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Challenges to Augmentative and Alternative Communication Interventions with Autism Spectrum Disorder Students

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Walden University
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Abstract

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MA, State University of California, San Diego, 1975

BS, University of California, Santa Barbara, 1971

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Students with autism spectrum disorder (ASD) have challenges with communication, social interactions, and behavior, which can limit their functioning in school settings. They need to have functional communication skills to access the curriculum and have their needs met across all social environments. Special education teachers often experience barriers to successful implementation of augmentative and alternative communication (AAC) interventions appropriate for these students. The purpose of this case study was to understand how special education teachers experience AAC intervention processes, and illuminate the conditions for effective AAC implementation. A qualitative case study was conducted using interviews from 6 credentialed special education teachers who worked with ASD students for a minimum of 2 years in a school district in a western state. Coding and thematic analysis of data from interviews and work journals was conducted using Ely's condition of change theory as a framework. Findings for teachers' perspectives of conditions needed to successfully implement an AAC intervention reflected the need for more time, resources, knowledge and skills, and investment from stakeholders. Recommendations included provision of resources to special education teachers for autism specific materials, on-going autism specific training and assistance, additional time for preparation and related duties necessary for working with these students. Future research on overall strengthening of AAC interventions and overcoming challenges for change is needed. Results of this study might assist schools in empowering ASD students by facilitating their functional communication skills, involvement, learning and academic opportunities across social environments.

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Dedication

In dedication to my father and mother for instilling the importance of education and work ethics. I also dedicate my degree to my husband for his continuing support and advice and to my sons who always offered encouragement. I want this dissertation to be an inspiration to them as a symbol of achievement and perseverance.

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Chapter 1: Introduction to the Study

Introduction

Autism spectrum disorder (ASD) is a disorder of brain development, characterized by weaknesses with social interaction, verbal and nonverbal communication skills, and repetitive behaviors (Grant 2016). School districts throughout the United States have experienced an increase in the number of students diagnosed with ASD in recent years. (Finke, McNaughton & Drager, 2009; Suriopoulou-Dell, Cassimos, Trisianis, & Polychronopoulou, 2012). In 2010, a group was formed to estimate the number of children in the U.S. with ASD, including other developmental disabilities is the Autism and Developmental Disabilities Monitoring (ADDM) Network, funded by the Center for Disease Control and Prevention (CDC, 2014). In 2010, the ADDM Network noted the overall prevalence of ASD was 14.7 per 1,000 (one in 68) children aged 8 years (CDC, 2014). As a result, of the steady rise in the number of students identified with ASD, policy makers, and educators are challenged with meeting the needs of this growing population through the provision of appropriate interventions and services (Koegel, Matos-Freden, Lang, & Koegel, 2012).

An intervention supported by research is the use of augmentative and alternative communication (AAC) interventions for students with ASD (Odom, Collet-Klingenberg, Rogers, & Hatton, 2010). Students with ASD require an effective functional communication skills program to express their wants, needs, and feelings with their peers and adults (Clark, 2013). Functional communication skills interventions include AAC systems for increasing expressive language skills for individuals of all ages and abilities

(Light & McNaughton, 2012). Light and McNaughton explained that AAC intervention is effective when it improves access and participation in various activities and experiences of daily life. AAC interventions would increase a student's participation in the classroom and allow special education teachers to share knowledge and experiences with the student. Students and special education teachers should be provided multiple ways to communicate and share knowledge. Franco, Davis, and Davis (2013) suggested that teachers and specialists should consider the basic nature of communication acts of children with little or nonverbal communication skills when selecting appropriate interventions. Therefore, there is a need to help special education teachers find and use effective interventions that increase functional communication skills for their students' with ASD.

Background

Local districts may have a variety of AAC devices at their assistive technology department available for special education teachers and specialists to examine possible interventions. For example, Go Talks, Dynavox, PRC, iPads, speech generating devices, text to speech, and many software programs like Boardmaker, and PODD, are some of the devices available in one Northern California district for special education teachers and specialists to use in their autism classes (personal communication, April, 2016). Odom, Cox, and Brock (2013) drew attention to the importance of ensuring high-quality special education services for ASD students in schools.

Changes in legislation the Individuals with Disabilities Education Act, Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act

Legislation has impacted social acceptance (Fowler, Hulett, & Kieff, 2011). The Individuals with Disabilities Education Act (IDEA, 2004) and the No Child Left Behind Act of 2001 mandated the use of evidence-based practices for public school teachers working with students identified as ASD (IDEA, 2004). Yet district administrators and special education teachers face many barriers that impact the successful implementation of a program, even with the use of evidence-based practices. Despite the access, teachers may have to ASD interventions and strategies, Dingflelder and Mandell (2011) cautioned, "that efficacious interventions for ASD students are rarely adopted or successfully implemented in public mental health and educational settings" (p. 597). Attempting to explain the disconnect, researchers found that special education teachers working with ASD students experienced difficulty with understanding evidence-based practices and may not possess adequate training to effectively implement the interventions (Barnhill, Polloway, & Sumutka, 2011; Dingefelder & Mandell, 2011; Low & Lee, 2011; McCullough & Martin, 2011).

Without appropriate knowledge and training in the implementation of functional communication strategies, special education teachers in public school settings may not have the support and tools necessary to effectively implement an intervention. Teachers' skill-sets, the availability of resources, time to implement a program as designed, as well as the teacher's perceived barriers to the implementation of an intervention, are all areas which need to be addressed by administrators (van der Meer, 2012). Kasari and Smith (2013) detailed the challenges schools face in adopting and implementing current interventions, noting specifically that common barriers are related to the particular

characteristics of the intervention, the manual directions, and broader contextual factors. The authors also reported that most intervention research is not conducted in school settings, suggesting that the interventions may require highly trained staff. In their discussion of Rogers' (2010) diffusion of an innovation model, Dingler and Mandell (2011) detailed three of Roger's attributes of an innovation contributing to the perspectives of school district administrators' adoption of new programs: relative advantage, compatibility, and complexity. Although programs may be made available to a school district, school district administrators can experience numerous challenges when faced with the task of selecting an effective functional communication skills intervention program. As a result, students with autism may not receive effective communication skills training to access and utilize their communication skills in their classroom.

Moreover, special education teachers require high-quality training to understand the social, behavioral and communication deficits of individuals with ASD to effectively implement functional communication interventions. The National Assessment of IDEA Overview (2011) reported that 46% of school districts were unable to find qualified teachers to teach with students with ASD. Special education teachers can function as change agents and leaders in the effort to offer high-quality, effective programs to students with ASD. However, continued research is needed to assist special education teachers in surmounting the myriad challenges they encounter supporting their students' daily use of functional communication skills in the classroom. Educators may have some strategies and interventions available to them to foster social interactions and functional communication skills of students with ASD (Oakley, Howitt, Garwood, & Durack,

(2013). Still, work by Koegel et. al (2012) indicated the need for more information on research-based practices in light of the particular challenges involved in teaching students with ASD. Researchers cited a lack of evidence-based ASD interventions and related programs available to date for school district adoption students (Costley, Clark, and Bruck, 2014; Detrich & Lewis, 2013; Dingfelder & Mandell, 2011; Kasari & Smith, 2013; Stephenson, Carter, & Kemp, 2012). McCullough and Martin (2011) also contend that more evidence-based ASD interventions are required to support special education teachers in building the behavior, communication, and foundational social skill that may enable students with ASD to engage better academically.

Problem Statement

Special education teachers experience a host of barriers to the successful implementation of communication and behavioral interventions for students with ASD in their classrooms (Charman, 2010). Teachers may face complex instructional challenges when teaching students with ASD (Ruble, Dalrymple, & McGrew, 2010), or may lack preservice training (Calculator, 2009; Costigan & Light, 2010; Crema & Moran, 2012; Fishman, 2011). Further, limited resources or a lack of buy-in from district administrators and special education teachers may also interfere with the implementation process (Dingler & Mandell, 2011; Fields, 2015).

Past research addressed the difficulties for special education teachers involved in the teaching of communication skills with ASD students (Baxter, Enderby, Evans, & Judge, 2012; Mancil & Bloom, 2010; Marder & Fraser, 2012), but there is limited research on how to help special education teachers overcome barriers to implementing

functional communication skills innovations. Calculator (2009) reported that available resources for special education teachers are critical for effective practices of AAC implementation. Bruce, Trief, and Casella, (2011) explained that more time is needed to learn high-technology AAC implementation. Research has revealed difficulty with special education teachers understanding and integrating new technology ((Fager, Bardach, Russell, & Higgenbotham, 2012b). These barriers need to be addressed to gain more information to increase the diffusion of innovation.

In the case of one Northern California school district, special education teachers and specialists were experiencing challenges with their students' lack of utilizing effective functional communication skills (personal communication, April 15, 2016). This district reported recent increases in their population of students with autism, of 662 and 84,718 in 2013 (California Department of Education [CDE], 2013). Also, a special education principal for self-contained ASD classrooms in this district shared that some students are not utilizing their functional communication skills to express their feelings, wants, and needs (personal communication, April 15, 2016). One special education teacher emphasized her interest in having more opportunities to learn best practices for teaching functional communication skills. Within this local school setting, there are students with ASD who are not consistently using functional communication skills despite their exposure to relevant functional communication skills interventions. Bruce et al. (2011) reported the following general barriers related to the implementation of any AAC system: (a) adult implementation errors, (b) protocol, (c) more time for the student to learn, and (d) early resistance of adults teaching AAC. Conditions that can promote

change based on participants' perceptions of their ASD students not being able to utilize AAC in classrooms were established. Therefore, special education teachers reported when their ASD students became frustrated or angry there was a decrease in their functional communication skills. The special education teachers noted ASD students were acting out their feelings with tantrums, screaming, hitting, and self-injuries.

Ely's (1978) conditions for change theory were used as the framework for the proposed study. The findings could facilitate successful AAC implementation and the use of functional communication skills among students with ASD by illuminating the conditions that special education teachers and specialists perceive as contributing to their acceptance, desire, and willingness to create change. According to Walker and Snell (2013), previous research studies demonstrated the association between communication and challenging behaviors applying AAC strategies. These authors concluded that effective implementation of AAC interventions had a positive effect on challenging behaviors (2013).

The findings in my study revealed factors that impacted the implementation of AAC interventions for students with ASD at the local setting. Special education teachers expressed conditions needed to implement an AAC intervention: a perceived need for more time, resources, knowledge and skills, and investment from stakeholders. A proactive approach was developed to determine what conditions for change are needed to assist students utilizing AAC in their educational settings. Conditions that could promote change were based on the participants' perceptions.

Purpose of the Study

Research showed that special education teachers working with ASD students encounter barriers to successfully implementing AAC devices and services in the local setting (Baxter et al. 2012; Fields, 2015; Kucharczy et al., (2015). Supporting special education teachers' effective AAC implementation is vital as students with limited communication skills need robust functional communication skills to participate fully within their various communities (Fields, 2015).

Many students with ASD were not using functional communication skills to communicate their needs, wants, and feelings in the classroom setting despite having access to AAC systems (personal communication, April 15, 2016). The purpose of this study was to explore how special education teachers across one school district perceive barriers to the process of implementing AAC interventions to students with ASD.

Research Questions

In order to better understand special education teachers' experiences with AAC implementation and usage, the following research questions guided this study:

1. How do special education teachers describe their experiences with the AAC implementation process?
2. What challenges do special education teachers perceive with AAC usage among students with ASD in their classrooms?
3. How are conditions for change being met in support of teachers' implementation of AAC interventions?

Chapter 3 provides a detailed explanation of the methodology that was used in this study.

Conceptual Framework

The adoption of a new AAC innovation at the district level requires educators, specialists, and other school staff to make accommodations to effectively implement the innovation. Ely (1978) explained that there are eight specific factors that contribute to the successful adoption of an innovation by educators. He explained that all eight conditions did not have to be met, but should be considered for the effective implementation of an innovation. Ely (1990) stated that there are eight conditions that foster change including (a) dissatisfaction with status quo, (b) knowledge and skills, (c) time, (d) resources, (e) rewards or incentives, (f) participation, (g) commitment, and (h) leadership. Applying Ely's (1978) conditions to public education poses the following questions when considering how to encourage individuals to accept the adoption of an innovation within a school setting:

- If individuals are not feeling successful, then will a change improve the situation?
- Do participants have or need to acquire the knowledge and skills for the adoption and implementation of an innovation?
- Are time and resources allocated by school leaders and staff to encourage individuals to change their present innovation?
- What rewards or incentives are present to create change?
- Do individuals feel their participation along with other team members are expected, encouraged, and is important for adopting an innovation?
- Are individuals supported by school and district leadership?
- Do district administrators, school leaders, and school staff demonstrate a commitment to adopting an innovation?

Ely's (1978) conditions that contributed to the adoption of an innovation framed the analysis of data for my study, offering a lens through which other educators may learn from the experiences of these district specialists. These perceived experiences identified what conditions for change are not being met in the local setting, and which support the teachers in the implementation of AAC interventions.

The Nature of the Study

The proposed qualitative study utilized a case study approach to explore special education teachers' perceptions of AAC implementation and usage. Lodico, Spaulding, and Voegtle (2010) explained, a case study "endeavors to discover meaning, to investigate processes and to gain insight into an in-depth understanding of an individual, group, or situation" (p. 269). A case study methodology allowed me to compare the AAC implementation process across different sites within one Northern California School District. Purposeful sampling (Lodico et al., 2010) was used to select participants who currently teach students with moderate to severe ASD.

Data from in-depth interviews were collected over the course of 1 month. Semistructured interviews were conducted with each participant, which provided a flexible structure that accommodates both open-ended items and comparison across respondents, as well as opportunities for possible follow-up questions. The duration of the interviews was approximately 45 minutes, and the audio-taped data were transcribed and reviewed for accuracy. The interview protocol focused on special education teachers' experiences with implementing functional communication skills interventions for their students with ASD. Specific protocol items covered teacher education, functional

communication training, student communication, intervention strategies, perceived successes and challenges with AAC implementation, and interest in learning new interventions.

During the data collection phase, participants kept a daily work journal for a three-week period. The participants focused their journal entries on their daily challenges and successes teaching functional communication skills using AAC interventions. The journal entries were coded and analyzed using thematic analysis. The transcribed interview data were subjected to a similar process of thematic analysis through which themes were identified, coded, and provisional categories will emerge. Common themes were analyzed for evidence of Ely's conditions for change to identify how current implementation efforts address these conditions.

Operational Definitions

Augmentative and Alternative Communication (AAC): Any form of communication other than oral speech (American Speech-Language-Hearing Association (ASHA, 2013). Communication which includes gestures, sign language, pictures, speech generating devices, or written communication (ASHA, 2013).

Autism Classroom: An educational setting primarily consisting of students on the autism spectrum that utilizes specific research-based approaches that have been proven effective for students with ASD, (National Research Council, Committee on Educational Interventions for Children with Autism, 2001).

Autism Spectrum Disorder (ASD): ASD and autism are both general terms for disorders of brain development (American Psychiatric Association, 2013). These

disorders vary in different degrees, with weaknesses in verbal and nonverbal communication, social interactions, and repetitive behaviors (American Psychiatric Association, 2013). Autism spectrum disorders were combined into one umbrella diagnosis of ASD in the DSM-5 diagnostic manual (2013). In the past, autistic disorder, childhood disintegrative disorder, pervasive developmental disorder-not otherwise specified (PDD-NOS) and Asperger syndrome, were considered subtypes of autism. (American Psychiatric Association, 2013).

Functional Communication: Any Behavior including personalized movements, gestures, verbalizations, signs, pictures, words, and augmentative and alternative communication devices that express an individual's needs, wants, feelings, and preferences that others can understand regardless of context or familiarity with the speaker (ASHA, 2013)

Assumptions

An assumption for this study was that participants would answer all interview and follow-up questions honestly. Additional assumptions were that special education teachers had an understanding of their students' functional communication skills in their classroom, and it was assumed that participants who currently worked with children diagnosed with ASD in their classroom understood the theoretical and practical meanings of functional communication skills.

Scope, Limitations, Delimitations

The scope of this qualitative study focused on special education teachers' implementation of functional communication skills for students with ASD. This study

evaluated the perspectives, views, and experiences of special education teachers in a California School District. Limitations of this study included a small number of participants. Therefore, the results of the study are not generalizable or transferable to larger populations because of a small sample size. Transferability was enhanced, however, by a clear and detailed description of the research context.

Delimitations included specific areas not intended to be examined in this study. The interviews did not include the perspectives of other staff members and specialists who implemented functional communication skill innovations in the school district. Furthermore, the setting was limited to special education teachers and elementary age and secondary school students with ASD, omitting other general education settings students from consideration.

Significance of the Study

Plavnick, Sam, Hume, and Odom (2013) argued that students with ASD experience deficits in functional communication and social skills that can negatively impact their relationships, academics, independence, and employment opportunities. Practitioners need to have access to research-based education, supports, and resources about how best to implement AAC classroom innovations to serve better their students. This study provided greater insight into the challenges around successful AAC implementation in the classroom. By offering a deeper understanding of the barriers to implementation, policy makers and local administrators may utilize the findings to better respond to the needs of special education teachers working with ASD students. Furthermore, the results of this study were used to inform to provide educators and policy

makers with deeper insight into those conditions critical to fostering effective AAC implementation practices. This significance section was organized into the potential impact of the study on the students, parents, teachers, schools, and the community.

By offering a deeper understanding of the barriers to implementation, policy makers and local administrators may utilize the findings to better respond to the needs of special education teachers working with ASD students. Furthermore, the results of this study can be used to inform to provide educators and policy makers with deeper insight into those conditions critical to fostering effective AAC implementation practices, as framed by Maslow's (1968) hierarchy of needs. If educators have better tools to aid in the development of their ASD students' functional communication skills, students will be better able to communicate their needs such as hunger, thirst, exhaustion, or illness (physiological); concerns, desires, and need for reassurance and support from others (safety); communicate their feelings, develop social skills, and create meaningful relationships (love and belonging); obtain satisfaction with learning and social rules of society and feelings of fitting in with society(esteem); self-development of abilities, ambitions, and interests, and self- fulfillment of growth need (self-actualization); self-transcendence (self/ego transcended to others) (Koltera & Rivera, 2006). Since students with disabilities such as ASD may not be living according to their values and realizing their potential, they need help in overcoming their needs and attitudes to reach self-actualization (Yahaya, 2011). Transcendence is the highest form of the hierarchy identifying with something greater than their individual self (Koltko-Rivera, 2006). According to Maslow, few people reach the level of self-actualization and transcendence

(Yahaya, 2011). Individuals with ASD with functional communication skills would be better prepared to participate with others in society.

Summary

Special education teachers may experience challenges in supporting the development communication skills in their students with ASD**.** A lack of functional communication skills impacts ASD students' ability to express their wants, needs, and feelings, as well as their ability to have their needs met (Fields, 2015). The purpose of this study was to examine the nature of AAC implementation across one local district.

The next chapter, Chapter 2, consists of a review of the literature. The chapter included research to date, how new research will add to the knowledge base, and how the review can be used to justify the need for this study (Randolph, 2009). Chapter 3 outlined of the study methodology, including the selection of the research design, ethical considerations, and the role of the researcher, participant selection, and data collection and data analysis.

Chapter 2: Literature Review

This chapter consists of a review of autism spectrum disorder, its prevalence in the United States, and the impact on schools. Legal requirements such as IDEA of 2004 and the No Child Left Behind Act of 2001 (Fowler et al. 2011), and the increased demands on schools to provide appropriate services for students with ASD will be presented. Functional communication skills among students with ASD, types of classroom interventions, and common challenges to the implementation of effective interventions were examined. Ely's conditions of change theory (1990) were introduced as the conceptual framework for this study. Finally, the chapter was comprised of a review of barriers and potential solutions to effective AAC implementation, implications of this study, and the rationale for the study's research methodology.

Literature Search Strategy

The following databases were used to for the review of the literature; Education Resource Information Center (ERIC), EBSCO (Elton B. Stephens Company), Education Research Complete, Sage and Google Scholar. Key terms included; *individuals with autism spectrum disorder (ASD), special day classes for students with ASD, interventions for ASD students, innovation, evidenced-based interventions for students with ASD, alternative and augmentative communication (AAC) interventions and implementation for increasing functional communication skills,* and *special education teachers' education and training ASD students*. Search limit setting was set requiring the findings to 2010 and 2015. However, additional key studies were identified earlier than 2010.

Conceptual Framework

Ely's (1978) theoretical framework for change was utilized for this study to address special education teachers perceived barriers to implementing for adopting functional communication skills interventions. Ely (1990) proposed a need for investigating the influence and innovation based on the existence and the strength of conditions that facilitate implementation. He argued that researchers must look at the environment to determine what variables can help promote change (Ely, 1998). For example, are there consistencies among the facilitating conditions from innovation to innovation and from place to place?

Ely (1990) underscored the importance of knowledge and skills in the process of implementing change. Teachers can acquire knowledge and skills in numerous ways, including assistance through peer tutoring (Ely, 1990). Ely further argued that an inventory of these conditions and their relative strength may indicate areas for improvement or potential problems in implementation. Ely (1998) concluded that there is no magic formula for identifying issues in implementation that exists and the strength of conditions.

The purpose of this study was to determine how special education teachers perceived barriers to the successful implementation of AAC interventions and devices for students with ASD. Ely's conditions for change were utilized to determine which conditions are impacting the process change process are present or not present across school settings. The literature reviewed in this section indicated special education teachers encounter numerous barriers to implementing effective interventions for students

with ASD. For the purposes of this study, these barriers were framed through the lens of Ely's eight conditions for change. Using this framework, I explored what factors may act as barriers for special education teachers in their implementation of effective functional communication skills strategies. These factors included dissatisfaction with the status quo, sufficient knowledge, and skills, availability of resources, availability of time, reward or incentives, participation, commitment, and leadership (Ely, 1978, p.159-161).

Dissatisfaction with Status Quo

Ely's (1978) first condition for change was concerned with feelings of dissatisfaction with current conditions and the expressed needs for improvement and change. Dissatisfaction with the status quo is a disruption if an innovation has observable results and if the benefits may exist. Brown (2008) stated "barriers included resistance to change, lack of stakeholder support, poor motivation, satisfaction with the current context, and insufficient methods" (p. 18). Special education teachers, other specialists, and administrators expressed they are not satisfied with their current intervention or its results.

Knowledge and Skills

Ely's (1978) second condition for change is related to the individual use of the intervention. The user's knowledge and skills need to be present to implement change. These conditions are linked to resources, rewards, leadership, and commitment. Brown (2008) reported that possible barriers may be attributed to poor instructional design and methodologies; the adopters' perceptions; attitudes; fear; relevance and poor self-efficacy; and motivation. Without the knowledge and skills of AAC interventions special

education teachers may experience difficulties with effective AAC implementation. ((Baxter, Enderby, Evans, & Judge, 2012). Also, Zangari, (2012) reported that general education teachers and special education teachers may be underprepared and have insufficient knowledge in AAC implementation.

The literature reviewed indicated a general lack of knowledge, skills, and competency among special education teaching students with ASD. The research cited the nature of preservice training and the pressure placed on educational systems to prepare qualified special education teachers and specialists to teach students with ASD (Barnhill et al., 2011; Barnhill et al., 2014; Costigan & Light, 2010; Hendricks, 2011). Therefore, there is a growing need for preservice preparation of special education teachers in institutes of higher education (IHE).

Morrier, Hess, and Heflin (2011) investigated educators' characteristics and their professional development for teaching students with ASD. These authors developed the Autism Treatment Survey to examine an individual's characteristics including the level of education, the length of teaching experience and use of evidence-based practices. Fewer than 20% reported they learned the implementation of an evidence-based practice EVB practice through their pre-service education and received training attending workshops (Morrier et al. (2011). The authors contended, "Education levels, years of experience, and grade level did not contribute to the type of training received" (Morrrier, Hess, & Heflin, 2011, p. 129). Overall, Morrier et al. (2011) reported that educators and specialists receive specific training to increase their knowledge on EVB AAC interventions.

Specific education and training related to implementing communication skills interventions were determined to be essential for special education teachers (Gulec-Aslan, 2013; Hughes et al., 2012; Wei et al., 2014). Special education teachers working with ASD students need autism-specific training and should be able to demonstrate mastery of classroom methods. In Barnhill et al., (2014), a study on professional development, the researchers reported an increase in the number of preparation programs for educators working with students with ASD since their earlier study in 2010. However, it was found that the IHEs embedded the topic of ASD in their courses, rather requiring a stand-alone course in ASD (Barnhill et at.) Also, the required hours of field experiences were varied and indicated a need for an increase through the IHE providing programs (Barnhill et al.) The authors also stated that schools with ASD programs increased their offerings on effective strategies (Barnhill et al.). Similarly, Ergul, Baydik, and Demir (2013) concluded that their participants reported a need for in-service training in speech and language, communication, autism, classroom management, and academic skills. Hendricks (2011) surveyed special education teachers teaching this population regarding their characteristics and knowledge. The findings indicated a wide variety of educational qualifications, as well as low to intermediate levels of knowledge of ASD, effective instructional practices, and implementation of effective practices (Hendricks, 2011). Hendricks concluded from his data that special education teachers were not implementing evidence-based strategies at a satisfactory level.

Availability of Resources

The third condition is a need for resources to implement an innovation (Ely,

1990). These resources are related to the interventions, teaching supplies, funding, and support from consultants. With the increased legal requirement to adopt evidence-based practices, educators must have access to more effective interventions and AACs. Also, AAC applications for teachers working with ASD students have resulted in an increased need for funding of training, as well as for specific devices. Dingfelder and Mandell (2011) summarized that administrators have the responsibility of selecting available interventions, and then determining the feasibility given the available resources. Educators need resources allocated by administrators to become prepared to effectively teach students with ASD in educational settings. Therefore, ASD students could become more able to functionally communicate with the use of AAC interventions.

Availability of Time

Ely's fourth condition (1990) addressed how individuals involved in a change process require quality time for learning interventions and implementing interventions. This is critical for special educators and specialists, who must be able to attend professional development training and be afforded the time to collaborate with other specialists as well as family members (Baxter et al., 2012; van der Meer, 2012; Suriopolou-Deli et al., 2012). Time should also be available for continuous education (Baxter et al., 2012; Kramlich, 2012). The lack of time is also described in additional research (Bruce et al., 2011; Calculator, 2009; Calculator & Black, 2010; Iacono & Cameron, 2009).

Furthermore, Baxter et al. (2012) discussed a need for time to provide training for school staff, and that working practices such as teamwork could positively influence the

functional use of a device, with ongoing advice regarding technical issues. Suriopolou-Deli et al., (2012) concluded it is crucial for teaching personnel to be appropriately trained for teachers with relevant specialized education to be in a better position to select and structure their educational goals. Additionally, special education teachers need quality time to collaborate, trial, adapt, and reflect on the use of AAC interventions with students with ASD.

Existence of Rewards or Incentives

The fifth condition for changes is a reward given for making a change (Ely, 1978). Rewards or incentives may include bonuses, paid days off, and salary increases. Since these rewards are not evident in most public-school systems, the incentives for special education teachers are intrinsic rewards (Ely, 1978). Such intrinsic rewards may include improvement in their students' ability to functionally communicate with peers, family members, and teachers. Bruce et al. (2011) explained that intrinsic rewards for the student's success and progress surpasses the special education teacher's resistance to change, lack of confidence or knowledge of AAC. Bruce et al.) stated: "student success motivated teachers to use the symbols [AAC] in the future" (p. 178). Stoner, Angell, and Bailey (2010) reported that teachers, speech and language pathologists (SLP)s, and family members would be at risk for abandoning the use of AAC if it was not successful or rewarding for them. Educators would receive rewards or incentives when their student's experience successes in academics skills and ability to functionally communicate.

Participation

The sixth condition is participation from administrators, special education teachers, specialists (SLP and occupational therapist (OT), staff members and family members, and the individual with ASD. Ely (1978) explained that complete participation of individuals is necessary to implement change. When individuals become involved in making decisions in an innovation, they all will become stakeholders. Researchers have indicated that participation by all stakeholders is needed to implement interventions (Baxter et al., 2012; Bruce et al., 2011; Stoner et al., 2010). Communication involving stakeholders, administrators, special education teachers, support staff and anyone affected by an innovation will increase the success of participation.

Commitment

The seventh condition for change was related to the support and commitment from anyone involved and affected by an innovation, such as key stakeholders (Ely, 1978). These individuals may include administrators, special education teachers, specialists, staff, and family members. These participants need to commit to the interventions adopted in the local setting. A lack of participants and commitment at all levels can create barriers to implementation of interventions for students with ASD (Stoner et al., 2010). Bruce et al., (2011) reported that the top barrier to AAC success was the resistance of adults to participate. Overall, participants' commitment should be continued with the goals and plans for implication of AAC interventions for students with ASD.

Leadership

The last condition for change was leadership. Ely (1990) defined leadership in regarding support from individuals working with users of innovations and providing financial support. In education, leadership can come from federal and state policymakers, district superintendents, administrators, board members, school principals, and specialists. School administrators have a critical role in the implementation process (Fields, 2015). Special educations teachers depend on administrators to facilitate training, foster collaboration among staff members, and provide the resources and time necessary for meeting their needs as they work to serve effectively students with ASD. Researchers support the importance of leadership to provide for staff time, training, and funding (Alquranini & Gut, 2012) Special education teachers could become more effective in AAC implementation with ASD students with continued leadership support.

Relationship Between Conditions

Ely's eight conditions do not need to exist in sequential order, but the interrelationships of these conditions can impact the success of the change process. The literature has indicated an interrelationship between these eight conditions (Ely 1999). Ensminger (2001) provided perceptions of the relative importance of conditions that summarized the interactions of Ely's conditions and linkages:

> Commitment is a sign of leadership that fosters participation from all stakeholders and influences status quo, which indicates a willingness from leadership to provide training (an issue of time and support), resources and incentives which in turn encourages continued participation, increases user

> skills/knowledge, thereby improving self-efficacy and creating a sense of value for the product. (p. 52-53)

Furthermore, each component affects the success of educational change. Ely (1990) discussed how all eight conditions of change might not exist in the change environment. He added "The absence of any condition will probably reduce the effectiveness of the implementation process, and the goal is to attain each of the eight conditions during the implementation process" (Ely, 1990, p. 301-302). Researchers have identified several conditions needed for the successful implementation of effective ASD-related interventions. GRULAC- Aslan (2013); Bishop, Brownell, Klinger, Elko, and Gilman (2010); and Hendricks (2011) each discussed the necessity of special education teachers' knowledge and training to become effective with ASD students. Ely's conditions are broadly related to time, knowledge, and available resources. Legal requirements ensuring evidence-based interventions for individuals with ASD, and the general need for effective ASD strategies suggest conditions requiring leadership, commitment, and resources.

Literature Review Related to Key Concepts and Variables

Defining ASD

ASD is considered a complex neurobiological disorder related to restricted and repetitive behaviors, impairments in social interactions and communication skills (Russia, Matthews, & Owen-Descrier, 2015). Individuals with ASD exhibit differences in intellectual abilities and impairments in sensory and motor skills (Turn ball, Turn ball, & Wheeler, 2012). Autism is considered a triad of autistic disorders including autism, Asperger syndrome, and pervasive developmental disorders not otherwise specified

(Hirata et al., 2015).ASD is described as a continuum based on the severity of autism characteristics presented. The autism spectrum was described by Wing (1993) as an absence of clear boundaries among the forms of autism (Hayes & Watson, 2013).

The Centers for Disease Control noted that one in 88 children is now being diagnosed with ASD (CDC, 2014). Recent research also indicated an increase in the number of identified nonverbal ASD students in the U.S. (Sandiford, Matiness, & Dasher, 2013). The CDC data were collected by the ADDM network that analyzed ASD evaluation records and screenings of children from birth through eight years old at different sites within the United States (Banda, Griffin-Shirley, Kong, Got, & Meeks, 2014). Marder and deBettencourt (2012) stated since the ASD disability category started in 2001 with the reauthorization of IDEA, the number of students receiving special education services for the category of ASD has increased.

Researchers have debated the different causes for the increase of ASD in the past 30 years, including greater awareness of ASD among professionals, parent awareness of ASD, improvement in diagnostic practice, environmental causes, genetic causes, and reclassification of the disability (Banda et al., 2014; Thompson, 2013). Russell, Kelly, and Golding (2009) attributed three reasons for the increased diagnosis of ASD including autism as a syndrome including milder conditions, younger children being diagnosed with ASD, and increased awareness by parents. Thompson (2013) added that the Diagnostic Observation Schedule (DOS) (Lord et al., 1989) and the Autism Diagnostic Interview-Revised (ADIR-R) (Lord et al., 1989) distinguished individuals with ASD from other developmental disorders and mental health conditions before 2 years of age.

Kaufman and Silverman (2010) stated that diagnostic practices increased the diagnosis of ASD and that atypical brain development and genetics are causes of ASD. Similarly, Lundstrom, Haworth, Crlstrom, Gillberg, and Mill (2010) noted genetic causes are increasing the risk for ASD due to a strong association between paternal age and Fragile X Syndrome. Researchers have noted different causes for an increase in the number of individuals identified with ASD (Thompson, 2013; Russel et al., 2009; & Banda et al., 2014). The increase in ASD identified individuals impacted school leaders, educators, specialists and family members.

Research on ASD and Public Schools

The Individuals with Disabilities Education Act (IDEA) of 2004, and the No Child Left Behind Act of 2001 required public schools to implement research-based practices in the least restrictive environment (LRE) possible for equal educational opportunities for students (IDEA, 2004, 300.347 [a][l][i]). Olson, Roberts, and Leko (2014) explained that the IDEA Act defined LRE as access to "the same curriculum as for non-disabled children" (p. 1). However, they noted how the specifics of where, how, and who should provide access were not defined" (p 1). Thus, educators may adopt their interpretation of what it means to provide students with ASD equal access to general education curriculum.

The LRE is considered the general education classroom with a general certified teacher. Koegel et al., (2012) argued that, given the legal requirements for using research-based interventions in the LRE and challenges involved teaching students with ASD, there is a growing need for greater research on the implementation of interventions

appropriate for use in inclusive settings. The difficulty of providing effective special education services for individual students with ASD is compounded by the question of where to provide these services (general education classes, special education classes, or separate special schools). Barnhill et al., (2014) reported that the U. S. Department of Education found that in 2011, 29.1% of ASD students were served in general education classes at least 79% of the time, another 17.4% were in general education classes between 79% to 40% of the day, 41.8% were in separate classes, at least 60% the time, and 11.5% were in separate schools.

In light of the legal requirements for educating ASD students using research-based practices in LRE settings, public school systems are challenged to provide an equal educational opportunity to ASD students within the general classroom under the supervision of often undertrained general education teachers (Liacono & Valenti, 2010). According to a National Research Council (NRC) report by the USDOE Office of Special Education Programs (OSEP) (2001), one of the most significant challenges for school districts is hiring appropriately trained staff to provide effective services for students with ASD (Hendricks, 2011).

Evidence-Based Interventions and Practices

Educators and administrators working with ASD students are faced with the challenge of providing evidence-based interventions in school settings. According to Fowler et al., (2011), the Individuals with Disabilities Act and Section 504 of the Rehabilitation Act of 1973 had a significant impact on the educational rights of students with ASD. Educational rights for children with disabilities IDEA include the following 6

principles: zero reject-free and appropriate public education and receive individualized services; non-discriminatory evaluation-socioeconomic factors and language do not bias assessments; appropriate education individualized education benefits the child; least restrictive environment-justify why the child is not participating in the general education curriculum; procedural process-parent or student is entitled to a due process if they do not agree with the IEP (Boyd & Shaw, 2010). Also, recent legislation requires educators to implement research-based interventions to increase the social and communication skills of ASD students (Fowler et al., 2011).

Evidence-based interventions are required to be implemented by general education teachers, special education teachers, and other school staff in either inclusive classroom settings or self-contained special day class settings in public schools. Odom et al. (2010) defined evidence-based practice (EBPs) as an intervention that has been tested in high-quality research with students who are similar to the target students such as diagnosis, intellectual ability level, and language levels. Odom et al. (2010) identified 24 EBPs focused interventions that met the criteria established for EBP. Furthermore, the authors provided additional evidence for guidelines and methods for implementation of practices into educational settings for learners with ASD.

Several researchers have noted the challenges encountered by school personnel in providing the required effective interventions (Hughes, Kaplin, Berstein, Boykin, & Reilly, 2012; Koegel et al., 2011; Stephenson et al., 2012). Such challenges included the degree to which educators and specialists understand and can implement interventions, let alone identify an appropriate evidence-based intervention for a specific individual with

ASD, and then selecting an appropriate evidence-based intervention for the specific student. Hendricks (2011) also argued that these factors impact a teacher's overall competency in teaching students with ASD.

Researchers have debated the treatment and intervention methods for individuals with ASD, and how to best educate ASD learners in the schools (Simpson, Mundescenk, & Heflin, 2011). These debates focused on the methods and standards for preparing teachers, the selection of effective strategies and the educational placement of ASD students (Messemer, 2010), and selecting educational strategies effective for ASD learners (Simpson et al., 2011). Simpson et al., (2011) presented core questions for addressing the aforementioned topics: "Who should be teaching ASD students? Where should these students receive their education? Moreover, what and how should they be taught? Researchers also reported a lack of evidence-based research regarding classroom interventions and curriculum (Clark, 2013; Costley, Clark, & Bruck, 2014; Kasari & Smith, 2013; Pelicano, Dismore, & Charman, 2013; Stahmer & Aarons (2009)). With the increased need to provide evidence-based interventions, Stahmer and Aarons (2009) and Kasari and Smith, (2013) reported a shortage of studies that examine the successful implementation of evidence-based practices for by educators of children with ASD in school settings. These authors reported several barriers to providing quality implementation such as; incompletely developed interventions, limited evidence of effectiveness that indicated long-term use and meaningful change, and poor fit in school settings.

Hughes et al., (2012) reviewed several studies to identify effective strategies for increasing social communication skills of ASD students in secondary schools. These authors stated that the successful daily classroom performance of secondary students with ASD was dependent upon their communication and social interaction with teachers and peers. Limited effective social skills can impact ASD students' social interactions and social acceptance, as well as their academic and classroom performance (Hughes, 2012; Shatuck, Orsmond, Wagner, & Copper, 2011; Wei et al., 2014).

Augmentative and Alternative Communication

Individuals with ASD vary in their functional communication skills from limited verbal skills in some individuals to completely non-verbal in others. Individuals with complex communication needs (CCN) are limited in their ability to speak and use Augmentative and Alternative Communication to communicate their wants, needs, and feelings (Fager, Bardach, Russell, & Higgenbotham, 2012b). "AAC is defined as the devices, techniques, or strategies that supplement or replaces speech or written communication skills" (Beukelamn & Mirenda, 2013) as noted by Costigan and Light (2010, p. 200). AAC interventions have been implemented to increase functional communication skills for individuals with CCN.

AAC strategies have been studied since the 1980's and 1990s for their application among individuals with disabilities. Shane, Laubscher, Schlosser, Flynn, and Sorce, (2012) reported that AAC users (ASD) have numerous tool choices including low-tech tools, and special and general-purpose hardware as well as special and general hardware in combination to meet their communication needs. The earliest strategies available for

ASD individuals were low-tech, such as the use of manual signs to communicate. These strategies were followed by special purpose- low-tech AAC tools developed only for communication purposes, including non-electric communication boards. The Picture Exchange Communication System (PECS) developed by Frost and Bondy (2002) is a picture-based system that has been used extensively for individuals with complex communication needs. (Bondy & Frost, 2011).

High-tech AAC approaches to hardware and software were later developed for individuals with ASD. Portable speech generating devices (SGD) produced synthetic and digitalized speech. The many technological advances since the 1980's changed the use of AAC (Fager et al., 2012b), which lead to AAC devices in cell phones, computers, and other stand-alone communication tools. Researchers demonstrated that individuals with ASD who have complex communication needs benefited from using AAC (Gantz, Parker, & Benson, 2009; Machalick, Sanford, Lang, Ripoli, Milfenter, & Mbeseha, 2010). Light & McNaughton (2012) concluded that the evidence supports a positive impact of several AAC techniques including unaided systems (signs), aided systems (low-tech, non-electronic), and high-tech devices.

Mobile technology including apps has increased the availability of AAC's for individuals with ASD (Shane, Gosnell, McNaughton, & Sennott, 2011). As a result, individuals can purchase their own communication devices rather than waiting for AAC teams to complete an evaluation to determine the most appropriate device. These advances provided many options for families to meet the CCN needs and skills of individuals.

AAC use for individuals with ASD has also had an impact on general communication goals. Thirty to 40 years ago, the focus of interventions was on using AAC to address traditional language goals, and the effects of the intervention were measured only regarding vocabulary or mean length of utterances. With ASD individuals using more advanced AAC's, intervention goals have changed the focus to increasing functional communication as measured regarding enhanced communication effectiveness (Light & McNaughton, 2012). More recently, "there has been increased recognition that functional communication skills are themselves tools that support the individual's broader participation in society, at home or in the community-at-large" (Light & McNaughton, 2012, p. 201).

Interventions

Research on interventions for ASD student focused primarily on behavioral and social interactions, including communication skills. Odom et al., (2010) defined the differences between comprehensive treatment models (CTMs) and focused interventions. CTMs addressed a broad-scoped of skills and abilities for children with ASD. Focused interventions are individual strategies to teach specific educational targets with students with ASD. There are numerous strategies and interventions available for educators and practitioners to adopt for use in their ASD classrooms. Interventions that are commonly taught in school settings will be briefly reviewed.

Picture Exchange Communication System (PECS) developed by Frost and Bondy (2002) is an intervention teaching functional communication skills for individuals with complex communication needs. The PECS intervention was created to use picture icons,

or symbols, to promote functional communication skills in social contexts for students with ASD (Bondy & Frost, 2001). PECS is considered a low-tech AAC strategy with six phases utilizing reinforcers to teach skills in a systematic order (van deMeer, 2012).

Video modeling is another intervention focused on improving a range of skills for individuals with using a model performing target skills using video technology. Wilson, (2013) recommended that video modeling as an efficient strategy for specialists and educators to implement in the school setting.

Functional Communication Therapy (FCT) intervention addresses the communication and behavioral needs of individuals with ASD. FCT includes three steps: a functional behavior assessment identifying the function of a behavior, developing a treatment plan, and then teaching a communicative response that serves the same function of the behavior (Mancil & Bowman, 2010).

Milieu Therapy (MT) focuses on teaching children with ASD communication skills and behaviors within their natural environments using families and teachers in the home and school. There are four basic milieu procedures including; modeling appropriate responses; using a mand; time delay; and incidental teaching

Prelinguistic Milieu Teaching (PMT) is "based on the behavioral principles of ABA focusing on incorporating variables known to improve responsiveness, the rate of responding, and positive affect including child choice" (Franco, Davis, & Davis, 2013, p. 489). PMT has been used to teach social interaction skills and intentional communication skills with nonverbal school-age children with ASD.

Technology based AAC's high-tech AAC software and hardware began with portable speech generating devices (SGD) (Shane et al., 2011). IPods and iPads are currently used because they are more affordable, accessible, and socially acceptable (Kagohara, deMeer, Ramdoss, O'Reilly & Lancioni, 2013). Furthermore, applications for these devices are readily accessible and customizable.

Recent research examined EBP interventions for educators to utilize with ASD students. Koegel et al. (2012) evaluated research-based interventions implemented with ASD students in the least restrictive environment (LRE) in inclusive school settings. The intensive, comprehensive interventions focused on reducing challenging behaviors, developing communication skills, and improving social relationships. The authors summarized that teachers and school personnel required preparation to implement research-based interventions to ensure students with ASD receive effective interventions within their LRE.

Stephenson et al. (2012) reviewed the quality of information for educational and therapy interventions on websites of national autism associations. Since parents, teachers, and professionals use websites to locate educational and therapy intervention for children with ASD. They concluded that information available on the websites provided inconsistent information on the selection of current research on interventions.

Banda et al. (2014) examined eight intervention studies conducted among students with ASD and sensory impairments. They found that four of the studies focused on communication skills and four targeted behavioral problems. However, all participants demonstrated progress in communication skills and improved in behavior. Odom et al.

(2010) developed a process for reviewing the research and establishing criteria for identifying EBPs. Odom et al. (2010) described two kinds of EBP comprehensive treatment model (CTM) and focused intervention practice.

"CTMs are conceptually organized packages of practices and components designed to address a broad array of skills and abilities for children with ASD and their families" (p. 276). The authors recommended the models should be described well enough for others to replicate them and have a process for assessing the implementation. Odom et al. described a focused intervention practice as empirically based, supported, and tested in an experimental research study, with individuals who have similar critical characteristics (diagnosis, age, intellectual level, and their language level). They added that focused interventions are individualized practices and strategies teachers and practitioners use to teach specific educational skills and concepts to children with ASD.

Knowledge, Education, and Teacher Preparation

The Council for Exceptional Children (CEC) makes sure that policy issues and the needs of children with exceptionalities are in educational legislation, creates professional standards, and develops initiatives to improve special education practices (CEC-TAG | About. (n.d). In 2012, CEC revised its standards for preparation of special education teachers to ensure that entry-level special educators and special education experts have the skill and knowledge to practice safely, ethically, and successfully. The standards also called for practicing special educators to have effective mentoring. For entry to initial practice as a professional special educator, CEC expects that every candidate to have appropriate pedagogical skills, demonstrate mastery of appropriate core

academic general and specialized curricula, hold a bachelor's degree from an accredited institution, and undertake a systematic, introduction structured discipline-specific period of induction (CEC, 2014).

In addition to the critical elements mentioned above, professionals entering into initial special education practice need to receive a minimum of a one-year of mentorship during the first year (Professional Standards and Practice Policies and Positions (n.d.). The mentor must be an experienced special education professional in the same or a similar role as the individual being mentored and provide expertise and guided support on a continuing basis.

Accordingly, CEC (2014) advocated that ancillary staff, administrators and both general and special education teachers have obtained state-of-the-art knowledge and effective practices for students with exceptionalities. Therefore, access to a knowledge base of effective classroom practice is essential for programs to respond successfully to the needs of all exceptional students. There are two types of specialized programs for teacher preparation: pre- service training programs and in-service training programs. According to Teeb, Muhaidid, & Al-Zoom, (2013) special education teachers do not have sufficient courses in their teaching methods and curriculum for teaching students with ASD students included into their pre-service training.

The rehabilitation and education of students with disabilities require the specialized preparation of teachers to develop their competency and effectiveness, which requires on-going performance assessment. Teacher training preparation programs and education policy makers should ensure that special education teachers develop the

knowledge, and skills, to assist them in meeting the educational needs of children with disabilities, as well as receive professional development required to keep current with the rapid changes affecting the field of special education.

Hendricks (2011) investigated the nature of professional competencies through surveys from special education pre- service teachers around the U.S. In his study of 498 teachers, Hendricks (2011) found that additional training was ranked as the highest need for special education teachers. Results indicated there were significant differences in the training needs for special education teachers related to their years of teaching experience. Bishop, Brownell, Kilinger, Leko, and Galman (2010) examined the level of effectiveness of new special education teachers. Results demonstrated three important issues associated with the preparation and training of special education teachers: knowledge of special education instructional content; teaching reading, opportunities or practice; training and application of knowledge in the classroom; and classroom management.

Special education teachers must be trained in the implementation of strategies that develop communication skills for students diagnosed with ASD. Gulec-Aslan (2013) investigated the qualifications of educators working with ASD students and how these qualifications affect their teaching outcomes. The author found that the educator's knowledge and skills improved with a well-designed training program (2013). He recommended that well-designed teacher educator training programs in the ASD field should be focused on meeting the educator's needs and should be provided by professionals in the field.

Alahmari's (2010) study aimed to identify the training needs of teachers of students with learning disabilities. The findings indicated that the top training needs were: effective teaching methods; use of educational technology; early detection; effective communication with students and administration of official tests. Giles (2009) conducted a study with special education teachers' assistants to determine their perceptions about the relationship between training and competency. The participants ranked the following training topics by a level of importance in descending order: educational interventions; classroom management; children's behavior; disability characteristics; collaboration skills; and understanding of the curriculum (Profesional Competencies Among Pre-school Teachers in…(n.d.).

Teaching and Assessment Skills Duties and Responsibilities

Special education professionals need to be prepared to individualize their students' goals to maximize their learning, identify EBPs to meet the needs of each student's needs. Additionally, their responsibilities include using periodic assessments to measure students' progress and create a culturally effective environment.

Ethical Principles and Profesional Practices Standards for Special Educators CEC (n.d.) reported the following guidelines:

1. Systematically individualize instructional variables to maximize the learning outcomes of individuals with exceptionalities.
2. Identify and use evidence-based programs appropriate for their professional training and are effective to meet the needs of individuals with exceptionalities.

3. Use periodic assessments to measure accurately the learning progress of individuals with exceptionalities, and individualize instruction variables in response to assessment results.

4. Create safe, effective, and culturally responsive learning environments, which contribute to the fulfillment of needs, stimulation of learning, and realization of positive self-concepts (Ethical Principles & Practice Standards. CEC (n.d).

5. Participate in the selection and use of effective and culturally responsive instructional materials, equipment, supplies, and other resources appropriate to their professional roles. (Ethical Principles & Practice Standards. CEC (n.d.).

The current educational climate emphasized teacher accountability and placed high expectations on individuals with exceptionalities. As a result, it is imperative that all special educators are well prepared, career-oriented professionals who are afforded the appropriate tools which allow them to provide individuals with exceptional needs the most effective interventions (Barnhill et al., 2014; Vittek, 2015).

Special Education Teachers and ASD Students

According to McCullough and Martin (2011), there is a severe shortage of qualified teachers to teach students with ASD in the United States. They note, “In the National Assessment of IDEA Overview (2011) 46 percent of school districts reported that qualified teachers who work with students with autism” (McCullough & Martin, 2011, p. 30). Virginia and California have established basic teacher competencies and training requirements for autism credentialing. Currently, California requires new special education teachers to take courses in evidence-based autism strategies while veteran

special education teachers must take classes on autism (McCulloch & Martin, 2011). Marder and deBettencourt (2012) cited two reasons for shortages of special education teachers teaching ASD students: first, there are few qualified professionals to fill positions and; second there are deficits in state funding to support the professional development of public school teachers working with this population.

The implementation of effective functional communication skills interventions requires that teachers receive high-quality training and understand the social, behavioral, and communication deficits of individuals with ASD. The increase in students diagnosed with ASD increased pressure on educational systems to place qualified teachers with teaching these individuals (Barnhill et al., 2011; Barnhill et al., 2014; Hendricks, 2010. Barnhill et al. (2011) examined the nature and type of personnel preparation for educators working with an individual with ASD. Hendricks (2011) investigated the characteristics and self-reported knowledge and practices of special education teachers working with students with ASD. Costigan and Light (2010) reviewed the pre-service training of AAC for Speech-Language Pathologist (SLP), Special Education Teachers (SET), and occupational therapists (OTs). Barnhill et al., (2014) examined a follow-up analysis of contemporary practice for personnel preparation for special education teachers working with ASD students.

Low and Lee (2011) reported a need for educators to understand ASD deficits in their speech, language, and communication. These authors emphasized the importance of educators was becoming knowledgeable in administering methods that help students learn functional communication skills. Low and Lee explained, that teaching speech,

language, and communication skills to individuals diagnosed with severe ASD that educators need to have prior knowledge of the learning styles and behavioral patterns for these students. Hendricks (2011) also reported an increasing need for qualified teachers to teach these students, which put pressure on educational systems to provfde high-quality training. Suriopoulou-Deli et al., (2012) found that teachers' specialized training and work experience are critical for the efficient teaching of students with ASD. Teachers must be knowledgeable about educational practices for implementation of appropriate strategies based on the individual with ASD's needs. Hendricks (2011) stated, "special education teachers who work with students with autism have low to intermediate levels of knowledge to teach effective instructional practices and implementation of effective teaching practices" (p. 46). Educators working with students with ASD need to have knowledge of deficits, characteristics, and needs of students with autism spectrum disorders.

Hughes et al., (2012) reviewed several studies to identify effective strategies for increasing social communication skills of ASD students in secondary schools. Noting the research of Shattuck et al., (2011) and Wei et al., (2014), it was argued that successful classroom and everyday school performance of secondary students with ASD was dependent on their communication and social interaction with teachers and peers. Since, students with ASD have limited effective social skills, which in turn affect their social interactions, the degree of social acceptance, academic standing and classroom performance (Hughes, 2012; Shattuck et al., 2011; Wei et al., 2014).

Hendricks (2011) concluded that the professional development of special education teachers should ensure that they are ready to teach this population. Teaching ASD students include mastering knowledge about the characteristics of students with ASD, how ASD impacts learning as well as the selection and application of appropriate strategies, assessments, and data collection of this student population.

Communication and ASD

Children with ASD can have a wide degree of developmental difficulties with communication, socialization, cognitive skills, restricted interests, and motor skills (Goldstein, Naglieri, Rzea, & Williams, 20012). Magyar and Pandolfi (2012) reported that individuals with ASD often have related disorders of emotional and behavioral problems. Mancil and Bowman (2010) detailed how children with ASD exhibit tantrums, screaming, hitting, and biting. Moreover, the children's inability to communicate further complicated efforts to determine the reasons for the outbursts. These authors noted that increases in the communication of ASD students resulted in a decrease in challenging behaviors. Therefore, interventions that improve functional communication skills can help children with ASD better to express their wants, needs, and feelings.

Social and other communication deficits are core features of children with ASD and are deeply intertwined with behavioral, social and academic development (American Psychiatric Association, 2013). Individuals with autism have little or no functional communication skills, which presents challenges for their families and school staff. Communication impairments have been linked to challenging behavior and reduced opportunities for school involvement (Shattuck et al., 2011; Wei et al., 2014).

Communications Skills

Whyte, Nelson, and Scert (2014) investigated the nature of figurative language in children with ASD. Deficits in figurative language are difficulties in understanding metaphors, idioms, and humor. Kover and Weismer (2014), findings indicated that lexical characteristics are related to vocabulary acquisition and account for vocabulary delays in individuals with ASD. Lexical phrases are chunks of the language of varying length, like as it were, on the other hand, and are multi-word phrases that have idiomatically determined meaning fixed phases (Nattinger & DeCarrico, 2001; Huang & Gordon, (2011) Gordon et al., (2011) examined the form and function of spontaneous communication and outcomes of nonverbal children with ASD using a classroom-based intervention (PECS). In this study, special education teachers were trained and received consultation by the PECS's consultants. The results indicated that nonverbal students increased their spontaneous use of pictures to communicate including their development of requesting skills. Hill and Flores (2014) compared the independent use and effectiveness of two AAC interventions, one low-tech (PECS) and one high-tech iPad among elementary students with ASD. These authors concluded that teaching the low-tech PECS before using the iPad equivalent (Proloquo2GO) may be an effective progression for building communication reciprocity skills. Fields (2015) investigated the implementation of AAC's for individuals with profound expressive language disorders. The author identified a need for these individuals to express their thoughts, wants, needs, and knowledge was arguing "Communication is a critical component to meaningful

relationships and the enjoyment of life" (Fields, 2015, p. 17). Individuals with minimal or low functional communication skills can experience feelings of loneliness and isolation.

Mancil and Boman (2010) demonstrated how Functional Communication Training (FCT) consistently reduces challenging behaviors and increases communication skills, which leads to overall improvement in their quality of life in relationships, with peers and general understanding of nonverbal language. These researchers found that there was limited research on communication skills applications for students with ASD. Furthermore, they recommended that future studies should investigate types of communication and how schools are using touch-pad technology in their classrooms.

Barriers to the Implementation of Interventions

Research indicated difficulties with implementing interventions of functional communication skills for students with severe communication needs. A review of studies identifying barriers related to the implementation of interventions by special education and specialists were reviewed. There has been limited research regarding AAC interventions specifically for individuals with ASD.

Fields (2015) examined barriers related to the implementation of AAC interventions. She reported that SLPs and teachers lack the needed knowledge, experience, and the time to properly implement AAC. Also, the need for more participation and commitment from colleagues, school leaders, and students' family members were additional barriers to the successful implementation of AAC. She concluded that these factors required additional training and collaborative planning time.

Baxter et al. (2012) investigated the use of high technology interventions for individuals with severe communication needs. Their research included a systematic review of past research related to barriers of AAC interventions. These researchers reported the top barriers; ease of use, reliability, availability, time generating a message, family perceptions, support, the role of the communication partner, service provision, and staff training.

Bruce, Trief, and Cascella (2011) examined SLP's and teachers' perception of tangible symbol AAC interventions. These researchers reported specifically related barriers to AAC interventions; the early resistance of adults, physical and medical issues of children, protocol, poor attendance, non-optimal alertness states, irritability or moodiness, need more time to learn, bilingualism; and adult implementation errors**.**

Kucharczyk et al., (2015) conducted focus groups with ASD practitioners, parents, and other stakeholders to explore the contexts, considerations, and complexities with delivering interventions for ASD adolescents. The researchers reported that stakeholder input and buy-in is essential to ensure both feasibility, fit, and fidelity of intervention implementation. Also, high-quality professional development in pre-service and in-service contexts beyond single-day workshops and one-shot training could increase the frequency and quality of intervention implementation.

Summary and Conclusions

With the increased prevalence of individuals diagnosed with ASD, researchers have presented a wide variety of available interventions, and AAC for educators working with the ASD population. Diagnostic practices, required use of EBP interventions, and

legal requirements of LRE have impacted educators and practitioners teaching students with ASD. There were some barriers identified in the current research that impacted implementation of functional communication skills interventions and AAC with ASD students. More research is needed in determining what factors specifically affect special education teachers working with ASD students. Ely's (1990) conditions of change theory were applied as a framework according to sufficient knowledge, and skills availability of resources, availability of time, reward or incentives, participation, commitment, and leadership, and the dissatisfaction with the status quo. A study is needed in determining which of the factors, the combination of the factors or additional factors that impact special education teachers during the implementation of AAC in the local setting. The methodology for this study was investigated including; research design and questions, ethical protection of participants, methods for protection of human subjects, the role of the researcher, and data collection and analysis.

Chapter 3: Research Method

Introduction

The aim of this study was to increase the understanding regarding the teacher perceptions of the challenges associated with implementing functional communication skills among ASD students from the perspective of special education teachers in one Northern California School District. The following chapter provided information of the research design, case selection, setting, recruitment process, institutional review board (IRB) process, and the role of the researcher, data collection, and data analysis will be provided.

Research Design and Rationale

A qualitative design was selected for this study because it allowed for the examination of complex social phenomena across social settings to gain in-depth knowledge about local contexts, such as special education teachers' perspectives and experiences with functional communication skills interventions for ASD students (Yin, 2011). Qualitative research involves an inductive reasoning method that involves identifying themes and making generalizations from observed data to explain relationships (Lodico, Spaulding, & Voegtle, 2010). The rich and thick descriptions provided a deeper understanding of the perceptions of people. Qualitative case studies are designed to obtain the holistic and meaningful characteristics of an organization, which contributes to the knowledge of the group, social context and related phenomena (Yin, 2009). According to Noor (2008), case study methodology is an empirical inquiry examining a contemporary phenomenon. Lodico et al., (2010) explained further that case

studies are utilized to "discover meaning, to investigate processes, and to gain insight into and in-depth understanding of an individual, group, or situation" (p. 269). Yin (2009) described case study research as descriptive, exploratory, or explanatory. A researcher's activities are narrowed down to particular sites, subjects, materials, topics, and themes (Bogdan & Bilken, 2007). A case study captured a rounded picture since multiple sources of data were collected. A case study approach was chosen for the current project because it enabled the researcher to explore the AAC implementation process from the perspectives of multiple special education teachers and across different school sites within one district.

Other qualitative design approaches were considered and rejected. An ethnographic approach involves the in-depth documentation of a local community's way of life, which is not the purpose of this study (Creswell & Shope, 2012). Also, I am not attempting to investigate how social interactions of a particular group are influenced by a larger society (Lodico et al., 2010). A grounded theory approach is not applicable because I am not aiming to establish a global theory about AAC interventions to explain any singular event (Lodico et al.). A phenomenological approach was considered as a possible research design because it can help to capture an individual's subjective experience (Creswell, 2012). This design focuses on in-depth understanding of human behavior associated with an event and, therefore, is not appropriate for this study.

Role of the Researcher

I was previously employed by the host school district to provide speech and language therapy services to students with IEP's designating speech and language

therapy services. I provided speech therapy services to students in the special day classes and students with ASD as detailed in their IEP's. Given my experience with the district, I knew some of the special education teachers. Additionally, I had no supervisory role with potential participants. However, I took steps to ensure that my experiences and relationships did not influence the special education teachers' responses.

According to Brantlinger, Jimenez, Klinger, Pugach, and Richardson (2005), the purpose of qualitative research is to develop understandings based on an inductive analysis of local contexts. A researcher may present biases when collecting and analyzing data by introducing their preconceived thoughts and ideas (Long, 2012). My role was the main instrument in a naturalistic setting (Szyjka, 2012). Further, interviews can be problematic. It is imperative to remember the power relationship between the interviewer and the interviewee. The interviewer relies on the participant's willingness to discuss their experiences while the interview questions themselves can influence participant responses (Yin, 2011). I assured the participants that all involved had equal positions within the district, and my opinions and responses will not influence their work. In addition, I emphasized the importance of having them honestly express their experiences, both positive and negative, and assured them that all interviews were confidential.

Methodology

Participant Selection

Purposive homogeneous sampling was used to select participants from a pool of special education teachers working with ASD students in one Northern California school district. Potential participants included those special education teachers who held a valid

special education teaching credential, teach in the district, are 18 or older, and are currently working with or have formally worked with ASD children requiring functional communication skills interventions. A purposive, homogeneous sampling allowed me to select special education teachers who are teaching or recently taught students with ASD for a minimum of 2 years. According to Yin (2011) in selecting a small number of participants, the researcher will not be able to generalize the results to other populations. However, when selecting a large number of participants, more data was collected and analyzed by the researcher. The sample selected for this study included six special education teachers who teach of have taught self-contained classes for students with ASD for 2 years.

Instrumentation

Through the review of the literature, I found research utilizing qualitative research designs, as many featuring a case study examining functional communication skills for individuals with ASD. Additionally, there was limited research that investigated barriers to implementation of AAC for individuals with ASD. I utilized a qualitative case study research design focused on AAC intervention implementation for students with autism.

Oakley, Howitt, Garwood, and Durack (2013) utilized two case studies of classroom based teaching interventions of final year preservice teachers working with ASD children. The study used Information and Communication Technologies (ICTs) as an intervention. The first case used an iPad to improve literacy learning and support engagement for one individual (Oakley et al.). The second case used a Microsoft

PowerPoint on a laptop to investigate one child's developing literacy engagement (Oakley et al.). The researchers used their technological, pedagogical, and content knowledge, as well as specific knowledge of their students, through diagnostic assessments, and designed a specific intervention for the children. Data and results were from observation and data summative assessments. Both case studies demonstrated that the creation of multimodal texts (using ICTs) supported the learning and engagement of children with autism (Oakley et al., 2013). Classroom based interventions for ASD students should be selected based on each student's ability, and needs.

Rovira (2014) used a qualitative approach drawing upon interviews with teachers about their experiences instructing students in positive social behavior within the inclusive classroom. The teachers participated in individual, 30-minute open-ended interviews about their experiences in instructing ASD students in positive social behavior (Rovira). The findings indicated when ASD students are placed in an inclusive classroom their social behavior improved by being in a natural setting (Rovira). Additionally, general education students learned as empathy they often had to display good character when interacting with a student with autism in their classroom (Rovira, 2014).

Research specifically focusing on barriers and facilitators of AAC for students with severe communication impairments was reviewed in the literature. Baxter et al. (2012) synthesized data from qualitative and survey studies from 2001-2010 on the views and perceptions of staff providing AAC devices. Nineteen of the studies included interviews with teachers and family. Roviera (2012) recommended that practitioners should be aware of the barriers and promoters for successful use of AAC interventions.

Therefore, AAC interventions should be selected specifically to meet the needs of a student with ASD.

Stoner et al. (2010) used a case study methodology to describe perspectives of an educational team regarding the AAC implementation with a 12-year-old student. These researchers interviewed all participants and evaluated academic and personal records of the student's educational and AAC experiences (Stoner et al., 2010). The results indicated "limited team cohesiveness, problem-solving, and communication as true barriers in this case" (Stoner et al., 2010, p. 122). My study utilized interviews and work journals from special education teacher to understand their perspectives on AAC interventions with students diagnosed with autism spectrum disorder.

Additional research was reviewed that included Ely's (1978) condition for the change process. This review of the literature did not reveal Ely's conditions for change framework used specifically for the ASD population. However, the implementation of AAC use in technology was reviewed (Ely, 1978; Ely, 1990). Ely reported that conditions should be investigated to implement technology in schools. Technology has been used for AAC interventions implementation with ASD students in educational and home settings. New research could facilitate successful AAC implementation and the use of functional communication skills among students with ASD. The conditions for change perceived by special education teachers and specialists could contribute to their acceptance, desire, and willingness to create change.

Schaeffer and Kim's (2012) case study included a healthcare provider team, a health care information technology team, and a university research team that all

collaborated to develop and implement an e-health learning system. Ely's (1990) condition for change model assisted in the study participants' identification of issues, limitations, and constraints in their environment need to be considered in the development and implementation of the innovation. Colley (2012) used Ely's condition for change as their framework to examine a learner-centered approach to teaching philosophy in a school of nursing. Faculty members were interviewed and responded to narrative questionnaires regarding their perspectives on learner-centered philosophy (Colley, 2012). Thematic analysis of the data revealed 20 themes within five categories. The findings indicated the availability of time and resources were important for the process of change for a learner centered teaching approach in the nursing program.

Procedures for Recruitment, Participation, and Data Collection

For this study, potential subjects were selected through homogeneous sampling, a type of purposeful sampling, to describe in greater depth the experiences of a group of individuals who share similar qualities. All special education teachers who currently teach or have taught autism students in the district were eligible participants. There were 15 potential participants in the district. Six participants were selected for my study. Table 1 is a representation of the special education teachers who have experience working with students with ASD at the local site.

Table 1

Special Education Teachers Teaching Students with Autism Spectrum Disorders

Special Education Teachers	Status
Special Day ASD Classes	Severe Level Classes K-2nd Grades
	Severe Level Classes 3rd-5th Grades
	Higher Functioning Classes K-2nd Grades
	Higher Functioning Classes 3rd-5th Grades
Special Day Heterogeneous Classes	Includes ASD Students Preschool and 6th-12th Grades
Past Special Education Teachers	Have taught ASD in the past two years

Setting

The setting included multiple school sites within X School District, a Northern California School District home to a wide range of socioeconomic, parental education, and English fluency levels represented. The NCES (Common Core of Data CCD Public school data 2013-2014, 2014-2015 school year) reported the following information regarding the district selected for this study. The school district serves 945 students from kindergarten through Grade 12 students as well as provides support for students with physical, emotional, cognitive, or developmental delays. There are 68 certificated full-time teachers and 214 other full-time staff members. The district provided classroom instruction for approximately 400 special education students preschool through age 22 and instructional support for 320 students who are deaf/hard of hearing or visually impaired. The special education department operates a countywide early childhood education program and provides daily classroom instruction for the county's most severely disabled school-age students. The department delivers services to 80 school and community sites. Student

demographics include 45% Caucasian/Non-Hispanic, 41% Hispanic/Latino, 4% Asian and Filipino, 4% multiple ethnicities, 2% African America, and 1% Native American. The district includes students from traditional neighborhood schools, independent schools, and dual immersion English-Spanish programs. Eight hundred and ninety-one students are in special education and have an IEP. Additionally, the district serves 174 English Language Learners (ELL).

Researchers select a case study approach because they utilize multiple sources of data to develop a comprehensive evaluation of the studied phenomena (Yin, 2011). The current study included in-depth interviews and work journals. According to Noor, (2008) interviews are the most common form of collecting data for case studies. Interviews can be conducted to uncover a participant's feelings, interpretations, or reactions to an event or circumstance (Lodico et al., 2010). Stake (1995) further reflected, "The interview is the main road to multiple realities" (p. 64). According to Creswell (2012), broad, open-ended questions should be asked to allow themes to emerge in the study and to answer to answer the research questions. Interviews were included as part of the data collection for this study.

For this study, interview questions stemming from Ely's (1990) theory helped me identify themes related to AAC interventions for students with ASD. Semi-structured interviews were recorded and lasted approximately 45 minutes for each participant. The interview protocol (Appendix A) included questions exploring participants' experiences implementing interventions and AAC systems with their students with ASD. The

interview questions included demographic and open-ended questions. Probing questions were asked to gain more insight into their perspectives.

Multiple sources of data are required for case-study designs, so additional data was obtained through special education teachers' work journals. During the data collection phase, participants were asked to keep a daily work journal (Appendix B) for a three-week period. The participants were asked to focus their journal entries around their daily challenges and successes when teaching functional communication skills.

Data Analysis

Following data collection, the analysis process began. Bodgan and Bilken (2007) explained data analysis is a process. All interviews were audiotaped and transcribed into word processing documents. To gain familiarity with the data and insure accuracy, I listened to all interviews, read through the subsequent transcripts, and reviewed the participants' work journals, and my field notes. All participants' identities were protected and rendered confidential with the use of pseudonyms.

According to Bogdan and Bilken (2007), qualitative data should be broken into units, synthesized, and developed into broader patterns. The transcribed interview data were subjected to a process of thematic analysis through which items were identified, coded, and provisional categories emerged. According to Creswell (2012) categories are utilized be to inform the central phenomenon of qualitative research. The process of comparing and contrasting the data to establish categories allowed for generating themes, which revealed the broader relationships at play within the data. The common themes were analyzed for their relationship to Ely's conceptual framework and color-coded

accordingly. These themes connected to Ely's theory were subsequently coded and categorized. A summary of the themes was further organized and developed into a descriptive narrative of the data.

Trustworthiness

Qualitative researchers use various techniques to ensure the quality, or trustworthiness of their interpretations in their research studies (Merriam, 1998). Several were taken to add greater rigor to the study. To prevent bias from affecting the research process, I used field notes and reflective journals to document thoughts, assumptions, and concerns about the data collection and analysis phases. Observer bias (unwanted perspectives brought by the researcher) and observer effect (unwanted impact made by the observer) were countered by the solicited teacher work journals, which provided another source of data unaffected by the researcher's worldview. Additionally, member checks were included to allow participants to review their responses and the study's findings of themes to assure they were true to their experiences.

Member checks are a validation strategy that involves taking the data to participants to determine if the researcher's analysis matches the participants' intent (Merriam, 1998). Techniques such as bracketing, strategic questioning to verify information, and member checking, were used to increase the validity of the data. Bracketing is a technique suggested by Chan, Fung, & Chien, (2013) that requires researchers to set aside personal bias and feelings toward the research topic. I implemented a step of member check after data were analyzed. I provided each participant with the codes and themes that emerged as part of the findings during data

analysis of the interviews and journals. Each participant reviewed the emerged themes and codes and was instructed to provide feedback on the accuracy pertaining to their responses via e-mail. Harper and Cole (2012) supported that validity of a study is increased when a researcher provides an opportunity for participants to verify the accuracy of analyzed data. Credibility of a study is also increased when a researcher obtains input from participants on interview data before and after the analysis process (Thomas & Magilvy, 2011). Furthermore, Thomas and Magilvy (2011) explained that returning to participants who provided data ensures that interpretation of the researcher was recognized by the participants as accurate representations of their experiences. During the member check, I provided participants with the codes and themes from data analysis. Also, participants were provided an opportunity to discuss their data with me. Initially, raw data were reviewed and labeled with initial codes, according to their properties, and then their phenomena/experiences were identified as they emerged from the data. Initial codes were reviewed and refined to identify patterns and properties. Data were categorized by themes to develop concepts for this study (Bogden & Bilken, 2007).

Ethical Procedures

The research commenced upon approval from the Walden University Institutional Review Board (IRB) approval number 612-312-1210. The IRB has the responsibility of ensuring all research conducted through Walden University complies with ethical standards and U.S. federal regulations. Toward this end, all study participants were guaranteed confidentiality through pseudonyms. Furthermore, all paper data related to

this study were kept under physical lock, while electronic data was stored for five years in my home.

Summary

The research method of the proposed study included a discussion of qualitative case study design. The chapter consisted of the research design, case selection, setting, recruitment process, IRB process, and the role of the researcher, data collection, and data analysis. A qualitative design study allowed an examination of complex social phenomena to gain in-depth knowledge in a local context, of special education teachers' perspectives and experiences with functional communication skills interventions for ASD students. A purposive, homogeneous sampling included the selection of six participants who are special education teachers teaching students with ASD. My study commenced upon approval from the Walden University Institutional Review Board (IRB). My potential bias was presented, and steps were taken to add greater rigor to the study. The interview protocol included questions exploring participants' experiences implementing interventions and AAC systems for their students with ASD. During the data collection phase, participants were asked to keep a daily work journal for a three-week period around their daily challenges and successes when teaching functional communication skills. The data analyses of journal entries were coded and analyzed using thematic analysis, and emerging themes and compared with the interview data. Triangulation and member checks were used to validate the quality of this study.

Chapter 4: Results

Introduction

The purpose of this study was to better determine which of Ely's conditions of change were present in special AAC implementations efforts in one Northern California school district. The findings were used to identify challenges preventing effective AAC implementation and to develop recommendations for fostering conditions in which special education teachers' can successfully implement AAC interventions. The goal of the study was to fill a gap in the literature by providing evidence-based recommendations for strengthening AAC programs and supporting teachers in increasing the functional communication skills of students with severe communication needs. These skills will empower the students by facilitating their involvement across social environments. Individual semi-structured interviews and work journals were used for data collection. Data were analyzed thematically using NVivo software. The following research questions guided this study:

RQ1: How do special education teachers describe their experiences with the AAC implementation process?

RQ2: What barriers do special education teachers perceive with AAC usage among students with ASD in their classrooms?

RQ3: How are conditions for change being met in support of teachers' implementation of AAC interventions?

This chapter includes a description of the setting in which data were collected, a description of the data collection method that was employed, a description of the method

that was used to analyze the data, the system of tracking data, a discussion of the results of the study, a discussion of the evidence of the trustworthiness of these results, and a summary.

Setting

Participants were six special education (SPED) teachers working with ASD students in six different self-contained classrooms in a Northern California school district. All participants held a valid SPED teaching credential, were currently teaching, were 18 or older, and were currently working with or had formerly worked with ASD children requiring functional communication skills interventions for a minimum of 2 years. All participants were interviewed in their school classrooms following the end of the school day. A digital voice recorder and a printed copy of the interview questions to take notes were used as a guide and a reference for the participants. No personal or organizational changes occurred at the time of the study that may have influenced the data.

Participants

All participants held a valid SPED teaching credential, were currently teaching, were 18 or older, and were currently working with or had formerly worked with ASD children requiring functional communication skills interventions for a minimum of 2years. No personal or organizational changes in the school district occurred at the time of the study that may have influenced the data.

Data Collection

Following IRB approval from Walden University (6-12-312-1210), the data collection began. Data were collected from six participants in six different self-contained classrooms. A single, one-on-one, semi-structured interview (Appendix A) was conducted with each participant at the school sites where the special education teachers worked. I recorded each interview with a digital recorder. Each interview lasted approximately 45 minutes for each participant. In order to facilitate the collection of data from multiple sources in accordance with this study's case study design, additional data were obtained from the special education teachers' work journals. During the data collection phase, participants were asked to keep a daily work journal (Appendix B) for a 3-week period. The participants were asked to focus their journal entries around their daily challenges and successes when teaching functional communication skills. There were no variations from the data collection plan presented in Chapter 3 and no unusual circumstances occurred during the data collection phase. A request for participation letter was emailed to the local research site to initiate the data collection. Six teachers from six different schools teaching ASD students responded through email their interest to participate in my study. Each participant signed and returned the consent document.

Data Analysis

The transcribed interview data, field notes, and researcher memos were subjected to a process of analysis through which themes were identified and coded and provisional categories generated. I entered the primary forms (interviews and work journals) into NVivo (MAC 11) for data analysis. The common themes were analyzed for teachers'

descriptions of their experiences with AAC implementation, for perceived barriers to AAC usage, for the relationship of these experiences and barriers to Ely's (1998) conceptual framework, and how the conditions for change were being met to support teachers' implementation of AAC interventions. Based on the local problem of barriers during the implementation of AAC and the literature review of this topic, the following research questions were developed for this study:

RQ1: How do special education teachers describe their experiences with the AAC implementation process?

RQ2: What barriers do special education teachers perceive with AAC usage among students with ASD in their classrooms?

RQ3: How are conditions for change being met in support of teachers' implementation of AAC interventions?

The common themes were then color-coded accordingly. A summary of the themes was further organized and developed into a descriptive narrative of the data. Three major themes, corresponding to the research questions, emerged during analysis of the data. The major themes included (a) how teachers describe their experiences with AAC implementation, (b) student barriers in AAC usage, and (c) how conditions for change are being met during AAC implementation.

Interview Process

The interviews were conducted one-on-one in the special education teacher's classroom during September 2016. All participants were told their participation was on a voluntary basis and they could withdraw at any time. Additionally, the participants were

reminded that the interview was being recorded. The purpose of the study was explained and my educational background and experience were presented. The interview protocol form (Appendix A) was provided to the participants to use as a reference for the interview, and additional probing questions were explained, as needed.

The audio-taped interviews were transcribed into Word documents. I provided participants with the codes and themes from data analysis. Also, participants were provided an opportunity to discuss their data with me. Initially, raw data was reviewed and labeled with initial codes, according to their properties, and then their phenomena/experiences were identified as they emerged from the data. Initial codes were reviewed and refined to identify patterns and properties. Data were categorized by themes to develop concepts for this study (Bogden & Bilken, 2007). Participants reviewed preliminary findings to check for accuracy of my interpretation of data for their own data. No changes to the findings were necessary.

Journal Process

Forms containing prompts for participant work journals (Appendix B) were provided for each participant following each interview. Each participant was instructed to write a journal entry for each school day for the duration of 3 weeks. I collected the completed work journals from all participants. The journal entries were analyzed using the NVivo MAC version 11 software program used for the interview data analysis. Participants were provided with findings of common themes for their review of my interpretation of their own data.

Data Analysis Tracking

Each individual interview audio recording was labeled with a participant number for confidentiality purposes. The transcribed interviews were stored on my home office computer with a secure password. The recording device and hard copies of each work journal were locked into my home office filing cabinet.

Results

Three major themes, corresponding to the research questions, emerged during analysis of the data. The major themes included (a) how teachers describe their experiences with AAC implementation, (b) student barriers in AAC usage, and (c) how conditions for change are being met in AAC implementation.

RQ1: How teachers describe their experiences with AAC implementation

Teachers described their experiences with AAC implementation in terms of *successes* and *frustrations*.

Successes.

Participants were enthusiastic about their successes with AAC implementation; as Participant 3 said, “I think it's amazing. I mean...once I started doing AAC interventions by the book, I'll never go back.” Occasionally, students surprised the participants by succeeding in unanticipated ways; Participant 1 took evident pleasure in describing one such instance in a way that gave insight into how AAC implementation looks in the classroom:

> The successes are when they're telling me when they're progressing. When they know and will just go. I have one student-- I'll tell you a funny story. I was

> working with one student; I was trying to teach him to do stage two - bring me the icon. And I was going over and over and I had the thing in my hand, and he wasn't getting it. I was looking away, waiting for him. Because he would put an icon on his card, and then he'd kind of take it off his book and kind of flash it in your direction, and put it back down and expect you to know. And then I'd say to everybody, I'd say, "You know, it's like at a restaurant. If you don't give the waiter your order, he or she doesn't know what you want. So you have to get the point across to the waiter that this is what you want." And one of my lower functioning students - what we thought was a lower functioning student - looked at what I was doing with a student, came walking across the room to his book, pulled out - I think I had goldfish in my hand - pulled out the goldfish icon, walked back over to me, and handed it to me. And this was a student we thought was lower functioning. My aides were all standing around, trying to figure out what I was doing. And I said, "That's what I'm expecting is just what he did." And he was food motivated, and he's a very food motivated kid...I was like, "Hallelujah!"

Participant 2 pointed out that different students experienced different levels of success, saying, “Some of my students are communicating in full sentences and some of them are communicating with words or short sentences - two or three word sentences.” Participant 6 expressed how meaningful and rewarding any level of student success can be for teachers:

> I love it. I love that they have a way to communicate because it's huge. And I actually have a couple of students who I have been able to say, "You need to ask,"

> or, "Go get your book," or something like that, and they know what it means. And so, they like to climb on top of the counter to get the toys instead of asking for them. And I had a student today started doing that and I was sitting over here and I said, "You need to ask," and he stopped climbing on the counter, he flipped through the book, brought me the sentence strip, and I walked over and got it for him.

Successes could be cumulative; Participant 2 described the significant progress made by second-year students:

> They had some functional language. The children I had been in the program the previous year and so they had been trained how to use the PECS. This year most of my students have language. We use the picture communication icons with students when we use the first-then cards and we use the scheduling, but they're not using books.

At another point in her interview, Participant 2 described the cumulative success she had achieved with an ASD student:

> The student with autism is the one that was in the class that was designed for autism, and he was in that class last year. So, he learned a lot of skills last year, and they've carried over into my class this year.

Participant 3 was skeptical of AAC interventions, but was pleasantly surprised when she began to implement them:

> I always used to think, "They're crazy. How can I do that?" But once I embraced it and said, "Okay," it's like, "Well, because it works. They're not crazy. It's just

> that's the way it works, and that's the way you have to do it." So you have to make it happen. So I think it's been tremendously effective.

A feature of the intervention that had helped Participant 2 to succeed was its student-centered design; she described the resulting progress she saw in her ASD students:

> I used it last year and I found it to be very successful, and it's very child-centered, I found, in that the children would mostly use their books at snack and lunch again, and my children that had autism stopped using the books, stopped bringing them to lunch and started using their language.

Participant 4 appreciated the visual tools associated with the intervention, and described one instance of progress and success that she had experienced in using them:

> We do 20 minutes so it's broken up for them and in small chunks, and that seems to really help keep their attention and kind of keep them going in a pace. Coming into the classroom, I use little visuals for behavior. My little girl here, she's autistic, and she can talk. You can reason with her, and she doesn't really need a visual per se, but they are helpful. It's like, "Oh, you're making a happy choice or a sad choice?"

At another point during her interview, Participant 4 referred to her projector, another visual tool with which she had had success:

> Using the visuals and definitely using my projector, has really engaged my students. They're very focused at the board. They look up there...It's very

> consistent and then the focus is up there. They're all sitting at their desks. It looks very middle school appropriate in here.

Classroom routines were a contextual feature of the interventions that could help students and teachers to achieve success. Participant 4 stated:

> And then a routine, just routine - like every morning, they know they have the dots lined up outside. And they know that's where they stand on their dot. Pick any dot they want, but that's-- when they stand on it, that's the dot they're going to be picking up to put on the counter. Then they go-- it's like a little rotation we have. They go over, and they put their backpack away, and get their parent folders out. Then they need to go put their parent folder in the basket. They need to come over and get their chair, and get their chair back to their desk, and sit down and look up there...It helps with our transitions. It helps with their anxiety of like, "Oh, things are going to be changing." Or, "Free time is over."

Achieving success sometimes meant making adjustments to preexisting classroom routines. Participant 3 described an adaptation of classroom procedure that she introduced in order to facilitate the staff-to-student ratio which the proper implementation of the intervention required:

> After...training, I said to myself, I said, "We're doing it like this. We're doing it by the book, like step one, step two, step three. This is the way we're doing it, and we're going to really do it correctly. This is an evidence-based program. We're doing it by the book."...So I just rearranged my schedule and I kind of, "Every kid sacrifices for everybody, so you may not get as much today, but you'll get it

> tomorrow." So we started doing that, and it was like night and day difference. Night and day difference.

Modifications also sometimes needed to be made to the usual classroom schedule in order to accommodate student needs and ensure that the intervention was effective. Participant 3 creates situations to help students make sentences:

> I have one little boy too that will build this beautiful sentence and sit there. So I actually today went back to two to one. I rearranged my schedule and went all the way back and said, "No, he needs initiation." So you be the silent prompter, and then you go back and do that. And then, the-- I have one in the play area. So that's open to anybody. So I try to create situations. Like today, I put out the really cool car ramp and held all the cars.

On at least one occasion when Participant 2 was uncertain of how to proceed with an intervention, she relied on advice from more experienced colleagues to achieve success:

> I asked my colleagues who have more experience, and they said well if they chose not bring their book to snack and lunch that's because they're willing to use their language. I asked them questions, "What do you want?" If they hand you something to open, "I don't understand. What do you want? Use your words. Tell me what you need," and they would say - maybe not a complete sentence - but,bn "Open please" and I felt like that was functional communication.

Participants frequently referred to their successes with PECS. Again, successes were achieved incrementally and at different levels. Participant 3 described success with PECS:

> The labeling is a PECS because they do build the sentence of I see, and then they write down the-- if I hold up an apple, they'll take the I see card, and then they'll pull the apple card down, and then they hand it to you, and they do the point, and I read it for them.

Varying instructor roles could help to keep students active and learning. Participant 4 switches up the instructor roles so they learn PECS:

> So part of what we do with the adults is we make sure that, especially when the initial stages of PECS, is that they're always going to somebody. So we are very conscious of when we're doing especially that two people where we have the prompter and we have the communicator, we're always switching. So when we switch-- like say we do like a 15-minute session, whatever, and if I say, "Were you the communicator or the prompter? Okay. If you were the communicator, you be the prompter." So I'm always having everybody switch it up so that they learn.

Participant 5 had experienced different levels of success with different PECS methods:

> It depends on how it's set up. If they've got a PECS board which just has pictures with little words under it, I find it very constraining. A PECS book, you can put as many pictures in it as you want, and they're free to go in that book and express themselves using any of the PECS. And what I see at the-- especially the K2 level, is the PECS board, but if I was a child at that age, whether I had autism or not and I was using a PECS board, I would get so frustrated I would just want to scream because it only lets me communicate a certain number of ideas.

Participant 6 had promoted success with a combination of methods:

> We use the visual schedules throughout the whole day. Each student has their own PECS book. And then I also have a classroom choice book that has all of the toys that we have throughout the room, and then they use them at snack and at lunch. And they bring them to groups with them. I have working four boxes for each of the students that has a card in it that says, "I am working for." And then there's icons in their boxes for everything.

Participant 4 described an example of progress with PECS:

> One of my students now uses PECs to communicate all the time and tell us what his choices are for food and snack for lunch. So he'll give us a PECs card saying that he wants his apples, or he wants pretzels or whatever it is. So he's got like out of a field of 16 little pictures, and he'll just grab them and give it to you...We're starting to put it together in a sentence for him, the I icon and then Want and then Apples Please. So he'll at least put it in a sentence strip. My other student, he can use language, so he's come really far. He doesn't really need the PECs. He does appreciate the visuals and the visual schedule we have. But as far as picture exchange, he doesn't need that because he's verbal. He can communicate his wants and needs.

Success could be promoted with effective motivators; Participant 2 described the incentive she'd found most helpful, saying that her interventions were most successful, "When there's the motivator for the children. So at snack and lunch...Because food is a real motivator." Participant 6 had also had success using food as an incentive for student growth:

> There was actually a day at lunch when one of my students wanted crackers that another student had, and I was like, "You know what? Why don't you ask him?" And so he handed the other student his certain strap...and it happened to be a verbal student that he was handing it to. And I said, "Read it to him." And so he said, "I want crackers." And then took a cracker and said, "Here you go."

In addition to food, iPads could be effective motivators. Participant 3 used the iPad to motivate the students:

> So like, for example, today, one of my students sat down at lunch, and my staff went to go say, "Get your book. Uh-uh, uh-uh, sit down." Let them sit down at the table. And if they hand you the fish crackers, go, "Oh, fish crackers." And then, once they initiated, then go show them to go get their book. So I'm doing a lot of that now on level two if they sit at my table, and I will purposely entice them. Because some of mine are so-- they know the deal, like, "I go sit at the table or workstations. I'm going to grab my book." And they come and they sit down and they build their sentence and they say, "I want iPad," and you're like, "Sweet, let's do this, and then you'll get your iPad." But some of them need to revisit initiation.

Participant 4 promoted success by giving students a choice of incentives:

> [A]ll my students use [the] reward board—"What are you working for today?" They can pull the icon off if they can't talk or communicate their need or want...they'll just reach out and grab one and put it on their own board...and then during work center they'll go around and-- work center they get two checks and

> then at the end, "Oh, good, you got your five or six checks." And then, "Okay, you can have your free time."

Rewards that were earned incrementally could also be effective incentives. Participant 3 described rewards for her students:

> So they get tickets. We have incentives. We've got prize corner on Friday. They earn tickets all week. We count them. They earn prizes. So we have lots of little systems for reward. Every day they get to earn their free time. They get to earn computer/iPad time, lay on the beanbag time. Whatever it is that they want. And I've got two little kids who really like to just get in the bins and play with stuff, so. As long as they pick it up.

Frustrations. Teachers could become frustrated when students did not make expected progress. Participant 1 expressed frustration:

> I've got some that don't even have preferred/non-preferred. So, handing the crayon yeah, it says they get it a week. I think this kid has been working on it for years. It's not there yet. So, yeah, that's frustrating.

Participant 6 gave more details about the frustrations of inadequate progress:

> Well, it's all a challenge [chuckles]. Just trying to teach them how to communicate using their books, or using Proloquo on the iPad, or something like that. Learning it for them because it's new and it's hard. And until you really get it, it's just frustrating. So I think that's the hardest part.

Participant 1 described another frustrating pattern of student behavior associated with disappointing progress:

> I'm going through the book trying to figure out what we can use as, and sometimes I can grab something and say, "Okay, just call it this today," and we'll have the student who will go with that...Some of them. And sometimes they don't get that, so that's frustrating for me.

Inconveniences associated with classroom materials could also cause frustration: “Sometimes they don't have the icon in their book because they don't put it back on their Velcro and then it falls out somewhere along the line...That's so frustrating” (Participant 6). Participant 5 said of the PECS books: “The teacher made them themselves, they kill themselves making them.” Students’ negligent treatment of these materials could frustrate the teachers who had invested so much effort in creating them. Participant 1 stated:

> The classroom was here and the kitchen was over there, and there was always a trail of icons going from the classroom to the kitchen. Somebody just picked up the book, the whole thing, the icons just kind of fell out as they walked, it was pretty funny. And it was also really frustrating, it takes a lot of time.

Student behaviors unrelated to schoolwork could also be frustrating, as in Participant 4’s experiences with an ASD student:

> It's so common that they just, they kind of repeat everything they hear in their environment and then...Or if it's something kind of negative, with him he kind of takes on. And that's the thing he-- he'll ask you, "Where's your grandfather?" "Well, my grandfather's passed away." So then he'll ask me the next day, "Your grandpa's dead." And it's like, "Well, yes, he is, but I don't like talking about it."

> "Yeah, we don't talk about that," "You're right, we don't." And then getting him to move on from that is sometimes...I have to shut him down with a minus, which he doesn't like. Or I have to be like, "We're not discussing that. You can talk about that at home," or-- but once people answer you, we're done. Because he will ask you the same question.

Two participants described their frustration with Proloquo. Participant 1 expressed:

> PECS, I'm okay with. Proloquo, I get all confused about how to get in and set up the categories...Proloquo, I'm not as confident with, which is probably why I don't use it as much as I should have. I know one of my speech teachers two years ago, set up a whole circle thing on the computer for me to use during circle time. And I don't ever do it, because I couldn't get into the right place or I couldn't find it. So I just don't.

Participant 3 said of PECS in relation to Proloquo that it was: “much easier than Proloquo. Proloquo, I find challenging.”

RQ1, summary of teacher descriptions of AAC implementation. Participants’ descriptions of AAC implementation were discussed in terms of successes and frustrations, with successes and the associated feelings of excitement and achievement being mentioned with the highest frequency. When teachers described their successes in general terms, they referred to the incremental nature of the progress they had achieved, and they noted that different students achieved different levels of success. Success in facilitating student progress was meaningful to teachers, but it may have been most

rewarding when students achieved at a higher-than-expected level. Strategies that teachers had used to achieve success included offering incentives such as food or a choice of rewards, using PECS, adhering to prescribed intervention strategies, organizing classroom schedules into consistent routines, and modifying pre-existing classroom routines in order to meet student needs and facilitate the proper implementation of interventions. When participants reported feelings of frustration, these feelings were associated with students' failing to make expected progress, students' negligent treatment of classroom materials, student behaviors unrelated to schoolwork (such as the repetitious personal questions of an ASD student), and (in the cases of two participants) Proloquo, which was considered difficult to use.

RQ2, Student barriers to AAC implementation.

Teachers described the barriers they had encountered in implementing AAC interventions with ASD students in terms of *difficulties with comprehension*, *difficulties with expression*, *violent behaviors*, and *resistant behaviors*.

Difficulties with comprehension. Student difficulties with comprehension were sometimes associated with teacher frustration. Participant 1 experienced difficulties with comprehension skills with students with ASD**:**

> The kids are lower function kids who don't seem to understand a free choice either. If I hand them a board with things and said, What are we working for? And they just draw anything. So they're not-- like I said, I've got some that don't even have preferred/non-preferred. So, handing the crayon yeah, it says they get it a week. I think this kid has been working on it for years. It's not there yet.

Frustrations associated with classroom materials could result from students' in comprehension. Participant 1 explained her frustration with loss of materials:

> A lot of our icons are missing. That's what I did yesterday, was go through piles of icons that have been lost and that's the other thing that's a problem. Is that kids don't understand Velcro. So they throw the icon in the book, they pick up the book, and there's this - I call it Hansel and Gretel - we got a little path of icons that have fallen from books. We started down a walk today and there was a walk icon halfway down the path, and it's like, "How did it get here?" And we're losing it because they're-- you go out in the playground, you look over the fence and there's a bunch of icons laughter. Just trying to-- falling out of books. So that's frustrating, is knowing that I made 15 of these icons last week, and they're all gone and we don't have what we need…students don't understand that you can't just throw [the icon] in the book. It has to stick.

In other cases, student difficulties with comprehension could be frustrating to the students themselves. Participant 6 stated concern of the discrimination skills for students with ASD:

> Discrimination, I think, is the hardest. I have a student who discriminates just fine between his food icon, but his schedule, he doesn't discriminate at all. And I don't know if it's I can't, or won't, or doesn't want to [chuckles]. And then, since I have so many kinders, I also have the ones who are kind of still at that phase where they're learning to discriminate between their icon. And so not being able to find the icon that they want for the item that they want, then it gets really frustrating.

On the other hand, student difficulties with comprehension could be mixed with significant successes, and could stimulate teachers to greater dedication: Participant 3 experienced success with a student with ASD:

> In the three years that I've been doing this, there's only one kid that I didn't get him through the phases...I consider that a huge success. I mean we went to objects, and we went through all kinds of different things. And I'm not willing to give up on him. He did get the exchange part. He can or he could give you the card or the object. Like he knew the contingency management of I give them this thing and then I get what I want. So that part, he got, but just the whole cognitive part of discrimination can sometimes-- I think that's [laughter]-- but I still feel like that's out of three years and only having one, I think that's really good.

In some cases, student difficulties with comprehension were expected, and were remediable with simple instruction strategies like offering reminders. Participant 2 stated that some students required reminders about their AAC use:

> It's the beginning of the school year, so the children that really need to access [their AAC] are still learning where it's located and they're still learning how to use it…[Students struggle with] just remembering to use it, they need reminders.

In other cases, students' difficulties with comprehension appeared irremediable. Participant 4 described her experience with one such student: "[the student] couldn't sit here and add three plus one for me to save his life." Participant 1 described other instances of apparently irremediable incomprehension, making mention of some of the strategies she had tried:

> I did have a couple of kids who were still doing preferred/not preferred. And obviously if they're 20 years old and doing preferred/not preferred, they're not going to get it, no. And we did everything, where we did a plexiglass thing with the food and then a card right above it, so they could see the food as well as the card. I did erasers, which were eaten - the food - everything to try to get pass that.

Participant 1 also reported difficulties with comprehension that affected an entire class, rather than just a few students: “We're using visuals, yes. In this class, I don't really have anybody who could understand that. In classes in the past, sometimes a little bit.” Finally, teachers’ reports that Proloquo was challenging to use were occasionally reflected in the difficulties students had in trying to learn it. Participant 1 expressed:

> Like Proloquo, it takes a pretty high functioning student to know how to get into the Proloquo, get to the right category, get in, and that's a lot of steps for these guys. For that one, I find to be challenging. I've had very few kids who could do Proloquo.

Difficulties with expression. Teachers often encountered difficulties in getting students to express their feelings; Participant 3 described the challenge of teaching emotional expression to ASD students:

> I think it's a really hard thing. I mean it's so abstract. If a child can't even label that, "I see apple," or, "I see ball," which is totally concrete and right in front of them, then being able to say, "I feel sad," is like, "Whoa [chuckles]." That's a total different ball of wax. So I think that's why I originally started with the happy and sad is because I had a kid who was working on emotions. And it was like, "Well,

> sure, you can show a picture of a baby crying, and they're sad, but are they connecting it at all--" I think typical three, four, and five-year-olds have a very hard time of labeling their emotions anyway. So now, you put in cognitive and ASD diagnosis and all that kind of stuff, so I think it's something that we're always struggling with and working on to figure out a way to help them. So yeah, I don't know, haven't figured that one out yet.

Students' difficulties with labeling their emotions could be exacerbated by distress, and, at other times, emotional labels could be used meaninglessly. Participant 6 explained that ASD students' difficulties with their expression of emotions:

> I only have probably, maybe three of my nine that could express how they feel and that's only when they're not upset. I have one who actually has been walking around all day going, "I feel happy." And I'm like, "Do you actually feel happy or you're just saying that [chuckles]?"...And then, we have the behavior on top of it. They're already mad at us for not giving them what they want, but they didn't tell us what they want. So it escalates really quickly...I have a couple of them who are learning to ask for a break when they start getting upset. So trying to help them identify it before it escalates, so they can ask for a break and calm down, and not get to that escalated point. But I also think that that's also very abstract and not--it's hard to, I think, realize when you're getting worked up when you already have such a hard time identifying your feelings. So, they can't really use their PECS books - as it would be in this class - to tell us how they're feeling.

Difficulties with expressing feelings could also interfere with students' ability to describe important physical sensations: Participant 6 was concerned with the student's ability to describe their feelings:

> They can't use PECS to tell us what they need in order to feel better, which is also really hard when they're sick and they can't tell us, my head hurts, or my stomach hurts, or-- because they haven't really identified that yet.

Participant 5 reported that her students also found it challenging to label their physical sensations: "Sometimes they might [have trouble expressing their feelings] if their illness is difficult for them to define. The fact that they're not feeling well physically."

Difficulties with expression were not necessarily related to any disability; teachers had also encountered challenges in helping students to express their feelings when those students had a first language other than English. Participant 5 discussed this challenge:

> I have two whose families are basically Spanish speaking. So, their struggle would be proper context of a sentence, proper pronunciation sometimes, punctuation, putting the adjective after the noun instead of before the noun or whatever.

Participant 1 reported another experience with an English-second-language student:

> I have a little girl here who's Spanish speaking, so we have like a language barrier with her too. So we're using more visuals with her to help her like get more language...I'll show her-- we're doing signs and grocery words in here, because that's most functional right now. So she'll say it. When she sees it, she'll say, "Apple" And I'll be like, "No, it's stop sign."

Violent behaviors. Some of students' physically aggressive behaviors were comparatively harmless. Participant 1 described one of her student's violent behaviors:

> One boy who grabs my arm and pulls, and he can tell me both with, he's got a free choice card on the wall over there with things that are in that cupboard, and he needs to go. I'll say, Talk to me, and he knows to get the card, but he'd rather pull.

At times, students' physically aggressive attempts to communicate were reinforced by other students, such that the behaviors were more difficult for teachers to modify: Participant 6 stated:

> I think the hardest part is when a student says, "Come play with me," and the other student doesn't respond. Because then in their head, I imagine they're thinking, "Well, he responds when I push him, so that's what I'm going to do."

Participant 1 also had experience with a student who used apparently aggressive behaviors as means of communicating friendly intentions: "I have one girl who shoves kids because she wants to play with other students." In Participant 6's experience, violent behavior could be restrained by teacher monitoring, unless there was an especially provoking incentive involved, such as a toy:

> There are times where one of my students has gone to hit another student, and then realized that we're watching, and stopped because he knows he's going to get into trouble...With their peers, they almost don't care whether or not it's going to make them happy or sad, or who is watching, or if they're happy playing with that toy. They say "But I want it. I'm just going to take it."

Violent behaviors could be particularly challenging when teachers were unable to find an effective way to modify them: Participant 2 expressed:

> The student is a bitter and a scratcher and a kicker, and he's choosing to yell, and say, "Go away." He's choosing to scratch and to kick rather than bite, so progress…[but I feel the intervention is not working] when I'm not able to figure what is going to help a student become regulated when they're dysregulated.

Violent behaviors could appear to be disproportionate reactions to small frustrations: Participant 4 described one student's behavior as:

> I had one little girl get eight [minuses] today. She was autistic and not wanting to do her work. So we were having a lot of compliance issues lately with her. I am going to be using more visuals. She walked around my class during work centers and hit four of my students, came up and hit me. Not hard, but just hard enough just to be annoying. And, yeah, so we're working on that.

Violent behaviors could also be the result of students' impatience with the interventions themselves. Participant 1 described, "My student who blows up when we use PECS, because he doesn't want to do it. He just wants us to give it to him, 'Just give me the food.'"

Resistant behaviors. Participant 4 described her experience with two students who resisted instruction simply by leaving the room, such that she had to interrupt the class to retrieve them:

> Last year I had two that would get up and move out and just leave the room. I did data one day, and he was autistic, but he-- did data, it was 64 times he had left my

> classroom, so I could hardly teach. I was up, down, up, down, "Hold on, I'll come back," and that makes it hard.

Other students engaged in a variety of uncooperative behaviors. Participant 4 described one student's uncooperative behavior:

> I've got one kid, if I give him a minus, it will shut him down for the next two days. He will hide his star charts in the bushes. He hid them in a broom handle. He unscrewed it on the bus and put his star chart in there and tied it back up because he just did not want to take home a minus to his family. He just wants to be a good boy. Every now and then, you earned it because I've asked you 20 times and you still haven't done it. I give him a lot of chances because his Dandy-Walker causes him to be slow and process everything I say super slow and to get up and move. So last year in the beginning, I tried to push him more, like, "Okay, I need you to come and guide him." And he'd get stuck and then it was a battle. And I was like, "Okay, I didn't want to battle you."

Sometimes students simply lacked the motivation to address the challenges involved in the intervention. Participant 1 stated:

> The students' motivation is not - depending on the level of the student - they're not there. Like I said, I've seen it used for a swing and you have them ask for another swing. Well, I'm not sure my kids are motivated enough to really come and get a card and say, "More swing." They'll just walk away.

RQ2: Summary of student barriers to AAC implementation. Student barriers to AAC implementation fell into four categories: difficulties with comprehension, difficulties with expression, violent behaviors, and resistant behaviors. Some students had disabilities that prevented them from understanding aspects of the intervention. The challenges their incomprehension presented to their teachers were sometimes frustrating for teachers, but at other times (when the challenges became successes) could stimulate teachers to greater dedication. Student incomprehension could range from irremediable to minor lapses of memory that could be addressed with a simple reminder. Teachers reported encountering significant barriers in trying to teach their ASD students to label and express their own emotions and even physical sensations. Self-expression in an English-medium school was also difficult for students whose first language was not English.

Violent behaviors were a significant barrier to the smooth implementation of AAC implementations. Physically aggressive behaviors were sometimes attempts to communicate requests or even friendly intentions, as in the cases of shoving or arm-pulling to get a peer's or an instructor's attention. Violent behaviors could also indicate deliberate or impulsive aggression, however, as with students who bit and kicked during tantrums, and students who snatched toys away from peers. Participant 4 stated "other resistant behaviors were milder, as with students who repeatedly left the classroom or "shut down".

RQ3, How conditions for change are being met in support of teachers' AAC implementation.

Conditions for change discussed by participants were time, knowledge and skills, resources, participation, and leadership (Ely, 1990). According to Ely (1978), all eight conditions do not have to be met for an innovation to be implemented.

Time. Participant 4 was given extra time by an early release day**:**

> I know this year, which was new for us, we now have prep time. So on Wednesday, we now have a short day...The kids go home at 12:45, and then my hours stay until 3:15. So I have a good almost three hours to get stuff done. On Wednesday, I can access technology, or I can set up Proloquo devices or stuff like that. So there is more time embedded this year...It's helped me prep projects, and prep art projects, and prep the things that the students need, and that we want to do next week. Yeah, to have my prep time is huge. Because, if you don't have it, you're working on your own time, which I've done for years. So it's nice to have it embedded.

Participant 2, on the other hand, was clear in stating that she did not have enough time and appeared very frustrated when discussing this:

> There's never enough time. Never enough time...There's just not enough time. Some things just get let go, because of the priority and importance of other things. I don't have an hour a day for PECS. I have three and a half hours a day for PECS, IEPs, everything else, communicating with the parents, making phone calls, working with other agencies, about the students...I don't mean being given time,

> release time to do anything. I mean just more time in the classroom, more exposure to working with the kids, that kind of time.

Knowledge and skills. Participants reported an impressive range of training and experience, but they indicated that additional training would have made them more effective. Participant 1 had received training in PECS ("I went to PECS training. I've been to three or four PECS trainings"), but she felt she needed training in Proloquo:

> I think more trainings that I'd just to use right away, like Proloquo, how do you get in there. And I think for me, I'd go to the training and I'd come back. And if I don't use it right away, I forget. I guess it's trainings, probably. Or somebody here who can answer questions immediately, or give me help immediately...Like immediate hands-on...I think for me, when I was using it in the transition classes, I felt that I was using it more. And I feel kind of-- I think because of the level of so many of my students, that I kind of give up.

This need for this need for training connects to commitment, leadership, and support. Participant 2 also expressed a preference for hands-on training, and she proposed a training method that would have met her specific needs most effectively:

> I think there's always a need for additional training. I really feel that on the job is the best way to learn it, doing it, and using it. So, yes, more training would be great. It's packed full with so, so much information, and I hear different things from different people. Yes, more training would be helpful. Using it is the best way to learn it...The training is packed with so much information, and I don't really use everything that the training taught me because my students don't really

> need all that stuff. So, really, the best training would be to have somebody who's really trained in it and experienced in it to be in my room and model how they use it...like a coach. So, modeling it.

The perceived need for training connects with a need for more time to complete training and time for the coach to provide by the coaching.

Participant 3 was confident of her own expertise, but she expressed a need for continuing education in order to keep her up-to-date on developments in intervention strategies:

> I feel like I have got it down pretty good...I have had the level one-- or the one and the two, and that's all been within like three years. I still feel like I'm good, but I could actually see there being a benefit in even though you feel like we're doing a good job, to go back and like refresher because I feel like you learn more every time. I know that PECS now has a technology one now training that you can go to because they've now come up with a PECS app and all that kind of stuff.

Participant 4 expressed a similar combination of confidence in her own skills and a desire for more training: “I think I could definitely get more training in it and learn more...But I know how to use it pretty well.” Participant 5 also wanted training to keep up with new developments: “if I needed to...make a refresher, I guess because that program has changed radically in the last four or five years.” Participant 6 expressed a desire for a refresher course in the fundamentals of PECS:

> I've already done both the PECS trainings but I feel like that's something that I could use a refresher on every however many years, just to go back, and

> especially now that I've been doing it for a while, to go back and say, "Oh, yeah. That's how that's supposed to look."

Resources. Participants frequently discussed the challenges associated with creating icons. Participant 3 explained the importance of icons: “the downfall of PECS is that if you lose a picture out of your book, then theoretically you've lost your voice.” Participant 2 said that she always had the necessary supplies, but that her mention of having insufficient time (quoted above) was related in part to her being responsible for assembling these materials:

> Materials that we need to create the pictures is available to us. It's never a
> I get the impression it was very administrative-driven, that this is what they wanted to do. This is the program that they wanted to create for our students on the spectrum...and then problem...That's where the time come in. We've got to cut the pictures out. We've got to figure out the pictures we want, cut them out, laminate them, put Velcro on them. That's where the time comes in.

Participant 1 described similar experiences with having to invest time in assembling materials that might be lost the next day due to students’ carelessness in handling and carrying them (the PECS icons), and she indicated that the necessary supplies were difficult for her to obtain:

> If you're losing icons, if these kids are losing icons constantly you need to be making new icons constantly - they take a lot of time to find it, put it together, cut it out, laminate it, cut the laminating, Velcro it. It just feels like that's all you do...And you lose it the next day, and then you see this teacher is ripping her hair

> out [laughter], "They made ten of them last night." So that, yeah, that's a big one…[Related to unavailability of resources, she had trouble obtaining] Time, but then there's also the Velcro, the card stock, the laminating material...Oh well, it happens after school or at night, put on a movie and make icons.

Participant 3 did her best to prepare her icons in advance, but she was unable to predict every contingency for which a new one might be needed:

> I think the downfall is whether we are organized enough to have the pictures that they need. I mean that would probably be the only time-- and then, I have a running list in my classroom of PECS I need to make. And then, I have a huge binder full of pictures. So I try to make it that I have everything that I think they're going to need...But sometimes, you don't. Sometimes, they have a random thing in their lunch or-- like I bought a new toy, and I bought it for something. I bought it as a visual for a story, for one of my books, and now, they all love it. So it's an accordion. So I had to go let go, make accordion cards, but I didn't have it right then because I really wasn't anticipating [chuckles] everybody loving the accordion, so then I had to go make a bunch of accordion cards and put it on my play and anybody else so that then they could access. So I mean that's probably the hardest part about PECS is keeping up with it.

Participant 3 also described the difficulties she had encountered in obtaining supplies for more pictures: “Velcro's not cheap, so you're like begging, pleading, and spending your budget.” Participant 3’s pleas for resources were successful, however: “Materials are provided. We always have the card stock. And if we don't, they're happy-- they make it a

priority here which is I find really helpful because that's a huge thing, and it is time consuming."

Participant 4 spoke appreciatively of the resources that were available to her, mentioning a number of valuable tools:

> There's tons of resources available. We have the adaptive tech...And then, we have the library has tons of resources, and books, and CDs, and books on tape - just whatever you wanted to enrich the students. We did a transportation unit this summer...I grabbed the huge box, the transportation box at SCOE it had all the stuff in it that I could show the kids, do with them, what books...It's there. You just have to access it. Yeah, to go up there and get it...SCOE has given me four iPads to use in my classroom…

Participant 4 was given resources by her school, and was also applying for a grant:

> So that's been really great. I'm also writing a Medi-Cal grant, Tracy's going to be writing one to get us more technology, so I'll be getting an extra computer in here, a new iPad is supposed to be coming soon. I'm writing a Medi-Cal grant for myself for a CBI - or Community-Based Instruction money - so that will be able to take us out. We can go shopping with that money, do our cooking, do our whatever it is that we need for that. But all the teachers are writing Medi-Cal grants. So the funding, it's like we have it available. They also gave us $200 in the beginning of the year, which we couldn't really spend that on anything we wanted. I tend to buy more food and stuff for my kids because I've got kids who don't eat and they won't eat the school lunches.

Participant 3 was amply supplied with PECS books: “So in my classroom, they have their own personal PECS books. They have one in the play area. There's one for outside, and then I have one at circle. So they're everywhere.”

Leadership. Participant 1had mixed experiences with leaders and reported that one administrator had helped her to obtain training, but that similar support was lacking for some of her colleagues:

> The administrator did pay for the training and suggest I go to the trainings. Because I moved over from ED, I was working with ED kids...It would be really nice to have somebody, who was kind of in charge of making sure that all the areas were covered. That everybody was trained. That they were following through. That if they had any questions, they could go to somebody and get the questions answered. Somebody could come into the classroom with specific students. My preferred/non-preferred over many years, if somebody could be in the classroom who could give me more ideas on what else we can do.

Participant 3 said of her program: “[Administrators] came to class, and looked at the programs, and gave feedback, and whatnot. So it started much higher up, that the administrators wanted this program.” Participant 6 spoke of her supportive leaders and administrators:

My district sent me into the PECS trainings. So it was work days that I took off. They got me a sub, and sent me to Sacramento...Two days, yup, and they paid for all of it... makes it really easy for you to be trained, which is awesome, especially as a newer teacher. Because I know a lot of the people that I went with the credential program with don't

have that kind of experience with their placements. So I feel like I got really lucky because I feel like I can go to...my principal. I feel like I can go to her with anything and say, "I need help," and she'll say, "Well, here's this training," or the other day I told her I have some behaviors that I'm having a really hard time with, and within a week, the behaviorist was in here observing and giving feedback.

Participation. Teachers appreciated the participation of their aides and speech teachers in the AAC interventions. Participant 1 stated:

> I've had speech teachers who have made things for me, which has helped, or set up the Proloquo board for me - like for circle time - that's helped. So that's helped to just have people help me get the materials together. It helps to have trainers. I've sent my speech teachers out at snack time to work with the aides. So it's one other person telling them what to do, so I'm not being the nag all the time. So that's like the teacher we've had, I don't think she's done it yet, but I said, "Would you just-- " oh yes, she did go out last week. I said because I don't think they're listening to me. So go out, here is another voice saying this is the way you do the four-step correction process, or this is how we introduce whatever. So that's helped a lot.

Participant 3 was also very happy with her aides:

> One of my assistants this year did to go the PECS training. So she is formally PECS trained. My other assistant was not here at the time, so she is not, but I feel completely comfortable with her doing PECS because we have done extensive amount of training together, and she's smart as a whip. And the way I do it in my

> classroom is kind of interesting because I have-- my assistants are super trained in phase one and two. I always have everybody do phase one and two. But then, when we get to discrimination and distractors and correspondents checks, I do that. Because they feel like you have to be super consistent with that part of it, and I'm afraid if everybody's doing it, there's going to be inconsistency. So while I'm working on that, they just continue with distance and persistence, kind of just to keep it fresh.

Participant 6 had trained her aides herself to make them more effective:

> Since I've been PECS trained, I have then trained my staff. I have three aides that work in my class...and the speech therapist is really great about it too because on the days that they're here, they're here for at least one of our two eating times, which is when everyone's in the same place. And so they can also show the assistants what to do. So if they are doing something wrong or don't know exactly what to do, they can ask the speech therapist. So then there's three people in the room that have been PECS trained. But the ones that my assistants are working with already know how to use PECS, so they already know how to go into their books by themselves, look for what they want, put it on the strip and then hand it. And then my assistants know to hold it, wait for them to tap and read it off. And then they give it back. The kids get their icons back and then they get what they want...They're awesome.

RQ3: Summary of how conditions for change are being met in support of teachers' AAC implementation. Conditions for change discussed by participants were knowledge and skills, time, resources, participation, and leadership (Ely, 1990). All eight conditions do not have to be met for an innovation to be implemented (Ely, 1978). Participants brought considerable knowledge- and skill-base to the classroom, but all believed that they would be more effective if they received additional training, either in the form of continuing education to keep them up-to-date on innovations, in the form of hands-on training and coaching, or in the form of refresher courses on the fundamentals of interventions. Participants expressed satisfaction with the material resources that were made available to them, but the responsibility of creating pictures for PECS was often burdensome because it was so time-consuming. One participant mentioned that the time available to her was inadequate, but another participant was appreciative of the extra time she gained from an administratively imposed early release day. Overall, data indicated that participants needed more time for planning and preparation. Participants also spoke appreciatively of their leaders and for the participation of their aides, although one indicated that the training that had been arranged for her colleagues was often inadequate, and another indicated that she had needed to train her aides. Overall, participants discussed most of the same themes with a variety of different thoughts and importance on the particular themes. There were not any discrepant cases based on the findings.

Evidence of Trustworthiness

In order to prevent bias from affecting the research process, I used field notes and reflective journals to document thoughts, assumptions, and concerns about the data

collection and analysis phases. Observer bias (unwanted perspectives brought by me) and observer effect (unwanted impact made by the observer) were countered with the use of the solicited teacher work journals, which provided another source of data unaffected by my worldview. Additionally, participants reviewed their responses and the study's findings and themes to ensure they were true to participants' experiences. Also, participants were provided with an opportunity to discuss their data with me. Initially, raw data was reviewed and labeled with initial codes, according to their properties, and then their phenomena/experiences were identified as they emerged from the data. Initial codes were reviewed and refined to identify patterns and properties. Data was categorized by themes to develop concepts for this study (Bogden & Bilken, 2007).

Qualitative researchers use various techniques to ensure the quality, or trustworthiness of their interpretations in their research studies (Merriam, 1998). Several were taken to add greater rigor to the study. To prevent bias from affecting the research process, I used field notes and reflective journals to document thoughts, assumptions, and concerns about the data collection and analysis phases. Observer bias (unwanted perspectives brought by me) and observer effect (unwanted impact made by the observer) were countered by the solicited teacher work journals, which provided another source of data unaffected by my worldview.

Member checks are a validation strategy that involves taking the data to participants to determine if the researcher's analysis matches the participants' intent (Merriam, 1998). Techniques such as bracketing, strategic questioning to verify information, and member checking, were used to increase the validity of the data.

Bracketing is a technique suggested by Chan, Fung, & Chien, (2013) that requires researchers to set aside personal bias and feelings toward the research topic. Transferability was enhanced by a clear, detailed description of the research context.

I provided each participant with the codes and themes that emerged as part of the findings during data analysis of the interviews and journals. Each participant reviewed the emerged themes and codes and was instructed to provide feedback on the accuracy pertaining to their responses via e-mail. Harper and Cole (2012) supported that the validity of a study is increased when a researcher provides the opportunity for participants to verify the accuracy of analyzed data. The credibility of a study is also increased when a researcher obtains input from participants on interview data before and after the analysis process (Thomas & Magilvy, 2011). Furthermore, Thomas and Magilvy (2011) explained that returning to participants who provided data ensures that interpretation of the researcher was recognized by the participants as accurate representations of their experiences.

Summary

The purpose of this qualitative study was to determine the relative importance of Ely's conditions of change in special educators' augmentative and alternative communication (AAC) implementation efforts in one Northern California school district. Participants were six special education (SPED) teachers working with autism spectrum disorder (ASD) students in six different schools in one Northern California school district. A single, one-on-one, semi-structured interview was conducted with each participant at the school sites where the teachers worked. Three research questions guided

this study. The first research question was: How do special education teachers describe their experiences with the AAC implementation process? Participants' descriptions of AAC implementation were discussed regarding successes and frustrations, with successes and the associated feelings of excitement and achievement being mentioned with the highest frequency. When teachers described their successes in general terms, they referred to the incremental nature of the progress they had achieved, and they noted that different students achieved different levels of success. Strategies that teachers used to achieve success included offering incentives such as food or a choice of rewards, using PECS, adhering to prescribed intervention strategies, organizing classroom schedules into consistent routines, and modifying pre-existing classroom routines to meet student needs and facilitate the proper implementation of interventions. When participants reported feelings of frustration, these feelings were associated with students' failing to make expected progress, students' negligent treatment of classroom materials, student behaviors unrelated to schoolwork, and Proloquo, which was considered difficult to use.

The second research question was: What barriers do special education teachers perceive with AAC usage among students with ASD in their classrooms? Student barriers to AAC implementation fell into four categories: difficulties with comprehension, difficulties with expression, violent behaviors, and resistant behaviors. Some students with disabilities experienced difficulties with an understanding of the intervention. Teachers also reported encountering significant barriers in trying to teach their ASD students to label and express their own emotions and even physical sensations. Self-expression in an English-medium school was also difficult for students whose first

language was not English. Violent behaviors were another significant barrier to the smooth implementation of AAC implementations. Other resistant behaviors were milder, as with students who repeatedly left the classroom or "shut down" (Participant 4).

The third research question was: How are conditions for change being met in support of teachers' implementation of AAC interventions? Conditions for change discussed by participants were knowledge and skills, time, resources, participation, and leadership. Participants brought a considerable knowledge- and skill-base to the classroom, but all believed that they would be more effective if they had additional training. Participants expressed satisfaction with the material resources that were made available to them, but the responsibility of creating pictures for PECS was often burdensome. One participant mentioned that the time available to her was inadequate. Participants also spoke appreciatively of their leaders and the participation of their aides. Chapter 5 will describe the findings and connect them to current literature and the conceptual framework used social and practical implications of these findings, and recommendations for future research.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this qualitative case study was to explore the perceptions of special education teachers regarding AAC implementation and usage. The AAC is an intervention used for dealing with children who fall along the autism spectrum disorder (Odom et al., 2010). School districts are increasingly struggling with students who fall somewhere along this spectrum (Finke et al., 2009; Suriopoulous-Dell et al., 2012). Given the increasing numbers of students falling along the spectrum, various stakeholders increasingly devised attempts to try and meet the needs of this population through new interventions and services (Koegel et al., 2012). The AAC is one intervention that is specifically designed to improve access and involvement within a classroom for children who have autism (Light & McNaughton, 2012). Implementation can be accomplished through devices such as iPads and speech generating devices, which play a key role in raising the engagement of students who have autism (Odom et al., 2013). The many barriers to AAC implementation create barriers to successfully working with students who fall along the autism spectrum (Charman, 2010; Dingflelder & Mandell, 2011). This study was conducted to further explore how special education teachers perceive the barriers when integrating AAC in the classroom. This study's sample consisted of 6 special education teachers working in six different schools with students who fell along the autistic spectrum in a North California school district. All participants were women with varying years of working with students with ASD. Two participants worked 3 years, two worked over 20 years, and one worked 6 years with special day classes with ASD students. Three participants taught preschool 3-5 year olds, one taught third-fifth grade,

and two taught middle schoolers 11-13 years of age. The different levels included; two non-categorical, three autism only classes, and one special day class with different disorders.

The key findings of the study provided answers to the three research questions that guided the research. The first key finding was that teachers who had experience with AAC implementation described their experiences regarding of both successes and failures. Teachers described the positive impact of AAC interventions and the student progress they observed, including increased communication. However, they also described their failures. These teachers described difficulties implementing curriculum as well as altering student behaviors, among other struggles. The second key finding was that teachers had in common at least four central perceived barriers related to their ability to implement the AAC. These included difficulties increasing student comprehension, difficulties helping students to express themselves, violent behaviors by the students, and general resistance to the AAC implementation.

The final major finding of this study was that there were several perceived conditions for change that could support the implementation of AAC. These conditions included extra time for implementation, the acquisition of appropriate knowledge and skills, the provision of additional resources, the strong support of administration, and increased participation by aides and speech teachers in AAC interventions. Data analysis of major themes regarding both successes and struggles related to AAC implementation will be presented. Also, the interpretation of the findings will be discussed, and a comparison will be made to the recent literature presented in Chapter 2.

Interpretation of Findings

My interpretation of findings was based on the conceptual framework of Ely's (1978) eight conditions of change used to explore the special education teachers' experiences implementing AAC. This study was developed to examine special education teachers' perceptions of which conditions were not being met at the local research setting and their suggestions for change.

RQ1, How teachers describe their experiences with AAC implementation? Teachers described their experiences with AAC implementation regarding successes and frustrations.

Experiences with AAC implementation

Successes. The first theme regarding AAC implementation took the form of successful implementation. Some teachers described their success regarding how their students progressed and noted the moment when students finally grasped a lesson or fulfilled a task they were required to do. Other teachers framed their success as the level of communication they could achieve among their students, including the use of full sentences among autism spectrum students. These students are often unable to speak or express themselves. Communication deficits can range from non-vocal to people who use speech but demonstrates impairments in complex communication such as conversational skills (APA, 2013). According to Kalb, Mathy, and Wodka (2013), 30% of individuals with ASD fail to develop vocal output capabilities, and the use of AAC assists them in developing functional speech. This limited communication ability can have a negative impact on academic achievement, so achieving increased communication can be an

important first step in potentially reducing these negative outcomes.

Other participants described the longitudinal successes as students built success year-over-year and developed greater skills. Success could be incremental and occurred at different levels for students, but it was present. These findings compare to other studies (Kagohara et al. 2010; Travers & Fefer, 2015). Kagohara et al. (2010) evaluated a systematic instruction intervention with speech generating devices (SGD) for increasing picture naming skills for students with ASD. These researchers suggested that the systematic instructional procedures and SGD technology interventions enabled students with limited speech to benefit from this approach in answering open and closed questions. Travers and Fefer (2015) examined the communicative effects of social communication skills with Active Surface (SAS) and SMART Table for children with communication disabilities. The findings indicated varying results for the social communication skills for students. One student demonstrated a slight increase in his social communication level. In contrast, another student's results indicated a high increase in his social communication skills.

Archmaldi, Lancioni, OReilly, and van der Meer, (2012) concluded that the IPod based (SGD) intervention enabled ASD students to engage in more complex and multi-conversational skills. Additionally, van der Meer et al. (2012) found that ASD students increased their communication skills by making specific requests using at least one of these three AAC interventions: manual signing, PECS, and/or SGD.

The special education teachers also described the context in which their success were built, including the tools used for part of the interventions, the technology that was

introduced to support their lessons, and the routines that were developed that helped to facilitate the accomplishment of the lessons. Previous studies into teacher success identified variables that may be conducive to a successful implementation of an AAC intervention (Charman, 2010; Dingfleder & Mandell, 2011), which are (a) implementing evidence-based research regarding classroom interventions and curriculum, (b) time and resources, and (c) administrators experience selecting an effective functional communication intervention. The findings from this study, however, added to the existing literature by identifying specific contextual changes that occurred, which specifically were using an evidence-based intervention (PECS) supported by the administration and the use of instructional aides to assist with AAC implementation. These contextual changes were considered successes as they involved the successful implementation of new technology and classroom routines. Technology-based treatments were used as speech-generating AAC systems to support functional communication skills, to increase students' participation in the classroom, and to teach academic skills (King, Thomeczek, Voreis, & Scott, 2013).

The final context in which teachers described successes was in the modification to their classroom and personal teaching approaches. The use of the technology transformed the teachers' classrooms and practices, which connects to findings from Fletcher-Watson, (2015). Fletcher-Watson reported classroom procedures, class schedules, and instructor roles all had to be adapted to achieve success among autistic spectrum students. By implementing a combination of these changes, the potential to succeed was maximized. Theiman-Bourke, Brady-McGuff, Stump, and Naylor (2016) indicated the features of the

environment might increase communication and engagement using settings that will motivate children to interact with peers, such as snack time. Additional research has indicated that interventions focusing on social and communication development could reduce symptoms and possible change the developmental course of autism (Charman, 2010).

Frustrations. The second theme regarding AAC implementation took the form of the frustrations that special education teachers experienced with the implementation of AAC interventions with their ASD students. One of the most immediate frustrations teachers faced involved students who failed to make expected progress. Student behavior not related to schoolwork often frustrated teachers as well, with teachers becoming concerned by things students said or did that had little to do with classwork. Frustrations also occurred regarding materials and resources, with missing resources posing one form of an issue for teachers. This demonstrates that AAC did not always have an immediate impact on the students' success and this compares to research conducted by Bond, Symes, Hebron, Humphrey, and Morehead (2016) who discovered that the use of AAC does not always have an immediate impact. On the other hand, Mancil and Bowman (2010) determined that the use of AAC do have a significant impact on students' behaviors, which indicates there is a need to examine how the teachers are integrating AAC in the classroom. Lorah et al. (2016) reported that with the use of SGD as an AAC for students with autism, as students' communication increased their aberrant behaviors decreased. Teacher frustrations were not addressed directly in the literature. This study, therefore, presented additional findings regarding teacher frustrations.

RQ2: Student barriers to AAC implementation. Teachers described the barriers they had encountered in implementing AAC interventions with ASD students in terms of *difficulties with comprehension*, *difficulties with expression*, *violent behaviors*, and *resistant behaviors*.

Student barriers to AAC implementation

Comprehension difficulties.

Regarding barriers to AAC implementation, four themes emerged. Difficulties with comprehension involved the students' inability to grasp lessons or even general concepts such as that of free will. Such obstacles made it difficult for teachers to implement lessons and achieve success among students. Teachers could sometimes anticipate difficulties that students might encounter, and overcoming these difficulties was connected to significant achievements and successes that the teachers noted. Comprehension difficulties, therefore, hindered progress, but could also set the foundation for significant breakthroughs. However, there were instances teachers cited in which the students' inability to comprehend the lesson or concept made it seemingly impossible to impart the lesson. In other cases, teachers encountered entire classes who did not seem capable of grasping the lesson. Consequently, comprehension difficulties with students could also be incredibly frustrating for instructors. The existing literature did not address the specific relationship between comprehension difficulties and teacher frustrations. However, research was found that instructing students with autism could be challenging at times (Koegel et al., 2012). The fact that school personnel were frustrated in their attempts to instruct students with autism was consistent with previous research

indicating such attempts were difficult (Hughes et al. 2012; Koegel et al., 2011). Kover, Haebig, Oakes, McDuffle, and Hagerman (2014) described a possible cause with language comprehension skills was the inability with sentence comprehension. Children with autism may have a better word production than comprehension and gesture skills, which is reversed in comparison with typically developing children, (Miniscalco, Franberg, Schachinger-Lorentzon, & Gillberg, 2012).

Expression difficulties. The second theme to emerge regarding barriers to AAC implementation had to do with the difficulties encountered in trying to help students to express their feelings. Other researchers described these same barriers (Mancil & Bowman, 2010; van der Meer et al., 2014). Students on the autism spectrum often had difficulties grasping abstract concepts and teaching emotional expression was consequently a difficult task for teachers. In some cases, students found themselves unable to describe their physical sensations. These difficulties were heightened when students were in states of emotional distress. Further issues could arise when the students' first language was something other than English creating yet another barrier in attempting to help students to communicate.

Individuals with ASD who have the inability to express themselves were previously noted in the literature as a complicating factor that could severely hamper the student's performance in school, both academically and socially (Hughes et al., 2012; Shattuck et al., 2011; Wei et al., 2014). This body of research indicated that limited communication was detrimental to relationships with both teachers and peers. A decreased amount of social interaction was tied to social rejection, academic declines,

and a general lowering of classroom performance. For all these reasons, the struggles that teachers noted in this study in helping students to express themselves should be an ongoing cause for concern that needs to be addressed. The findings of my study add to the existing literature concerning the troubles that arise from low communication skills.

Violent behaviors. A third theme that emerged regarding barriers to AAC implementation regarded violent behaviors by students, who could occasionally become physically aggressive. These behaviors were often an attempt to communicate but involved physically asserting themselves with teachers and sometimes other students. At other times, these physical displays were attempts to express themselves in friendly ways but involved potentially harmful behavior nonetheless. Finally, students occasionally acted aggressively out of sheer frustration or impatience.

Previous research indicated that children on the autistic spectrum who lack communication skills often have complications regarding behavioral, social, and academic development (APA, 2013). The finding that violent behavior arose at times is, therefore, consistent with the current literature (Mancil & Bowman, 2010; Wong et al., 2015). Teachers in this study noted that such behavior was often an attempt to communicate rather than be an expression of frustration. At times, this type of behavior was a way of simply communicating, while at other times it was an attempt to communicate affection, but both attempts at expression exhibited violent behavior. This finding was consistent with the existing literature regarding the behavioral problems that can arise when autistic children cannot express themselves, leading to challenging behavior (Shattuck et al., 2011; Wei et al., 2014; Wong et al., 2015). Bond et al. (2016)

conducted a systematic literature review of the evidence of research and best practices for educational interventions for students with ASD. The researchers examined the utility and the effectiveness of interventions implemented in the primary school setting. The review included studies that focused on the core features related to ASD students: social outcomes, reducing challenging behaviors and communication skills (Bond et al.). Students with ASD need effective functional communication skills to express their needs, wants, and feelings.

Resistant behaviors. The final theme that emerged regarding student barriers to AAC implementation included student behavior that resisted teacher efforts. This behavior was typified by violent behavior, as in the third theme, but instead was characterized by behaviors that were designed to avoid teacher instruction. This could include students walking out of the room, students who simply stopped responding to teachers, and in some cases simply involved students who lacked the drive to fulfill their tasks for that day. These were all examples of behaviors students adopted, which in some cases were purposely designed to avoid instruction, which made it far more difficult for teachers to communicate their lessons. Research on challenging behaviors also included resistant behaviors in the group of challenging behavior. The research on the challenging behaviors exhibited by ASD students included different descriptions of resistant behaviors (Martinez et al. 2016 & Bond et al., 2016; Walker & Snell, 2013).

Walker and Snell (2013) recommended interventions which target communication skill development could result in the reduction of challenging behavior. These authors reported that challenging behaviors function as ways individuals with ASD attempt to

communicate (Walker & Snell (2013). These challenging behaviors were described as (a) distracting behaviors (walking out class, ignoring, saying "no" to others), (b) stereotypical behavior (pacing, rocking), and (c) behavior that deviated from typical individuals of the same age.

Martinez, Werch, & Conroy (2016) examined school-based interventions targeted on challenging behaviors exhibited with ASD individuals. The challenging behaviors were presented into three categories: destructive (pushing, biting, kicking, hitting), disruptive (crying, yelling, humming, singing), and stereotyped behaviors. These authors concluded that challenging behaviors could be reduced with interventions implemented in the school settings. Also, Bond et al. (2016) divided challenging behaviors into categories: distracting behaviors (walking out of class, ignoring, saying "no" to others), stereotypical behavior (pacing, rocking, etc.), and behavior that deviated from typical individuals of the same age. Interventions that increased the functional communication skills of students with ASD could increase their ability to communicate with others in their home and school settings.

Challenging behaviors have previously been linked to a lack of communication skills (Shattuck et al.; 2011; Wei et al., 2014; American Psychiatric Association, 2013). Special education teachers in this study did not explicitly link resistant behaviors to attempts to communicate, but previous research has suggested that such behaviors may arise from that inability. The current study identified several forms of challenging behavior ranging from ignoring teachers entirely and completely avoiding teachers. Further research would be required to determine if such actions were linked to

communication inability, but the current study discovered behaviors that may be indicative of that inability.

RQ3: How conditions for change are being met in support of teachers' AAC implementation.

Interpretation of research question three involved analyzing all themes identified through coding. These themes included Ely's (1978) eight conditions of change. These themes were discussed connecting it to current literature and the conceptual framework. Conditions for change discussed by participants were time, knowledge and skills, resources, participation, and leadership (Ely, 1990). According to Ely (1978), all eight conditions do not have to be met for an innovation to be implemented.

Supportive conditions for AAC implementation

Availability of time. Ely (1978) stressed the importance of paid time to learn, plan, adapt, integrate, and reflect on the implementation process. In this study, the first of five themes to emerge regarding supportive conditions was the theme of time. Extra time was desired by the participants and was helpful for special education teachers, who often used the time to plan further and prepare for the teaching week. Previous research indicated that time was an important condition for change (Ely, 1990). This study supported that previous finding and a lack of time frustrated efforts to effectively prepare for ACC implementation. When additional time was provided, special education teachers used this time for setting up new technology or preparing for art projects. However, extra time was not always available, even if desired. Even when afforded extra time, teachers could feel frustrated by the sheer number of duties they were required to fulfill. From

communicating to parents to collaborating with other agencies regarding their students, the number of duties teachers had to fulfill could seem overwhelming even when afforded extra hours. Additional preparation time remained a strong desire of these teachers.

Research into the barriers related to the implementation of the AAC is limited, but previous research indicated that a lack of time hinders effective change and academic instruction (Alquranini & Gut, 2012; Ely, 1990;). The findings of this study confirmed previous work in this area and indicated that teachers consider additional time for staff meetings, training, and preparing teaching resources, as necessary to best address the needs of students on the autistic spectrum (Alquranini & Gut, 2012). Teachers may not have the time to participate when provided access to training. This barrier also requires more time to learn how to implement the specific AAC intervention skills.

Existence of knowledge and skills. Ely (1990) clarified that sufficient knowledge of the intervention was one of the most important factors in successful implementation. The special education teachers' in this study were highly qualified and trained, but indicated that they could have used additional training related to integrating AAC successfully. They also believed such training would make them more effective. Sometimes this had to do with additional training for tools they were provided. At other times, teachers simply wished for continuing development to keep their skills honed. New developments in the teaching field afforded continuing opportunities for learning that these teachers hoped to take advantage of. Previous research has indicated that teachers may lack the type of knowledge and experience required to properly implement

the AAC (Barnhill et al., 2011; Hendricks, 2011; Reppond, 2015). A lack of such knowledge can be detrimental, as achieving change relies on the acquisition of certain knowledge and skills (Ely, 1990). The teachers within this study seemed to agree that they required ongoing training and education in this area to improve their implementation of AAC and their ongoing work with students who have autism.

The importance of possessing the appropriate amount of training is indicated in previous studies revealing that school personnel are often challenged by the requirements of providing an effective intervention (Hughes et al., 2012; Koegel et al., 2011; Stephenson et al., 2012). Educators and specialists alike can struggle with understanding how to implement interventions or select specific interventions for use with autism spectrum children. Lack of such knowledge impacts a teacher's overall ability to perform effectively in a classroom when instructing students on the autism spectrum (Hendricks, 2011).

There are also expectations from the Council for Exceptional Children that teachers possess certain baseline pedagogical skills and mastery of their academic area (CEC, 2014). Again, the teachers in this study, while not necessarily aware of these previous findings, suggested that they understood the importance of ongoing training and education to better implement the AAC intervention. The findings of this study suggested that while teachers may be competent to teach, they desired additional training specifically related to the use of AAC.

Availability of resources. Ely (1990) connected resources to what is required to make an implementation work. Ely's examples included hardware, software, media,

teaching materials, and assistance for the adaption of technology in the classroom. Special education teachers in this study struggled with resources in several ways. When students lost materials, it made it difficult for teachers to instruct students. At other times, the need to assemble resources required additional time for teachers, which demonstrated a correlation between the two barriers of time and resources. These two barriers could compound with one another, which is a common finding in literature related to integrating and technology in the classroom (Travers & Fefer, 2017; Barnhill et al., 2014). Teachers would assemble resources only for students to lose them the next day, and acquiring new resources was difficult. Teachers appeared to be in a constant cycle of assembling resources losing them and then having to construct more, leading to increased frustrations. This made the teachers that much more grateful when schools were provided with working resources. The more resources directly supplied by the school, or the more money made available to assemble these resources, the easier it was for teachers to integrate AAC in the classroom.

Teachers in this study focused on resources that needed assembly and were used directly by students, while previous research focused on resources that were technological in nature and meant to supplement speech and communication (Beukelamn & Mirenda, 2013; Costigan & Light, 2010; Fager et al., 2012b). These findings indicated that regarding resources, teachers were most concerned with physical resources that involve many parts, which can be lost. This ability to lose components of the resources created the greatest concern for participants.

Leadership. Ely (1990) stated that leadership included two components;

leadership from the executive offices of an organization, and the project leader who was related to the day-to-day activities of an implementation. Therefore, the fourth theme that emerged in this study was the desire for supportive leadership. Teachers reported that administrators bought into the program and helped them receive further training. Administrators were noted as driving the program, receiving feedback, and adjusting the AAC implementation program to make it more effective. Teachers were afforded the time to receive training, their classes were taken care of while they were gone, and the entire expenses and training were paid. Supportive leadership was cited as being welcome and helpful in increasing the effectiveness of these instructors in implementing the AAC interventions (Alquranini & Gut, 2012). Previous research indicated that leadership and stakeholder buy-in forms an important part of helping work with students with autism (Kucharczyk et al., 2015). This form of buy-in impacts the feasibility, fidelity and fitness of the intervention's implementation. This study revealed that teachers agreed such buy-in was important from administrators. Previous research indicated that increased participation from school leaders was an important factor in encouraging academic success among students with autism (Kasari & Smith, 2013; Simpson et al., 2011). The results indicated that teachers' perceptions were in alignment with previous findings in the literature. Instructing ASD students requires participation and buy-in from administrators, which can impact the program's effectiveness.

Participation. Ely (1990) considered this condition as one of the most important factors of implementation. This final theme that emerged in this study regarding supportive conditions for AAC implementation was participation. Teachers welcomed

higher levels of engagement by their aides as well as speech teachers, who could assist in the implementation of the AAC intervention. This helped distribute the workload and provide multiple voices regarding AAC implementation. Aides sometimes attended additional training in some form, either officially or under the guidance of the instructors. Teachers indicated that this helped them feel comfortable with aides implementing the AAC interventions and dealing with students on the autistic spectrum.

Previous research revealed teachers desired additional commitment from various stakeholders and higher levels of participation from those stakeholders, which teachers found critical to achieving academic success among students with autism (Fields, 2015; Kucharczyk et al., 2015). This research has focused on the role of students' families, school leaders, and colleagues. The role of an aide in this area has been less robustly investigated, with the little research into their role in AAC implementation. This study indicated that teachers greatly appreciate higher engagement from these aides. Special education instructors are traditionally required to spend at least a year receiving mentorship from an experienced special education practitioner (Professional Standards and Practice Policies and Positions, n.d.).

Limitations of the Study

This study was limited in scope to special education teachers' perceptions. Geographically, this study was limited to teachers drawn from one Northern California school district. Further, there was a sampling limitation inherent to the nature of a case study. These studies included only a small number of participants, limiting the generalizability of the findings and making it difficult to transfer those findings into other

settings or onto larger populations. I attempted to increase the transferability by providing detailed descriptions of the research findings, but the limitations remain inherent. No attempts to determine causality or correlation were attempted in this study. Therefore, while data were drawn, there could be no direct connections or inferred connections drawn from between variables and potential successes or failures regarding the implementation of the AAC.

Recommendations for Future Study

The current study was a case study with few participants to focus on rich data drawn from the sample. This data was drawn through qualitative interviews and examinations of teacher work journals. The findings did leave ample room for future research based on the themes that emerged. that might influence success and failure in the implementation of the AAC or similar interventions. This study could be extended and contributed to the knowledge base of implementation of AAC interventions for special education teachers who work with students diagnosed with ASD.

My study identified several potential conditions linked to both successful and unsuccessful implementation of the AAC for special education teachers. Future studies could validate conditions such as administrative support or increase preparation time over several study iterations. Such a study would determine other conditions or factors associated with success and failures in other geographic areas with different dynamics from this research cite. Also, ASD is widespread and impacts students with ASD and different settings and educational resources.

The results of a future study could provide additional information on the special education teachers' perceptions regarding AAC functional communication skills with their students with ASD. The findings could answer questions on the following questions; If AAC training increased their knowledge? If their skills improved and the effectiveness of their AAC implementation increased? If additional time and resources were provided by the administration and improved their class preparation? and if paraprofessionals (aides) became more effective with AAC implementation? Overall, the findings could be shared with the administrators to assist them in planning the budget for needs of the autism spectrum disorders classrooms.

Implications of the Findings

The findings of this study uncovered several successes as well as challenges regarding the implementation of an AAC intervention for children on the autism spectrum. The chance for positive social change existed given the number of successes that were identified among teachers, indicating the ability for the AAC to improve instruction among children with autism. However, those successes came with several caveats.

Stakeholders. One of the conditions required for effective implementation of this intervention was buy-in from stakeholders. Previously in the literature, school officials and parents were identified as stakeholders in the implementation of an intervention (Kucharczyk et al., 2015). However, the participants also included classroom aides to the list of stakeholders. Aides assist and can play a powerful role in the smooth running of a classroom and implementation of an intervention, with many teachers in this study noted

the positive role of aides in assisting in instruction. This could be replicated within other schools by ensuring appropriate training is conducted among aides, leading to more effective teaching for autistic spectrum students. Administrators provide another level of support above that of the special education teacher and can play a powerful role in funding instruction and produce a more effective classroom. In practice, special education teachers indicated that increasing schoolwide support for teachers could facilitate their success in the classroom, which was consistent with statements already in the research (Kucharczyk et al., 2015). Special education teachers indicated that a lack of support frustrated attempts to effectively implement interventions, which was again consistent with previous research indicating that teachers' stakeholder buy-in was a major barrier to effective instruction (Ely, 1978).

Resources. Positive changes in the classroom can also be accomplished when a school provides additional time, resources, and training. All three have been previously noted as important in helping effectively introduce interventions ((Baxter et al., 2012; Bruce et al., 2011; Stoner et al., 2010). When the resources constraint on teachers is alleviated and additionally time is available for the preparation of lessons, interventions can be delivered more effectively. The special education teachers in this study noted that their time and resource needs were met, with some exceptions. Providing instructors with these essentials while giving them the training necessary to implement an intervention is critical to producing a positive change for autistic students.

Implications. Schools that provide additional resources and leadership support could produce more effective implementations of interventions in the classroom. Special

education teachers would benefit from the additional support and be more closely able to address the needs of students with autism in their classroom. Students with autism would benefit because successful implementation of these interventions would facilitate increased communication between them and their instructors. This increased communication would support their academic success. Finally, society at large would benefit from a generation of students with autism who were more clearly able to communicate and succeed within their schools, potentially extending their ability to succeed in society.

Introducing a new intervention such as the AAC requires a shift in the way classrooms are run, and in how teachers operate, something instructors in this study noted. This connects with Ely's (1990) findings and the Conditions for Change theoretical framework, which suggested that knowledge and skills are required to effectively implement change. These findings suggested that appropriate special education teacher training should not be overlooked when attempting to implement the AAC in schools.

The results of future study could provide information on the special education teachers' perceptions regarding AAC functional communication skills with their students with ASD. The findings could answer questions on the following questions; If AAC training increased their knowledge? If their skills improved and the effectiveness of their AAC implementation increased? If additional time and resources were provided by the administration and improved their class preparation? And moreover, if paraprofessionals (aides) became more effective with AAC implementation? Overall, the findings could be

shared with the administrators to assist them in planning the budget for needs of the autism spectrum disorders classrooms.

The findings of this study and future attempts to determine conditions between intervention success and failures mirrors attempt already taken to determine other factors, conditions, and general teacher success. Therefore, any such studies would add to the existing body of literature regarding research into teachers and the conditions influencing their efforts. Future studies examining the implementation of the AAC would produce results determining whether the same conditions are influencing teacher success overall also impacts special education teachers in their implementation of interventions. Differing results would also suggest areas where the implementation of such interventions was unique and faced unique challenges from those facing the general teaching population. Following increased stakeholder support and the introduction of further resources, a comparison of outcomes could be conducted to determine whether these interventions were successful.

Recommendations for Practice

In this study, I examined the special education teachers' perceptions of the challenges associated with implementing functional communication skills among ASD students. Results demonstrated an emphasis on improving these conditions for special education teachers to become more effective with the implementation of an AAC intervention. The specific conditions special education teachers expressed were; a perceived need for more time, resources, knowledge and skills, and investment from various stakeholders. The results will provide the administration and special education

teachers ways to overcome these challenges in educating students with autism. I recommended that resources should be provided to special education teachers for materials and on-going autism specific training. Also, I recommended more time should be allotted in special education teachers' schedules for preparation time, related duties, and time for professional development training related to educating ASD students. Teachers considered additional time as necessary to best address the needs of students on the autism spectrum (Alquranini & Gut, 2012). The participants desired additional training regarding AAC implementation to increase their knowledge and skills with the implementation of AAC interventions. Additionally, special education teachers emphasized more training for tools and technological interventions provided.

Special education teachers included buy-in from stakeholders as a condition required for effective implementation of the intervention. Classroom aides were also considered as stakeholders and contributing to smooth running of a classroom and with implementing AAC interventions. Aides were included because the teachers felt they play a powerful role in the smooth running of a classroom and implementation of an intervention. I recommended that the administrators ensure appropriate training is conducted among aides, leading to more effective teaching for autism spectrum students. Also, a follow-up study could be conducted to determine if perceived barriers changed.

The students with ASD who use functional communication skills (AAC) will experience more positive communication interactions and increase their social and academic opportunities. Functional communication skills contribute to forming relationships, and in the expression of feelings, thoughts, and needs. Therefore, students

with ASD could use their functional communication skills to become more involved with their community and possibly increase their independence.

Conclusion

The purpose of this qualitative case study was to examine the perceptions of special education teachers regarding the implementation of an AAC intervention. The existing literature mostly did not discuss the obstacles teachers face, however, what research existed indicated that teachers required an investment from various stakeholders as well as resources such as time and increased training. The conceptual framework chosen for this study emphasized the need for knowledge and skills to effect change. In the literature, there was a similar emphasis on improving these two conditions for teachers to become more effective at implementing an intervention. The findings of this study closely compared to previous research and the existing framework. The specific connections were that teachers have the perceived need for more time, resources, knowledge, and investment from various stakeholders.

The findings for this study did add to the existing literature in the successful implementation of AAC interventions. This study revealed that the implementation of an AAC intervention could be successful, although teachers perceived that certain conditions must be present to help achieve that success. However, this study also revealed that the perceived barriers teachers encountered, caused a level of frustration. These included student behaviors (aggressive and resistant), as well as the loss of resources. The loss of resources was not addressed in the literature, although previous findings did indicate that lack of communication skill could lead to unwanted behavior

among students with autism spectrum disorder. My study identified specific forms of behavior that occurred and ways that these behaviors frustrated teaching attempts. The inability for students to express themselves was also noted as a frustration but was a finding largely consistent with an extensive body of research into autism spectrum disorder student behavior. Effectively implementing an AAC intervention relies on increasing student communication while increasing various supports (both regarding time/resources and stakeholder support). Minimizing frustrations and maximizing supports may be conducive to successful implementation of an AAC intervention, although correlations between these variables and outcomes are left to future study.

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Appendix A: Interview Protocol

The purpose of this interview is to further my understanding of your perception of implementing functional communication skills/ Augmentative and Alternative Communication (AAC) interventions. It will contribute to my study evaluating the barriers special education teachers experience during this process. For the purpose of this interview, the term AAC indicates either high or low technology used to supplement or replace functional communication speech.

I want to remind you again that this interview is confidential, and your identity will remain anonymous. Your honesty will be greatly appreciated, and is taken without judgment. Your experiences are valuable and will contribute to this study and the field of communication disorders. Lastly, your participation is voluntary and you have the right to end this at any time. Do you agree to continue?

1. How long have you been teaching? Where did you do your training? How long have you been at (X school)/teaching special day classes with ASD students?
2. Please tell me about your formal training and/or education in AAC implementation.
3. Describe your experiences with implementing functional communication skills interventions. How, specifically, have you used AAC interventions?
4. How do your students access their AAC? Can you give me some concrete examples? How are your students able to use their AAC to meet their needs? Express their feelings? Interact with adults and peers?
5. In what ways do your students struggle to access their AAC? Can you give me some concrete examples? How are your students unable to use their AAC skills to meet their needs? Express their feelings? Interact with adults and peers?
6. Tell me about any differences you've noticed with students accessing their AAC skills in terms of their age or background (SES, parent education, etc.).
7. How would you characterize the overall results of your AAC interventions? Please tell me about any challenges and any successes you've experienced using these interventions with your ASD students.
8. In what ways are your present skills for implementing functional communication skills effective? When do you feel like your implementation is most successful? When do you feel like it is not working?
9. How would you describe your need for acquiring additional knowledge and skills to better implement functional communication skills interventions?
10. How, if at all, are the availability of time and availability of resources critical to your learning and implementing AAC interventions?
11. In what ways, could you be more effective in implementing AAC interventions?
12. What resources have helped you effectively use AAC in the past (time, funding, mentors, trainers, materials, etc.)?
13. Please tell me about any other functional communication interventions and strategies you use with your students.

14. Describe your experience with the process involved with ACC interventions? Please include who was involved, how decisions were made, and who made these decisions Who initiated the process and what made this process easier or more difficult? In what ways, would you improve this process, if at all?

Potential Prompts if needed:
Can you explain?
Can you give me more examples?
What other things do you consider----?

Appendix B: Special Education Teachers Work Journal Prompts

Teacher AAC implementation- setting:
- During circle time
- During individual sessions
- During small group sessions
- While circulating the classroom environment
- Other

AAC structured implementation duration- duration:
- 5-10 minutes
- 15-20 minutes
- 30 minutes
- Other times
- Did you have scheduled the time to implement AAC?

Sources and materials used- type of AAC implemented:
- AAC high technology devices and applications
- AAC low technology
- Individual's own AAC device
- Other teacher made communication skills materials
- Miscellaneous materials

Implementation experience- challenges/successes with AAC implementation:
- Nature of student engagement
- Behavior during implementation
- Effectiveness of AAC?
- Effectiveness of AAC implementation?
- Other

Observations of students' use of functional communication skills throughout the day.
How did the student use their AAC?
- Expressed needs-breaks, restroom, sick, tired, etc.
- Expressed feelings-emotions of frustrations, mood, desires, etc.
- Interactions with peers and adults
- Other

Please describe your AAC implementation process today.
What specific challenges and successes did you experience today?
What, specifically, contributed to any effective AAC implementation today?