward AAC users.
Kent-Walsh & Light (2003)	Qualitative	11 general education teachers who had students who use AAC in their classes	Interview regarding benefits of AAC, negative aspects, barriers of successful inclusion, supports required for successful inclusion, and recommendations for teachers and professionals.	There was a significant amount of benefits and barriers to successful implementation and inclusion for students who used AAC, their classmates, and their teachers.
Beck, Bock, Thompson, Bowman, & Robbins (2006)	Quantitative	84 children in grades 4 and 5 selected from two public grade schools in the same midwestern community	Students were assigned to view one of two videotapes showing a non-disabled child communicating with an adult using an AAC device using a social script. One used only formal English and the other used informal terms. They then completed the AATAAC.	Females had significantly higher ratings on the AATAAC than males. Data on type of vocabulary used were not statistically significant.

Table 2 (continued)

AUTHORS (DATE)	DESIGN	PARTICIPANTS	PROCEDURE	RESULTS
Lilienfeld & Alant (2005)	Qualitative	Single case study of 15-year-old male who utilized AAC	Student was observed in his classroom to measure the number of interactions during teacher-directed time, small group discussions, and informal time. A peer-training program and use of a communication device were implemented during the intervention period.	Even after the intervention, student continued to utilize his voice as primary form of communication even though it was unintelligible.
Sonnenmeier, McSheehan, & Jorgensen (2005)	Qualitative	Single case study of 10-year-old male who utilized AAC	The student was switched to dynamic display communication software and received direct instruction on it, his peers and teachers received a copy of his vocabulary overlay, and his team met weekly to discuss his progress and prepare materials for his classroom.	The student improved from a primarily passive participant to an active participant who was able to communicate using single words and word combinations.
Myers (2007)	Qualitative	4 students ages 5-9 with developmental disabilities and severe speech impairments	Students participated in a 4-week intervention for 2 hrs daily where they engaged in individual, direct instruction and collaborative, workshop-style activities associated with weekly themes. Following the intervention, students were observed at school.	Results were split, as some students were able to maintain success utilizing their AAC device and others were not. This depended on parent involvement and what training was available in each district.
Finke, McNaughton, & Drager (2009)	Qualitative	5 general education teachers who had included elementary children with ASD who required AAC	Focus group online interview was obtained in the areas of benefits, negative impacts, challenges of inclusion, supports needed for inclusion, and recommendations for teachers involved in inclusion process.	Participants found inclusion was a beneficial practice, but described barriers, challenges, and recommendations for educational teams, parents, general education teachers, and administrators.
Beck, Thompson, Kosuwan, & Prochnow (2010)	Quantitative	136 students from two public high schools in Illinois ages 14-18	Students were given a definition of AAC, watched one of eight video clips of students with AAC devices participating in conversations and then were asked to complete AATAAC Likert scale form regarding their attitudes after viewing.	Gender produced a main effect. Females scored significantly higher attitudes than males. Level of familiarity with students with disabilities who use AAC devices was also significant.

Table 2 (continued)

AUTHORS (DATE)	DESIGN	PARTICIPANTS	PROCEDURE	RESULTS
Anderson, Balandin, & Clendon (2011)	Qualitative	6 students who had frequent interactions with students who utilize AAC from three elementary schools	Students participated in two 30-60 minute interviews using open-ended topic starters addressing their friendships and interactions with students who utilize AAC. A thematic narrative methodology approach was used to analyze the participant's friendship stories.	Regardless of challenges and the differences, all participants indicated students who utilized AAC were their friends. The childcare's social values and attitudes toward disability impacted outcomes.
Chung, Carter, & Sisco (2012)	Qualitative	16 students who used AAC (nine elementary and seven middle school students) in eight different elementary and four middle schools	Students who utilize AAC were observed in their classrooms using interval recording to record information about classroom content and event recording for each social exchange they had.	Students with AAC primarily interacted with paraprofessionals and special educators as opposed to their peers.
Chung & Carter (2013)	Qualitative	2 students who utilized AAC in elementary schools in the midwest.	Students who utilize AAC were observed in their mainstream classes. An intervention involving paraprofessional facilitation, peer initiation, and SGD access was implemented.	Use of communication device, peer interactions, and proximity of the SGD to focus students increased for both students.

### **Chapter 3: Conclusions and Recommendations**

As a special education teacher for students with cognitive disabilities, I have the opportunity to work with a number of students who use augmentative and alternative communication (AAC) devices as their primary form of communication. When my students are included in general education settings, I often witness peers and adults who are uncomfortable interacting with students who use these unfamiliar devices. I conducted this review of literature in order to learn more about the attitudes of general education teachers and students toward individuals with severe disabilities who utilize AAC devices to communicate. In addition, I wished to examine more closely the outcomes for students who use AAC devices in the general education setting.

Historical information and theoretical background information were shared in Chapter 1I, followed by the review of 13 research studies in Chapter 2II. In this chapter, I present conclusions, recommendations for future research, and implications for practice.

#### **Conclusions**

Simply putting students who use AAC into the general education classroom is not nearly enough. Most often, students communicate with their support staff as opposed to their general education teacher and peers, or simply do not communicate or are engaged at all. A collaborative team approach is needed to: (a) actively increase AAC users' engagement and peer communication outcomes in an inclusive setting, and (b) improve the overall attitudes and perspectives of staff and students who interact with AAC users.



## **Inclusion Outcomes**

Six studies were reviewed regarding inclusion outcomes for students who utilize AAC devices in the mainstream school setting. Generally speaking, most studies yielded increases in communication opportunities for AAC users when interventions were used within the general education setting. Themes discussed in this section include team approach, time commitment, peer training, support staff, and parental involvement with regard to successes and challenges.

*Team approach.* \_ Hunt et al. (2002) and Sonnenmeier et al. (2005) utilized a team approach that focused on the use of monthly meetings and a collaborative team approach to help make the target students successful in the mainstream setting. Although both studies produced positive results, they recognized the amount of time required in weekly and monthly meetings—time that that typically is not available. Team members in the Hunt et al. study expressed satisfaction with the collaborative process because it allowed them to support and empowered each other, rather than relying solely upon the speech-language pathologist (SLP).

Chung and Carter (2013) recognized their lack of including all stakeholders in the project as a limitation in their study, stating the importance of team collaboration and exploring key stakeholders' perspectives. They noted they did not actively involve special educators or SLPs in their intervention process, and contended this would have increased device use and peer interactions in the classroom.

*Time commitment.* All 13 studies concurred that maintenance tasks and collaborative time commitments are not always feasible in the school setting. If time is made available, students could be highly successful implementing their AAC devices interventions and communicating effectively in an inclusive setting.

Team and parent participants shared that weekly meetings could be a challenge for some teams, especially if there are several students needing extensive supports in one school. The time spent on one student might be perceived as affecting staff availability to work with or discuss other students. However, organizational changes could result in more planning time for every student's team.

*Peer training.* One of the barriers of implementing peer training is a lack of validated training materials and procedures (Chung & Carter, 2013; Lillienfeld & Alant, 2005; Sonnenmeier et al., 2005). Despite this, the use of peer training programs proved to be quite effective in increasing student engagement and device use.

Peer training programs received positive feedback from parents, paraprofessionals, and teachers, as well as dramatic increases in the overall number of communication opportunities (Chung & Carter, 2013; Sonnenmeier et al., 2005). Sonnenmeier et al. used an immersion approach to model use of the focus student's communication device. All of his classmates and teacher had copies of his core vocabulary overlay and were encouraged to use it during classroom activities to help model for him. The teacher's overlay was projected onto the screen at all times. Chung and Carter (2013) used a different approach that involved collaboration with the interventionist to learn about how speech-generating devices were used to communicate, different communication opportunities with the focus students, and shared strategies to interact with them.

Lillienfeld and Alant (2005) used a similar approach in their training where peers were informed about the basics of AAC and specific challenges the focus student was encountering with his daily communication. However, in this study the focus student was present for the

training and students were given the opportunity to practice communicating with him. However, they yielded much different, less positive results. The focus student never showed a desire to use his communication device and continued using speech as his primary form of communication, even though it was unintelligible. Although the peer-training program did significantly increase his communication opportunities, it did not increase his AAC device use, which was the intent of the study.

Myers (2007) agreed with Lilienfeld and Alant's (2005) results in that not all interventions proved to be successful, as demonstrated by the varied results for each student in their study. Some students made progress and experienced success, whereas others did not. Following the intervention when the students returned to school, three factors were crucial in maintaining progress: teacher familiarity, attitudes, and comfort with the device. One teacher suggested having the student use her speech instead of her communication device, even though her speech was unintelligible. The authors asserted it is critically important to determine acceptance of AAC in the classroom.

*Support staff.* Chung et al. (2012) and Chung and Carter (2013) agreed that paraprofessionals play a significant role in successful inclusion, as they are primarily the ones who are with the students. Paraprofessional training was shown to be effective in increasing the number of interactions between AAC users and their peers, and the paraprofessionals in the study described their own experiences as positive and beneficial (Chung & Carter, 2013). Unfortunately, the researchers pointed out that paraprofessionals often were unable to join the collaborative team meetings because they needed to be working directly with the students.

Chung et al. (2012) pointed out that often students relied upon facial expressions and gestures to their paraprofessional staff. In their observations, students' AAC devices often were not brought to class, were left in backpacks, or never activated. This finding illustrates the importance of the paraprofessional role in ensuring that devices are in close proximity to students and that they are using them to actively communicate instead of relying on facial expressions and gestures. In addition, one-on-one support from paraprofessionals may inadvertently have a suppressive effect on interactions with peers. They shared it is important support personnel hold high expectations and support meaningful interactions among the students with whom they work.

*Parent involvement.* Parent involvement in the entire process is important in order to program the device with the appropriate and necessary vocabulary (Chung & Carter, 2013; Hunt et al., 2002; Myers, 2007; Sonnenmeier et al., 2005). Including parents as part of the team approach increased student device use at home, enhanced their own skills with the device and programming it, and increased their overall awareness of the inclusive process. Myers found that by scheduling Friday sessions as part of the program, parents had the opportunity to provide input, observe and practice new strategies, and ask questions.

### **Attitudes and Perceptions**

Seven studies investigated peer and adult attitudes toward AAC users in the mainstream setting. Four employed the PARCCA and AATAAC surveys to assess peer and adult attitudes toward AAC users (Beck et al., 2001; Beck & Fritz-Verticchio, 2003; Beck et al., 2006; Beck et al., 2010). These studies recognized that asking peers and adults to complete a questionnaire asking their opinions versus actually observing their interactions with AAC users could yield very different results. Kent-Walsh and Light (2003), Finke et al. (2009), and Anderson et al.

(2011) used an interview approach with focus questions to gain knowledge from teachers and students who interact with AAC users. Several factors were shown to affect the attitudes of staff and peers toward AAC users: the type of communication device, vocabulary, competency level of the user, males vs. females, friendship, teacher experiences, and disability awareness.

**Type of communication device.** Beck et al. (2001) and Beck et al. (2010) both researched whether the type of communication device impacted peer attitudes. Beck et al. (2001) found that the type of AAC technique used had no effect on overall attitude scores, which was quite an unexpected finding. Many interventionists believe that if a child is provided with a high-technology device, other individuals will perceive them more positively. The Beck et al. (2010) second study utilizing a static touch screen and dynamic touch screen communication device also produced unexpected results when they found it was not effective in changing attitudes. This is an important consideration as part of the SETT process.

**Type of vocabulary.** Beck et al. (2006) were the only researchers to investigate the type of vocabulary. Their study of informal versus formal English vocabulary did not impact student attitudes toward the AAC user. This finding does not support the practices of teachers and SLPs, who encourage the use of informal vocabulary in communication devices. Certainly, other variables may have affected study outcomes and should be evaluated.

**Competency level of user.** Beck et al. (2001) were the only researchers to examine competency level of the user, and their findings were statistically significant. The amount of wait time played a role in the participants' attitudes. Children who hesitated or who were frequently prompted to respond yielded lower or more negative attitudes from the teacher candidates.

**Males vs. females.** Beck and Fritz-Verticchio (2003), Beck et al. (2006), and Beck et al. (2010) all found that females had a more positive attitude approach toward AAC users, which supports previous research regarding attitudes towards individuals with disabilities. They suggested that preadolescent girls tend to be more concerned with caring about others and relationships. All studies measuring the effect of gender indicated that females had higher mean scores than males.

**Friendship.** Anderson et al. (2011) discussed attitudes with regard to friendship. Several features motivated and maintained friendship, including children's social values and their attitudes toward disability. They shared their friendships with peers as a fun and rewarding experience, emphasizing character traits such as understanding and patience. Those involved in the study indicated the friendships were not "normal" and were different than that of their other age-appropriate peers. This may imply peers were in the role of caretaker rather than friend.

**Teacher experiences.** Kent-Walsh and Light (2003) and Finke et al. (2009) interviewed general education teachers regarding their personal experiences with inclusion. Participants had very positive attitudes regarding their experiences with AAC users and shared benefits, barriers, challenges, and supports to successful inclusion.

**Disability awareness.** Beck et al. (2001) assessed preservice teacher attitudes toward individuals who utilize communication devices. Results indicated that the advanced-level students had significantly higher, more positive attitudes toward AAC users, which is consistent with past research that people who are more familiar with people with disabilities tend to have more positive attitudes toward them. Beck et al. (2010) and Anderson et al. (2011) found this to be the case for student familiarity. Conversely, Beck and Fritz-Verticchio (2003) discovered

boys who are familiar with children with disabilities may actually be less positive than those of children who are not familiar with children with disabilities. This remains a critical area of study and concern.

### **Conclusion Summary**

In the literature I reviewed, many themes emerged regarding successful strategies and techniques to implement, as well as many challenges to meaningful inclusion. Factors impacting attitude and perceptions toward AAC users were identified. As alternative and augmentative communication continues to expand and evolve, more research is needed to delve further into the topic.

### **Recommendations for Future Research**

Throughout these studies, researchers made numerous recommendations for future research. Few studies have been published on this topic, despite the level of inclusion occurring for students with moderate to severe disabilities.

Regarding successful inclusion, future research should evaluate strategies to prepare paraprofessionals for expanded roles in general education classrooms (Chung & Carter, 2013; Kent-Walsh & Light, 2003). Additionally, peer training strategies and programs should be researched, developed, and implemented in inclusive settings. Future research should also address staffing, instruction, and other factors that limit students' ongoing presence and participation in inclusive classrooms (Chung et al., 2012), including variables related to peer interaction (Lilienfeld & Alant, 2005) and team approaches (Hunt et al., 2002).

The experiences and attitudes of all stakeholders in the inclusion process, such as general education teachers at all educational levels and parents of AAC users should be researched

(Finke et al., 2009). In addition, the impact of disability awareness and the role it plays on the initiation and stability of meaningful friendships should be further investigated; for example, the role of friend vs. caretaker (Anderson et al., 2011). Possible strategies to increase male attitudes toward AAC users should also be an area of priority, as females have significantly more positive attitudes than males.

I was surprised at the dearth of literature on the topic of AAC in inclusive classroom settings, even though the use of AAC devices continues to increase and evolve. The research base regarding both attitudes and inclusion outcomes must be expanded. Effective supports for teams must be explored. The quality and amount of peer interaction and necessary core vocabulary should all be considered when AAC communication software programs are designed. When researching attitudes, I think it would be important to have research that measures student attitudes by completing the surveys, as well as observing and measuring how they actually behave and interact in the classroom. Many authors mentioned that saying something and doing something are completely different things.

### **Implications for Current Practice**

I know firsthand how overwhelming and intimidating it can be to communicate with someone who uses AAC. In my first year of teaching, I was asked to teach a technology class for students with AAC needs—for me, this was “baptism by fire.” Three years later, I am now the primary programmer for students’ AAC devices and am well-versed in their usage. In fact, AAC has become my passion. I work very closely with the speech-language pathologist (SLP) for programming and implementation of core vocabulary words and thematic vocabulary.



In the field of special education, teachers and specialists typically have large caseloads and inflexible schedules, which makes it difficult to find mutual planning times. On my current caseload, I have three students who utilize AAC as their primary form of communication. For my own professional growth and practice, I would like to experience this team approach to successful inclusion, but need to be aware of the time constraints and barriers to success. In order for me to successfully implement a team model as described in the literature, I must have in place the necessary supports from administration, parents, general education teachers, and other IEP team members. That said, after reviewing these studies, I plan to select one student to implement monthly meetings with the speech-language pathologist, primary paraprofessional, parent, and any other service providers. I think starting small is key in order to avoid being overwhelmed as I strive to provide meaningful communication opportunities for my students. The St. Cloud School District has started to implement this process, as students who are AAC users are each part of an ACCESS (Augmentative Communication Coaching to Ensure Student Success) team. Each student team consists of an occupational therapist, SLP, and physical therapist to help provide device access to best meet each student's needs and offer support to their IEP case managers and teams, paraprofessionals, and general education teachers.

Special education teachers must advocate for our students and push toward inclusive settings for them. I will continue to include my students in general education classes where they have the opportunity to interact with their age-appropriate peers and hopefully, raise peers' awareness and understanding of students who utilize AAC devices. I will present to the peers in each class about my students, how they communicate, and different approaches in interacting with them and including them in classroom activities. In addition to addressing the peers, it is

also important for me to recognize that the responsibilities placed upon general education teachers can be onerous. At the secondary level, teachers are responsible for a large number of students, and they lack training on how to interact with special education students and provide them with needed accommodations. General education teachers need to play an active role by providing AAC vocabulary needed for each instructional unit so that students can be prepared to participate meaningfully. It is crucial that I am present in these classrooms in order to support, train, and coach the general education teachers throughout the entire process.

It would be interesting to obtain a copy of the AATAAC and administer it to students in the classroom to evaluate their attitudes toward the AAC users on my caseload. I would also be interested to send out a survey to general education teachers to obtain their feedback and input regarding inclusion for students with AAC devices. This would also support the objectives of Project Evolve, a pilot program implemented last year at my school to reduce reliance upon paraprofessionals and increase student independence and participation in the mainstream setting.

### **Summary**

To address the complex needs of students with moderate-severe disabilities who use AAC devices in inclusive settings, a collaborative team effort is required. Special education teachers must ensure that general education staff and students understand how students can use AAC devices to effectively communicate socially and academically. Not only is it important for our students to be included, but for the peers around them to have open and accepting attitudes toward their alternative communication devices.

Special education teachers, SLPs, occupational therapists, general education teachers, paraprofessionals, parents, and peers must be willing to play an active role and take ownership in

the process as assistive technology and augmentative communication devices continue to evolve.

This quote by Helen Keller speaks very close to my heart, and I believe it captures the essence of this literature I reviewed: “Alone we can do so little, together we can do so much.”

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