

TEACHERS' SELF-EFFICACY AND AUGMENTATIVE AND ALTERNATIVE  
COMMUNICATION TECHNOLOGY USE

by

Tamara Therese Parks

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

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## ABSTRACT

Students identified with disabilities and complex communication needs (CCN) add a unique aspect to pedagogy. Both special education and general education teachers play a vital role in providing opportunities for students to learn and succeed. Using augmentative and alternative communication (AAC) devices is one way for students with CCN to access the general curriculum and become active participants in the classroom. Research indicated that teachers' self-efficacy with AAC devices was a predictor of their use of the devices in the classroom. Despite having to provide support to students with CCN, research shows they continue to have difficulty doing so. Given teachers' role as primary communication partners for students with CCN, research must investigate teachers' self-efficacy to use AAC devices in the classroom on a wider scale. The purpose of this quantitative, predictive, correlational study was to determine if teachers' self-efficacy could predict their intentions to use AAC in their classrooms and their perceptions of their students' ability to communicate effectively as measured by subscales of the Teacher Attitudinal Scale toward AAC instrument (TASTA).

*Keywords:* augmentative and alternative communication, self-efficacy, teachers, complex communication needs, general education, special education, TASTA, bivariate regression

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### **List of Abbreviations**

Assistive Technology (AT)

Augmentative and alternative communication (AAC)

Complex communication needs (CCN)

Individuals with Disabilities Education Act (IDEA)

Teacher Attitudinal Scale toward AAC (TASTA)



## **CHAPTER ONE: INTRODUCTION**

### **Overview**

The purpose of this quantitative, predictive, correlational study was to determine if teachers' self-efficacy could predict their intentions to use augmentative and alternative communication in their classrooms and their perceptions of their students' ability to communicate effectively. Chapter One includes the background section for the areas of teachers' self-efficacy, individuals with complex communication needs (CCN), and utilizing AAC devices as assistive technology (AT). The background section also includes a discussion on the experiences of general education teachers and special education teachers use of AAC in their classrooms and their ability to meet communication needs of students with CCN and an overview of the study's theoretical framework. The next sections of Chapter One are the problem statement and the significance of the study sections. The problem statement section will include a description of the gap in knowledge. The final sections of Chapter One are the research questions and definitions of key terms.

### **Background**

Students with disabilities have not had equitable access to the general education curriculum over the years (Bouck, 2016; Østvik et al., 2018; Schaaf, 2018; UNESCO, 2020). The passage of the Education for All Handicapped Children Act (1975) was a significant step in providing students with disabilities equitable access to the general education curriculum; however, limited access to general education for students with disabilities continued, with many being placed in the most restrictive environments (Bouck, 2016; Kleinert et al., 2015). The Individuals with Disabilities Education Act (IDEA), which Congress reauthorized in 2004 and amended in 2015, was enacted to prevent inequitable education practices in school systems

across the United States and to ensure students with disabilities had access to the general education curriculum (Every Student Succeeds Act, 2015). IDEA also required the roles of general and special educators to change, with special educators working as case managers and co-teachers and teaching in self-contained classrooms while general educators needed to expand their pedagogical expertise to meet the needs of diverse learners (Koh & Shin, 2017). Educators still struggle to meet the diverse needs of many students with disabilities, though there are positive attitudes toward the practice of inclusion. Many students with disabilities have CCN, experiencing impairment and insufficiency of speech and language requiring interventions and additional supports (Sigafoos & Gevarter, 2019).

Usually, students with CCN have a comorbid diagnosis such as autism spectrum disorder (ASD), cerebral palsy, and traumatic brain injuries (Department of Communities, Disability Services, and Seniors [DCDSS], 2018). As the knowledge of disabilities like ASD continues to increase, teachers are expected to meet the growing communication needs of students to ensure successful instruction. Students with CCN often require modifications and supports to participate in the classroom but teachers' approaches tend to be inadequate (Brady et al., 2016). To support students who struggle with communication, teachers should use AT. The Assistive Technology Act of 2004 was one of the initial steps of recognition, emphasizing the necessity of AT for students with disabilities to build and maintain functional skills (Assistive Technology, 2013; Schaaf, 2018). This is perhaps most notable, as the use of AT would allow students with disabilities more access to general education settings and curricula (Kleinert et al., 2015).

Students with CCN often use an augmentative and alternative communication (AAC) device, which is a type of AT tool (Andzik et al., 2018). AAC devices, which may also be referred to as speech-generating devices, provide students with more meaningful communication

opportunities when used with regularity (McNaughton et al., 2019). When creating individualized education plans (IEP) for students with CCN, the IEP team must provide AT devices and services to students who need them (IDEA, 2004). However, AT services for students go beyond accessibility to devices, including access to trained, knowledgeable professionals who can help students use an AAC device efficiently and effectively (Laughlin et al., 2018). Outside of speech-language pathologists (SLPs), teachers interact with and provide services for students using AAC devices. Consequently, it is imperative for teachers to understand and implement best practices of AAC use. The Tech Act, or the Assistive Technology Act of 2004, reinforced the necessity of teachers having experience with the AT accommodations and necessary supports that are often included in the IEPs of students with CCN (Schaaf, 2018).

Unfortunately, teachers' continued lack of proficiency, training, and access continue to be prohibitive in increasing use of AAC devices in the classroom (Andzik et al., 2018; Bouck, 2016). In addition to other barriers, successful AAC use continues to be problematic for students who require it to interact with others and the environment around them. Communication is a basic need for each person and a vital way to connect with others. Communication encompasses making requests, asking questions, sharing ideas, protesting, and comprehending new learning and worldviews. All these descriptors hold true for students with CCN who often need interventions and accommodations to make social connections, learn content, and participate in the learning process. Teachers are primary communication partners for students with CCN, helping to bridge the gap between the educational experience and student learning (Caron et al., 2016; DCDSS, 2018). Teachers continuously engage with students throughout the school day, communicating instructions, assistance, and social expectations. As such, they are considered

primary communication partners. Even with the mandates of IDEA (2004; Assistive Technology, 2013), teachers continue to fall short of providing the necessary interventions and supports needed by students with CCN. This is problematic since IEP accommodations, including regular use of AAC devices, are written to ensure students' access to learning in their least restrictive environment. Although Andzik et al. (2017) and Aldabas (2019) found that training, experience, and support from administrators helpful in increasing AAC device use by teachers with their students, inconsistent use of devices continues to be ongoing issue. Researchers emphasized the importance of AAC devices for students with CCN in accessing the general education curriculum (Kleinert et al., 2015). Teachers still struggle with using AAC devices, especially given the lack of support and resources to do so effectively (Saloviita, 2020). Therefore, it is essential to determine whether teachers who work with students with CCN are actually using AAC devices with regularity (or are willing to) and their perceived self-efficacy in working with the students who use AAC devices. The current study builds on Bandura's (1977) theory of self-efficacy, examining how teachers relate to students with CCN and implement accommodations is essential in understanding how they can affect students' educational experiences. As they are expected to use AAC technology with their students, how teachers view their ability to work with both the devices and students may provide insight into potential areas of growth.

In addition to the theory of self-efficacy, the communication accommodation theory (CAT) provides an important framework for the current study to examine the teacher's role in fostering and encouraging effective communication for students with CCN. Communication is an essential component of the educational experience. Giles (1987) recognized communication as a social activity, one which takes place in multiple ways and in multiple places. The strategies developed in CAT focus on whether communicative differences between people are minimized

or maximized (Giles, 1987). Researchers have found that teachers as communication partners tend to maximize differences by engaging in divergence, highlighting the differences in communication ability (Caron et al., 2016; Giles & Ogay, 2007; Kathard et al., 2015). This seems to suggest a negative perception among teachers who work with students with CCN. This approach does not encourage purposeful communication on the part of students with CCN as their opportunities to engage are already limited. As such, using CAT in conjunction with self-efficacy theory provides a framework with which to consider self-efficacy and effective AAC device use.

Most research on AAC use in the classroom and the teacher's role in inclusion has been qualitative in nature (Caron et al., 2016; Fuchs, 2010; Kanjere, 2017; Østvik et al., 2017). These studies provide useful, rich perspectives about self-efficacy and AAC use among teachers and family members of children with CCN. Researchers use the qualitative approach to explore, observe, interpret, and describe participants' experiences regarding a phenomenon (Creswell & Poth, 2018). Though qualitative researchers provide rich descriptions of the phenomenon of AAC use in the classroom, they cannot generalize their findings to the broader population. Often, the studies examine cases or phenomena that are uncommon or extraordinary, focusing on outlier situations (Gall et al., 2007). There have been multiple anecdotes from parents and teachers about AAC use in the classroom (Alkahtani, 2013; Moorcroft et al., 2020; Tamakloe & Agbenyega, 2017). However, pervasiveness of the issue of AAC use and teachers' self-efficacy has not been examined as closely. By utilizing a quantitative approach, this study could provide informative data and analysis about how teachers' self-efficacy can impact their use of AAC in the classroom. Moreover, stakeholders may develop an overall understanding of the relationship between AAC device use (or lack thereof) and teachers' self-efficacy in using them with

students. Using the information from the current study, potential differences between the self-efficacy of general educators and special educators can also be explored in the future, which may provide additional information on how teachers are prepared to work with students with CCN. The findings for this study would be useful in providing insight to plan for students with CCN, leading to studies that focus on future instruction and professional development needs for both special educators and general educators.

### **Problem Statement**

In 2018, almost 7,000,000 students were serviced under IDEA (2004), with approximately 20% of those receiving services due to a speech or language disability (McFarland et al., 2019). Inclusive education has increased in focus and initiative in school districts across country, with many students with disabilities being educated in the general education classroom (Koh & Shin, 2017). With the number of students with CCN increasing annually, increased pressure is placed on both general and special education teachers to meet the diverse needs of these students (Chazin et al., 2018). The utilization of AT, such as AAC devices, to improve student outcomes has become an essential piece of communication and learning. Findings by Erickson & Geist (2016) indicated that about 37% of students with CCN used some method other than speech to communicate. The other media primarily used included AAC devices, which were able to generate speech for communication, providing students with CCN a voice (Erikson & Geist, 2016). Though the need for AAC use can be identified through screening and testing, the quantity and quality of support by teachers as primary communication partners continue to be overlooked in school districts across the country. While surveys have been administered to quantify the number of students with CCN (Andzik et al., 2018), the underutilization of assistive technology for students who need it continues to be problematic

(Bouck, 2016). The attitude of teachers towards students with CCN can impact the continuity of technology use, as well as the competency with which they attempt to use it (Østvik et al., 2017; Woodfield & Ashby, 2015). A study focused on this issue could provide districts and schools with information on how to better train and support their teachers in AAC device use and in turn, their students with CCN. The problem was that research had not adequately investigated the relationship between teacher self-efficacy in working with students with CCN and other disabilities and their use of AAC devices in the classroom.

### **Purpose Statement**

The purpose of this quantitative, predictive, correlational study was to determine if teachers' self-efficacy could predict their intentions to use AAC in their classrooms and their perceptions of their students' ability to communicate effectively. The predictor variable for this study was teachers' self-efficacy while the two criterion variables were teachers' intentions to use AAC devices and their perceptions of their students as measured by the TASTA. Bandura (1977) defined self-efficacy as individuals belief in or perception of their ability to complete a task successfully. Soto (1997) defined intentions to use AAC devices as the likelihood of teachers using AAC with students with CCN in their classrooms while she defined perceptions of students' abilities as the belief that all students could learn and improve communication skills (Soto, 1997).

The population for this study was general education and special education teachers who worked for a large school district in southeastern Tennessee. General education teachers are educators who work with including those in inclusive classrooms (Bateman & Cline, 2016). Special education teachers serve students who qualify for services under Individuals with Disabilities Education Act (IDEA) and have the qualifications to teach in classrooms with

students with disabilities (Bateman & Cline, 2016). By using a quantitative method to investigate teachers' self-efficacy and AAC use in the classroom, the researcher could identify areas for additional research and add context to previous qualitative regarding the phenomenon.

### **Significance of the Study**

This study contributed to the body of knowledge by using a larger sample size, increasing the ability to generalize findings to a larger group. With almost 95% of students receiving services under IDEA in the general education classroom, expectations to meet their unique needs become more significant for general educators (Department of Education, 2017). Teachers must be prepared to provide the necessary accommodations and support to students with disabilities, (Canrinus, 2017). Research has shown that providing support for students with exceptional needs, such as CCN, can be difficult for teachers (Caron et al., 2016). Though teachers are primary communication partners for their students, they struggle with building effective communication, especially those who are more comfortable with didactic methods (Kathard et al., 2015). To become effective communication partners for students requires training and support, teachers must exhibit self-efficacy in learning strategies and implementing them (Kathard et al., 2015).

Hanline et al. (2018) found that teachers felt enabled to use AAC in their classrooms when provided with professional development opportunities. Researchers also found that teachers' self-efficacy in effective communication and AAC device use is essential for positive outcomes (DeCarlo et al., 2019; Hanline et al., 2018). Training can be helpful in this endeavor, but as discovered by Ogirima et al. (2017), lack of consistent implementation of AAC strategies is a problem. Though teachers may recognize the value and importance of using AT with students with CCN, they may lack the confidence to do so, suggesting low self-efficacy.



Supporting students in an inclusive classroom while meeting individual needs seems to intimidate educators. While there is research investigating students with CCN and AAC devices for communication and engagement, research investigating the potential relationship between teachers' self-efficacy with AAC devices and students who use them is limited. Up to this point, research contexts have been limited in scope and the samples have been small. To ensure that students with CCN are receiving the educational support they require, examining how teachers' self-efficacy may predict teachers' intentions of using AAC technology can provide school districts, educators, and other stakeholders with the data necessary to make decisions for better outcomes for students and teachers.

### **Research Question(s)**

**RQ1:** How accurately does teachers' self-efficacy predict teachers' intentions to use AAC in the classroom?

**RQ2:** How accurately does teachers' self-efficacy predict their perception of students' ability to communicate effectively?

### **Definitions**

1. *Accommodations* – Accommodations are changes that minimize or eliminate barriers to provide equitable access to learning (Lee, n.d.).
2. *Assistive technology* – Assistive technology refers to any item or equipment that is used to enhance or maintain functional skills for students with disabilities (Assistive Technology, 2013).
3. *Augmentative and alternative communication (AAC)* – refers to multiple methods that enable communication and compensate for lack of speech (Beukelman & Mirenda,

2013). Types of AAC include using vocalizations, sign language, picture exchange communication, and speech-generating devices.

4. *Communication partner* – An individual who is engaged in communication with someone else (Giles et al., 1987). For the purpose of this study, a communication partner usually refers to a teacher or peer that interacts with a student with CCN.
5. *Complex communication needs (CCN)* – CCN describes the severe impairment and insufficiency of effective speech and language experienced by those with disabilities (Sigafoos & Gevarter, 2019). Individuals with CCN require continuous intervention and supports. It is usually a comorbid disability.
6. *Individualized education plan* – A written document that is developed for eligible students with disabilities to ensure access to a free and appropriate public education. As specified in IDEA (2004), the plan includes current academic levels and performance for a student as well as goals for both academic and functional growth. Supplementary aids (such as AAC devices) and services (such as speech or occupational therapy) that are necessary for a student is documented in the IEP.
7. *Individuals with Disabilities Education Act (IDEA)* – IDEA (2004) is a law that ensures access to a free and appropriate public education to children with disabilities. Under IDEA, children with disabilities receive special education services through the creation of an individualized education plan.
8. *Self-efficacy* – Refers to believing in one's ability to accomplish something based on perceived outcomes and effort (Bandura, 1977). Self-efficacy can be derived from several sources, resulting from a combination of life experiences and learning.

## **CHAPTER TWO: LITERATURE REVIEW**

### **Overview**

This chapter will focus on current literature related to the topic of study: teachers' self-efficacy and AAC technology use. The chapter begins with the theoretical context applicable to self-efficacy and communication. Subsequent sections synthesize current literature discussing teachers' self-efficacy in working with students with CCN, their perceptions, and the teacher's role as a primary communication partner. This is followed by a review of assistive technology, its historical significance, and how it (more specifically, AAC) can be harnessed in the classroom to support students. The chapter concludes with the need for the current study will be emphasized by identifying gaps in the literature.

### **Theoretical Framework**

The theoretical framework provides infrastructure for the study and serves as the foundation for analyzing and synthesizing pertinent literature for the review (Grant & Osanloo, 2014). The theories of self-efficacy and communication accommodation will be used to examine teachers' self-efficacy in working with students with disabilities as well as utilizing assistive technology (AT) in the form of AAC devices. These theories will provide a focused understanding of the topic, connecting the conceptual elements of self-efficacy and communication accommodation to teachers' self-efficacy and attitudes toward AAC.

### **Theory of Self-Efficacy**

While human behavior has long been an interest of researchers, fascination with identifying connections among behavior, environment, and actions became popular in the 1960s (Hayden, 2019). As a result of his own research on these topics, Albert Bandura (1977) established the theory of self-efficacy. Grounded in social cognitive theory, behaviorism, and

social learning theory, self-efficacy is defined as “the belief in one’s own ability to successfully accomplish something” (Hayden, 2019, p. 15). Bandura (1997) offered sources of self-efficacy, such as vicarious and mastery experiences, verbal persuasion, and affective and physiological states. Self-efficacy is not just the product of one experience, but of one’s overall life experiences and learning.

The theory of self-efficacy is not uncommon to educational research, as the interest in teacher experiences and attitudes related to student learning has become more prevalent (Klassen & Chiu, 2010; Koh, 2018; Zee & Koomen, 2016). Specifically, researchers seek to understand what pre-service and practicing teachers believe and how it affects their practice (Klassen & Chiu, 2010; Koh, 2018; Zee & Koomen, 2016). Self-efficacy is important for teachers working with students with disabilities. It is also important for teachers unfamiliar with AT use. As Bandura (1977) posited in his work, self-efficacy is based on perceived outcomes and the effort put forth based on that belief. Investigating teachers’ experience and knowledge of communication needs and AAC devices is necessary to gauge how well these areas are supported in their classrooms. While a teacher with weak self-efficacy may avoid utilizing an AAC device, those with higher motivation may persist in the face of the challenge (Bandura, 1977; Hayden, 2019). Motivated teachers are more likely to seek out resources to help their students (Skaalvik & Skaalvik, 2018).

One key component of self-efficacy is mastery experiences. Teaching experience is important in determining how teachers will perceive their success in future experiences and performance (Ford et al., 2017). Bandura (1986) discussed how perceptions of self is often the result of how individuals judge their behavior in various situations and consider the different outcomes. These perceptions can be clouded by the active environments found in school and

classroom settings. Teachers' experiences tend to be dynamic, with positive and negative experiences. As Bandura (1986) further discussed self-efficacy, individuals may very well be able to perform tasks but be impeded by negative perceptions of their own abilities. Educational researchers have used this knowledge to conduct self-efficacy studies, focusing on perceptions of performance raising or lowering teachers' perceived self-efficacy (Bandura, 1986; Koh, 2018). Using self-efficacy theory to guide research on educators' perceptions and intentions continues to be a strong choice in various areas of educational research, including work with students with disabilities.

### **Communication Accommodation Theory**

Originally called "speech accommodation theory," communication accommodation theory (CAT) was established in 1973 by Howard Giles. This theory was borne out of interest in accents and dialects in varying social contexts. Over time, it has become more inclusive, addressing all forms of communication (Giles et al., 1987). Communication is basis of meaningful interaction and continues to be evident in educational settings. CAT is defined as how people minimize or maximize communicative differences to convey and derive meaning (Giles et al., 1987). Accommodations for communication include varied approaches to how language is used, timing, and nonverbal communication (Simmons-Mackie, 2018). Communication does not occur in a vacuum; rather, it is affected by context. CAT identifies the various types of communication and their purpose while considering the intentions and motives of those who are communicating (Gallois et al., 2005).

Within CAT, there are strategies used during communication, namely convergence and divergence. These two terms describe the type of accommodation that a person is making when communicating with others (Giles & Ogay, 2007). Convergence takes place when individuals

adapt their communication to become more like their communication partners to foster understanding. Research supports this assertion, as the findings of two studies showed that people often modify how they communicate to match their communication partners (Giles & Ogay, 2015; Simmons-Mackie, 2018). Convergence is important for students with CCN, since it often leads to more positive interactions with others and helps build positive self-esteem (Simmons-Mackie, 2018). Inversely, divergence takes place when one looks to highlight the differences between oneself and the communication partner (Giles & Ogay, 2007). Teachers who engage in more didactic teaching methods seem to utilize divergence with greater regularity. In education, this can be seen in teachers who wish to maintain a distance from their students. Although this can be done with some success, Simmons-Mackie (2018) found that listeners often dislike divergence and feel alienated by people who often use this approach.

Based on the elements of effective communication described in CAT, students with CCN need communication partners that are more convergent in nature (Giles et al., 1987; Giles & Ogay, 2007). With more individuals using AAC to communicate, it is vital that accommodations and opportunities for meaningful discourse are provided in a variety of settings, especially the classroom. Teachers with low self-efficacy may engage in more divergent communication practices, thereby potentially reducing student accessibility to learning. They must be willing to meet students with CCN at their current educational level to ensure students experience effective communication and learning. While communication accommodations require some reciprocity between individuals, the teacher's role as primary communication partner is essential to successful interactions with students with CCN (Simmons-Mackie, 2018).

## **Related Literature**

Meeting the specialized needs of students with disabilities continues to be a relevant topic in educational research. The element of accommodations for students with CCN has become an important issue. Now that AT must be considered an option when working on a student's individualized education plan (IEP), AAC devices are now found in more schools and classrooms. As such, it is critical to recognize teachers' beliefs regarding working with students with CCN and practices utilizing AAC devices. For this study, it is appropriate to examine the literature on teachers' attitudes towards teaching students with disabilities, CCN, and AT to better understand teachers' self-efficacy and how it relates to utilizing AAC devices.

### **Teachers' Attitudes Toward Inclusion and Students with Disabilities**

Multiple research studies have investigated the effects of teachers' self-efficacy on their teaching practices (Oppermann et al., 2019; Perren et al., 2017; Shoulders & Krei, 2016). As school systems work to ensure students are educated fairly and in the least restrictive environment, teachers are expected to meet a variety of needs in their classrooms. This is detailed in the federal requirements of Individuals with Disabilities Education Act (IDEA, 2004) and Every Student Succeeds Act (ESSA, 2015). Teachers' positive self-efficacy has been connected to more confidence in teaching students with disabilities, which results in better educational outcomes for students (Kurniawati et al., 2017; Mngo & Mngo, 2018). In a study by Dapudong (2014), data showed that 84.6% of teacher participants who believed in inclusive practices and had experience in engaging with them were more willing to implement effective practices and accommodations. Teachers were even more likely to implement practices and accommodations when provided with additional support and training (Dapudong, 2014). Self-efficacy was an essential element in how teachers viewed students with disabilities as well as

their willingness to include them in the general classroom. Most teachers stated they had moderate knowledge of inclusive practices, leading to concern of not meeting the needs of special education students (Dapudong, 2014). This seemed to inhibit the ability of the teachers to work with students in the classroom (Dapudong, 2014). This is a common issue that continues to be emphasized in educational research (Kurniawati et al., 2017; Mngo & Mngo, 2018).

Lack of self-efficacy continues to be a barrier to teachers wanting to work with students with special needs as well as to the implementation of strategies that could be effective. Though 34.6% of participants in Dapudong's (2014) research had not received any special education training, there was no significant difference in attitudes between them and those who had attended additional training or workshops (computed p-values of .343, .447, and .543,  $\alpha = .05$ ). This finding is consistent with research by Mezquita-Hoyos et al. (2018), which specifically examined general education and special education teachers' attitudes toward working with students with disabilities. Both groups of teachers reported positive attitudes toward inclusion. Eighty-four percent of general education teachers had experience working with students with disabilities in the classroom and 51% of the entire sample had interactions with students with disabilities, though special education teachers trended more positively (Mequita-Hoyos et al., 2018). The experience and institutional support for inclusive practices were helpful in developing teachers' positive attitudes and self-efficacy when working with students with disabilities (Mequita-Hoyos et al., 2018). Overall, teachers' self-efficacy is a vital part of meeting student needs and employing appropriate strategies.

Preparation and practice are vital to effectively working with students with disabilities in a variety of settings. Kanjere (2017) was able to identify the impact of teachers' knowledge and experience on their work with students with disabilities. With the aim of defining barriers to



effective inclusive practices, some researchers have determined that teachers lack training, contributing to negative attitudes toward inclusive education and students with disabilities (Kanjere, 2017; Mngo & Mngo, 2018). Bandura (1997) examined the idea of inputs and outputs in his theory of self-efficacy. He found that a single input can contribute to behavioral outcomes, but multiple inputs of learning and experience provide a deeper understanding and lead to the establishment of certain beliefs (Bandura, 1997). Teachers' experiences help them decide what actions are appropriate and influence their commitment based on perceived outcomes. Without experience and knowledge, teachers are less likely to use effective teaching strategies for students with disabilities and tend to have negative experiences as a result (Kanjere, 2017; Kurniawati et al., 2018; Mngo & Mngo, 2018). The results of a few research studies reinforce this conclusion, with less experienced teachers being less enthused with the idea of special education students in the general classroom (Kanjere, 2017; Kurniawati et al., 2018, Mngo & Mngo, 2018).

To raise teachers' self-efficacy in working with students with disabilities, some schools and districts have worked to implement additional training to support teachers and ensure quality, educational experiences for students (Koh, 2018; Kurniawati et al., 2017). Koh's (2018) research showed that pre-service teachers experienced the same issues with self-efficacy and the training outcomes also mirrored those of in-service teachers. He focused on including adaptive physical education courses for pre-service teachers, finding a significant relationship between positive self-efficacy and beliefs in teaching students with disabilities ( $\gamma_{00} = 20.37$ ,  $SE = 0.78$ ,  $p < .001$ ) (Koh, 2018). If students took at least 15 credits of the adaptive courses, there was an increase of positive self-efficacy when working with students with disabilities (Koh, 2018).

Self-efficacy has repeatedly been shown to be vital to teachers' work with students with disabilities and the student experience. A study by Kurniawati et al. (2017) supported this assertion, finding that teachers who received specific training exhibited positive attitudes toward inclusive education more than those who had not experienced it [ $F(1,63) = 29.38, p < .01, \eta^2 = .32$ ]. The medium to large effect sizes reported suggested the efficacy of utilizing a teacher-training program to help teachers embrace inclusive practices and accommodations more easily (Kurniawati et al., 2017).

Collectively, these studies emphasize the importance of self-efficacy in teachers and accentuate the suitability of self-efficacy theory to educational research (Dapudong, 2014; Kanjere, 2017; Koh, 2018; Kurniawati et al., 2017; Mngo & Mngo, 2018). Researchers continue to study teachers' attitudes and make recommendations for improvement. Understanding teachers' self-efficacy is crucial, since it directly impacts expectations and performance (Bandura, 1977). Particularly, it is of great import to explore teachers' self-efficacy as it relates to students with disabilities. To best meet their diverse needs, it is necessary to determine how teachers' views of their students as well as their intentions and motivation in meeting their needs. If the goal of effective instruction for students with disabilities seems out of reach, priority of teaching them may become weakened. Teachers' attitudes and self-efficacy would also be negatively affected.

### ***Teacher Intentions***

Teachers' intentions guide their attitudes and self-efficacy. They are essential to understanding how teachers' make decisions about instruction and student supports. Collectively, intentions often represent an important variable often utilized in research (Ajzen, 2002; Subban & Mahlo, 2017). Though mentioned in self-efficacy research, intentions are often found

connected to Ajzen's (1991) theory of planned behavior (TPB), which builds a more comprehensive understanding of Bandura's theory by focusing on the behavioral aspects.

Though TPB is not utilized as part of the theoretical framework for this study, it is important to mention since much research in self-efficacy extensively uses behavior and attitudes as common variables (Sharma et al., 2018; Sharma & Jacobs, 2016). As posited by Bandura (1977), self-efficacy is a robust way to predict behavior. Self-efficacy theory and TPB are closely connected. Researchers must determine the direction of their studies to decide which one is most appropriate.

It is also important to mention how intentions are viewed when compared to how they are perceived through the theoretical lens of CAT. An integral part of CAT is the participation of at least two individuals engaging in communication that is preferably convergent (Giles & Ogay, 2007). However, there are instances where behavioral intentions can be misunderstood by at least one party engaging in communication (Giles & Ogay, 2007). Though this can be unintentional, there are instances where maintenance may occur. Maintenance refers to people adhering to their own style of communication without considering the other parties or their communicative needs (Gallois et al., 2005). The perceived intentions of communication partners become evident when noting the level of accommodation being used in conversation (Gallois et al., 2005). This is true regardless of the medium used to communicate (Gallois et al., 2005).

Teachers' attitudes in working with students with disabilities impact their intentions to plan how to meet their needs. As attitudes are often formed during training, Subban & Mahlo's (2017) study on pre-service teachers found that attitudes toward inclusive education became less favorable the further along they were in their teacher education programs. In other research studies that focus on in-service educators (Columna et al., 2016; Sharma & Jacobs, 2016),

participants generally have a positive attitude when considering the purpose of inclusive education. However, positive intentions diminished as the challenges and barriers of meeting student needs in the inclusive environment became more apparent. It is crucial to include this in ongoing research focused on teachers and students with disabilities, including those with CCN.

### ***Teacher Perceptions***

As teachers have increased expectations in meeting the needs of a variety of students, Teachers are now expected to meet the varied needs of all their students. This expectation has led researchers to focus on perceptions as an important element of understanding teachers' attitudes. This is especially true when considering inclusive education and using AAC devices (Atanga et al., 2020). While exploring perceptions is often a focus in qualitative research, there have been examples found in mixed-method and quantitative research (e.g., Arrah & Swain, 2014; Atanga et al., 2020; Hansen-Thomas et al., 2016; Woodcock & Wolfson, 2019). Though teachers have expressed positive perceptions of inclusive education and working with students with special needs, those perceptions do not necessarily change from pedagogy to active practice (Arrah & Swain, 2014; Woodcock & Wolfson, 2019).

Perception is an essential component of self-efficacy, which consequently informs intentions and resulting behaviors. Bandura's (1977) self-efficacy theory and research clarify that behavior is only repeated when people have perceived that the resulting consequence will continue to be positive. Thus far, the theoretical concept of working with children with disabilities in the inclusive classroom has been met with neutral or positive perception (Bentley-Williams et al., 2017; Dapudong, 2014; Jahnukainen, 2015; Woodcock & Wolfson, 2019). How these perceptions inform practice is an area which continues to require further study. There are

many elements that contribute to teachers perceived self-efficacy and perceptions may impact how teachers work with students with CCN.

### **Complex Communication Needs**

When navigating the challenges of working with students with disabilities, CCN has been considered one of the most difficult (Brady et al., 2016). Communication is correctly viewed as both a basic need and basic right for everyone (Brady et al., 2016). This definition of communication is also true for students with CCN. It is necessary for students with CCN to share what they need, what they know, and what they want to know. Communication has been key to helping them embrace the right to education. CCN is defined as lacking language and speech to interact effectively and efficiently with others (Sigafoos & Gevarter, 2019). It tends to be a comorbid disability and accompanies other disabilities such as ASD, cerebral palsy, and traumatic brain injury (Department of Communities, Disability Services, and Seniors (DCDSS), 2018). CCN affects how an individual understands others. Receptive language is integral to the learning experience for all students and lack of understanding may contribute to low effectiveness of overall communication (Sigafoos & Gevarter, 2019). This receptive language barrier is of special import in the classroom setting, where learning requires a give and take environment. Furthermore, students with CCN struggle with reading and writing, often requiring other mediums to engage in meaningful learning experiences (Sigafoos & Gevarter, 2019).

Students with CCN can be found in a variety of educational settings, though many are in specialized classrooms or schools (Erickson & Geist, 2016). With the advent of the Americans with Disabilities Act (1991) and IDEA (2004), more students with CCN are spending at least part of their day in general education settings. To meet their needs, teachers must find ways to ensure access to general education curriculum by utilizing effective communication

accommodations (Erickson & Geist, 2016). CAT emphasizes this and highlights different types of communication based on the motivations of the communicators (Giles et al., 1987). Within the educational context, it is not unusual to see some teachers utilize divergent strategies, which are meant to emphasize the differences between communicators (Giles & Ogay, 2007). However, as research has shown, it is of greater import for individuals with CCN to engage in convergent interactions (Brady et al., 2016; DCDSS, 2018). Teachers should be seeking to accommodate communication differences for students with CCN.

Another element that is often neglected is the power that language and communication provide. Research has shown that individuals with disabilities are extremely susceptible to powerlessness, meaning their voices and concerns are rarely heard or addressed effectively (Shea, 2019; Tönsing et al., 2019). These issues carry throughout the lifespan. Powerless children with CCN become powerless adults without effective communication skills. When individuals lack the ability to express themselves, the opportunities for engagement and discourse are minimized, further marginalizing an already marginalized group (Tönsing et al., 2019). Educational institutions have a great impact in the lives of all children. Administrators and specialists must assist teachers in viewing CCN through the lens of ability. Whether in specialized or generalized settings, teachers are integral to the process of building effective communication skills with students with CCN.

### **Teachers as Communication Partners and Facilitators**

Students with CCN tend to remain in specialized settings due to their specific needs. Researchers have been highlighting the lack of effective communication partners contributing to more restrictive placements (Aldabas, 2019; Radici et al., 2019). A communication partner is a person who interacts with another person (DCDSS, 2018). Teachers are considered

communication partners for their students and must understand how their communication choices and strategies affect student engagement. Research by Andzik et al. (2018) supports this assertion, finding that higher levels of communication may lead to higher levels of academic engagement when students are provided with the necessary supports (Andzik et al., 2018). Among those necessary supports are effective communication partners, which further emphasizes the importance of teachers' understanding how to accommodate students with CCN.

To become effective communication partners, it is necessary for teachers to consider interactions from the student's perspective. Caron et al. (2016) found that adults tend to focus on their own interests, using their viewpoints to perceive the desires and needs of their younger communication partners. This resulted in adults struggling to engage children with CCN and led to missed opportunities in building communication skills (Caron et al., 2016). This finding corroborates research by Kathard et al. (2015) where teachers that were more didactic in nature were effectively minimizing the number of teacher-student interactions. Without opportunities to engage in meaningful dialogue, student communication became stunted leading to the continuing cycle of ineffective communication (Caron et al., 2016; Kathard et al., 2015).

Employing partner strategies, like those described by Tegler et al. (2019), seem to be helpful in bridging the communication gaps between teachers and students. These strategies include asking open-ended questions, waiting for a child's response, and taking time to respond (Tegler et al., 2019). They are aligned to the convergence strategies discussed by Giles and Ogay (2007) in their explanation of CAT. An investigation by Wadding et al. (2017) revealed that students with CCN are more likely to approach communication partners with which they have the most engagement. This includes teachers, since they see these primary partners almost every day (Waddington et al., 2017). Teachers are influential communication partners and facilitate

interactions that can encourage or prevent students from accessing the curriculum, participating in the classroom, and even establishing social connections (Kathard et al., 2015). There should be ongoing support for teachers to strengthen their abilities to support students that use AAC devices (Caron et al., 2016). Support may help teachers develop positive self-efficacy in learning communication strategies and implementing them.

### **Technology in Education**

Current educational practices emphasize the importance of technology integration in the classroom. Examining the educational field, stakeholders have continued to reinforce the necessity of utilizing technology in the classroom. Educators have been going beyond offering peripheral support to a lesson or unit to practical, embedded approach for technology use. Researchers have found that teachers must adapt to 21<sup>st</sup> century technology, requiring working knowledge and adept experience in technology integration and learning (Roussinos & Jimoyiannis, 2019). This is evident in the burgeoning influence that technology has both in and beyond the classroom. Basic skills that are expected of individuals in the 21<sup>st</sup> century include reading, writing, and mathematics. Now, technological skills have become part of the basic skillset, honing the ability to use technology to think, learn, and communicate as part of the learning experience (Luterbach & Brown, 2011). This is seen in the increase in technology in schools through use of computers, interactive whiteboards, tablets, and assistive technologies.

Even with increased access to technology, many teachers continue to struggle with integration and implementation though they believe themselves to be knowledgeable (Taimalu & Luik, 2019). In some cases, the issue was not related to how the technology works; rather, it is how to effectively incorporate it into regular classroom routines. This is supported by research findings from Taimalu and Luik (2019) on the inconsistent use of technology among teachers. In



an older study, Luterbach and Brown (2011) found that teacher education students needed to work toward acquiring technological skills to customize and design instructional activities that fit the ever-changing needs of students within the modern context of learning. With pre-service training, teachers may be more likely to use technology effectively and with greater familiarity and comfort. Teachers' self-efficacy in technology utilization directly impacts their willingness to learn the necessary skills to integrate effectively (Roussinos & Jimoyiannis, 2019). Research findings indicate that the ability to identify barriers to positive self-efficacy with technology may help teachers become more receptive to assistance (Roussinos & Jimoyiannis, 2019; Taimalu & Luik, 2019). Teachers may also be more inclined to engage in professional development or other learning opportunities to increase their personal comfort (Roussinos & Jimoyiannis, 2019; Taimalu & Luik, 2019).

As more schools enact technology initiatives, expectations of teacher-use rise, especially when working with students with disabilities. Williams et al. (2018) found that both general and special education teachers needed working knowledge of the different types of technology utilized in the classroom. This knowledge is especially important given the rise of inclusive classrooms and STEM initiatives in schools (Williams et al., 2018). Some researchers agree that successful technology use in the classroom is vital to provide students with richer learning experiences (Taimalu & Luik, 2019; Williams et al., 2018). However, technology use can be awkward for teachers whose educational approaches are grounded in traditional pedagogy (Taimalu & Luik, 2019; Williams et al., 2018).

Teachers are expected to understand the importance of AT and utilize AT tools to help students access educational settings and curriculum more successfully than before. New understandings and skillsets must be employed to address the incongruence that AT has brought

to conventional practice. As schools are serving larger numbers of students receiving services under IDEA (2004), technology integration has taken on new meanings and responsibilities. Teachers must now understand the importance of, and utilize tools from, the assistive branch of technology, which helps students access educational settings and curriculum more successfully than before.

### **Assistive Technology and Special Education Laws**

Assistive Technology (AT) can be described as any equipment or item that can be used to enhance or sustain functional skills for children with disabilities (Assistive Technology, 2013). There are many examples of ATs that are used in educational settings, including AAC devices, walkers or wheelchairs, computer software, hearing aids, and more. Understanding the purpose of AT and how it affects student education are foundational to ensure effective use and implementation. As such, reviewing the history and current practice AT use in research is critical.

#### ***History***

For many years, the educational experiences of individuals with disabilities have been challenging. Students were often treated unfairly compared to peers without disabilities. In 1975, the Education for All Handicapped Children Act was the first step to provide an equitable education to students with disabilities (Schaaf, 2018). The Technology-Related Assistance Act of 1988 provided funding for AT for those with disabilities, followed by the Americans with Disabilities Act (ADA) in 1990 that built upon the original law's premise. The ADA (1990) specifically prohibited discrimination of people with disabilities, covers adults, and included protections for children. Even with the passage of both laws, school systems across the country continued to engage in discrimination against students with disabilities. They continued to be

placed in restrictive settings, unable to share educational or social experiences with typical peers (Bouck, 2016; Kleinert et al., 2015). Lack of equal access was not in line with the ideas set forth in the ADA (1990). The Individuals with Disabilities Education Act (IDEA, 2004) was enacted in hopes of preventing and minimizing the discriminatory practices that continued to take place in the educational sector.

IDEA (2004) was a substantial step forward in special education law, focusing on the elements that tend to create and facilitate inequality in educational settings and encouraging solutions. Students with CCN usually receive special services due to communication deficiencies that affect access to learning and interaction. Under IDEA (2004), students requiring accommodations for AAC device use for communication would have greater access to the tool. Students would also have access to supports to use the AAC device efficiently. Using AAC devices would allow students more access to general education classrooms, curriculum, and social interactions with peers in their least restrictive environment (Kleinert et al., 2015). Positive results would lead the field of education to become more balanced for those with challenges.

The Tech Act, also known as the Assistive Technology Act of 2004, was enacted to reinforce acknowledgement of AT needs for students. The goal was to provide students with disabilities with the necessary supports to meet their diverse needs (Schaaf, 2018). Based on historical precedence, the current expectations for educators and technology are expressly declared by the U.S. Department of Education (USDOE) (2017). There is at least one directive that explicitly states that teachers should be ready to use and integrate technology in their classrooms upon entering (USDOE, 2017). This expectation, plus those that are outlined in ADA (1990) and IDEA (2004), have led the education system to foster inclusive practices.

### *Current practice*

Presently, AT is a required consideration in the creation of an IEP. IDEA (2004) reiterated the importance of providing AT devices and services to those requiring it. AT is used to ensure equitable access to educational activities, such as classroom participation and access to the curriculum (Petcu et al., 2014). AAC devices are among the most utilized tools in the realm of AT, as students with CCN outnumber those with more severe disabilities (Erdem, 2017). Previous studies have shown that students who have access to AAC devices experience increased ability to communicate effectively (Rodriguez et al., 2008 as cited in Erdem, 2017). The sections on AT qualifications in IDEA (2004) are being emphasized more as a result. Under the legislation, IEP teams are required to consider AT options for each student with disabilities without exception (Bouck, 2016). Additionally, AT services under IDEA (2004) require that school systems aid in the acquisition, training, and technical assistance for AT device use (Petcu et al., 2014). Teachers of students who use AAC devices should have access to training and technical assistance. Though most teachers take a technology class for their degree, the passive use of technology continues to be prevalent, hindering effective use of AT as well (USDOE, 2016).

Though the IEP requirement has been helpful to encourage active participation among students with AT needs, lack of proficiency continues to be problematic among population and teachers who must use it (Andzik et al., 2018). In one study by Andzik et al. (2018), about 44% of teachers reported having no training from an AAC specialist to utilize the technology with their students. This statistic indicated ongoing issues, especially since the teachers in the study worked with four students with CCN in their classes (Andzik et al., 2018). While AAC use has become more commonplace, effective use and implementation continue to plague current

practice. Students and teachers experience low self-efficacy using the devices due to low access, limiting the potential for mastery (Bouck, 2016). Though districts are responsible for ensuring device access and support under federal law, they continue to combat budgetary issues for appropriate training and device up-keep (Bouck, 2016; USDOE, 2017).

### **Teacher Self-Efficacy and Augmentative and Alternative Communication**

Utilizing AAC in the classroom is essential for students with CCN and their teachers. As previously mentioned, teachers are most frequent primary communication partners for students with CCN during the day. Teachers are expected to be confident using AAC devices as well as including them when planning instruction. Researchers have affirmed the importance of teachers' self-efficacy in effectively using AAC (DeCarlo et al., 2019; Hanline et al., 2018). Hanline et al. (2018) found that teachers reported increased ability to implement AAC into their classrooms post-professional development. It was also reported that multiple experiences and continued coaching led to the likelihood of AAC use in the classroom, with teachers' confidence rising as they continued to implement strategies (Hanline et al., 2018). Results from DeCarlo et al. (2019) resulted in comparable findings, with researchers stating that lack of engagement and lack of training for model communication partners (teachers) led to AAC device abandonment. Building positive self-efficacy in teachers, beginning with positive attitudes and willingness to learn, led to more consistent AAC usage.

The question of self-efficacy and AAC use was examined by other researchers, but findings were different (Ogirima et al., 2017; Tönsing & Dada, 2016). Ogirima et al. (2017) found that, though there was an initial increase in use post-training, continued AAC implementation faltered. Additionally, teachers had positive attitudes towards AT, but their competence in using it was quite low (Ogirima et al., 2017). Bandura's (1977) theory seems to

align with those findings. Self-efficacy was not just belief in something, but how beliefs affected an individual's behavior based on perceived outcome (Bandura, 1977). Though having a positive attitude toward AAC implementation is a great starting point for teachers, it does not necessarily imply that they feel confident in using the technology with their students (Ogirima et al., 2017). Tönsing and Dada's (2016) investigation revealed that teachers did not feel fully incompetent with the devices and there was need for robust training on using an AAC device effectively. Teachers recognized their responsibility in using AAC with their students and believed their role to be extensive in providing support to their students with CCN (Tönsing & Dada, 2016). However, training was often sporadic or limited in scope. Training also took place outside the classroom setting, meaning some of what was learned did not effectively transfer into the context of the classroom (Tönsing & Dada, 2016). These issues, which will be discussed further, contributed to teachers' low self-efficacy in using AAC effectively. Though researchers have addressed certain aspects of self-efficacy with AT, some seem to be missing. There must be consideration for all facets of self-efficacy when seeking to gain insight into teachers' decision-making process when using (or not using) AAC.

### **Using AAC: Barriers and Facilitators**

Teachers' decision to utilize AAC devices tends to be guided by ease of implementation rather than the utilization of evidence-based practices. The importance of communication in education being established, it is necessary to consider barriers and facilitators to AAC use for those with CCN. Aldabas (2019) investigated teachers' perspectives on what hinders or encourages the use of AAC with students with multiple disabilities. Using two questionnaires, he sought to identify barriers and facilitators of AAC use as reported by teachers. Results indicated that teachers believed training to be a primary facilitator of AAC use in the classroom, reporting

it to be beneficial in increasing frequency and effectiveness of use (Aldabas, 2019). These findings are in line with research done by Chazin et al. (2018), which determined that teacher training facilitated AAC use in the classroom. Though training was highlighted as an important factor to teachers' AAC use, access to training was identified as a continued issue in multiple studies (Aldabas, 2019; Andzik et al., 2019; Chazin et al., 2018). Andzik et al. (2019) found that less than 30% of teachers in their study had reported receiving training. Additionally, only some mentioned having access to a single training, not trainings offered over time or with continuing support (Andzik et al., 2019). The variance in training contributed to inconsistent use across educational settings for students who used AAC devices. Moorcroft et al. (2020) found that parents of students who AAC were increasingly frustrated with the lack of training. While some teachers had enough practice to work with large vocabulary banks on AAC devices, students experienced setbacks when switching schools due to grade level promotions or moving locations (Moorcroft et al., 2020). In new situations, teachers were still learning how to use AAC devices, causing divergent interactions with students (Moorcroft et al., 2020). Proper training is vital to both teacher and student success. As with most professional opportunities, the type of training determines the effectiveness of implementation.

### ***Professional Development***

Teacher training can facilitate AAC use, but not all professional development opportunities are created equal. Both Caron et al. (2016) and Chazin et al. (2018) determined that didactic trainings produced short-term results, with little effectiveness. The type of training can become a barrier to effective AAC implementation, since it may not accomplish what is intended. When researchers considered the training teachers had received, they found it was primarily focused on operational demands of AAC devices (Caron et al., 2016; DeCarlo et al.,

2019; Hanline et al, 2018). Operations were so heavily focused that some teachers reported issues with using strategies to implement AAC for communication in the classroom. The professional development was too specific and did not provide strategies that teachers could use across AAC modalities to encourage communication and participation of their students with CCN (Andzik et al., 2019). This issue continues to be problematic as students with CCN require coaching and opportunities for guided and independent communication. AT services specific to AAC use are provided under IDEA (2004) and include knowledgeable professionals with the ability to support students with selecting, acquiring, and using a device (Laughlin et al., 2018, p. 39).

When teachers receive appropriate AAC training, they have the ability and a higher probability of achieving instructional competence using the devices (Snodgrass & Meadan, 2020). Increased training improved classroom use and encouraged positive self-efficacy for teachers in the study conducted by Snodgrass and Meadan (2020). This finding was supported by previous research that established continued support and coaching to be helpful in increasing the frequency of device use. In trainings that focused on comprehensive use of AAC, teachers were able to learn and implement strategies to accommodate communication of students with CCN (Aldabas, 2019; Chazin et al, 2018; Hanline et al., 2018). As discussed in one study, “[T]he PD (professional development) must be tailored to meet the individual needs of the service providers so that it produces outcomes that are meaningful to the service providers” (Hanline et al., 2018, p. 243). Thus, providing access to training opportunities is key for successful use of AAC by teachers.

Andzik et al. (2019) found that training was a specific issue mentioned by teachers, including time needed to receive comprehensive instruction to use strategies effectively. Though



teachers believed that training was vital to improving student outcomes, few had received any training (Andzik et al., 2019). Only 29% reported receiving training from school-based speech and language pathologists (Andzik et al., 2019). Most training that was provided by individual schools and districts was limited and were short-term with minimal ongoing support. This, unfortunately, led to lack of device implementation as well as temporary use of effective strategies. Teachers struggled to seek training of their own due to limited availability and used online resources, such as Google and Pinterest, to engage in self-development (Andzik et al., 2019). Effective usage of AAC devices continue to be a challenge, especially since many teachers lacked preparation and support.

### ***Additional Barriers***

Other potential barriers identified by researchers included access to AAC devices and support from parents and administrators (Aldabas, 2019). Teachers reported minimal access to devices, making it difficult to learn and practice using them. Part of this issue is due to lack of funding to ensure that there is equitable access to necessary AT devices. Though Congress has enacted laws including federal fund support for educating children with disabilities, such as the Education for All Handicapped Children Act (1975) and IDEA (2004), special education continues to be underfunded (Blad, 2020). In fact, according to the National Council on Disability (NCD), the federal government, as of 2018, paid only 18% of the original promised amount toward educating children with disabilities (NCD, 2018). Of that, 15% of what is provided by the federal government under IDEA (2004) is required for early intervention services, meaning funding for students needing supports is further minimized (NCD, 2018). Inadequate funds continue to lead toward lower device access and less training opportunities for teachers.

While funding is a significant barrier, teachers also reported working in uncooperative school environments. Administrators were unwilling to implement changes that encouraged frequent use of AAC (Aldabas, 2019). Teachers also had to embrace their role as communication partners and facilitators to combat the negative effects of the environmental barriers that prevent AAC use (Aldabas, 2019). Lack of administrator support proved the process to be more difficult, as it affected the overall socioemotional environment of the school as a workplace and educational institution. Additionally, lack of family support made it more difficult for both teachers and students to use devices efficiently and with regularity (Aldabas, 2019). As DeCarlo et al. (2019) found, having students with families who recognized AAC as the voice for their children led to more consistent use across environments (home and school), leading to more habitual AAC use by teachers in the classroom. The ability to use AAC across environments helped students with CCN use their devices with greater regularity, which is the aim.

### **Attitudes Toward Students Who Use AAC**

For students with CCN using AAC, outside attitudes can affect how often they use their devices as well as the efficiency with which they use them. Research studies have demonstrated that teacher attitudes influence how students with disabilities are included in the classroom, especially those that require AAC accommodations (Radici et al., 2019). Peers of students with CCN are considered communication partners in addition to teachers, meaning their attitudes are necessary to consider when examining AAC use in the classroom. Since attitudes toward those using AAC devices can contribute to whether convergent or divergent strategies are employed in communication, it is necessary to explore them.

### *Teachers' Perceptions*

A school classroom is not only a place for learning but for social community for all students, including those with CCN. One of the issues faced by students who use AAC is how they and their devices are perceived. Communication accommodation theory (CAT) is grounded in perceived competence in those who engage in communication, both in speech and other forms (Giles et al., 1987; Giles & Ogay, 2007). Therefore, individuals with CCN need communication partners that perceive communicative confidence in them, believing in their ability to communicate using their AAC device or other means (Radici et al., 2020). A well-researched phenomenon, much focus has been placed on teachers' attitudes toward, and self-efficacy in, teaching students with special needs (Donne, 2016; Østvik et al., 2017; Radici et al., 2019). Research by Donne (2016) and Radici et al. (2019) showed multiple factors contributing to the ongoing issue of AAC use in the classroom. Experience was emphasized as a significant factor, with one study's results being so significant that researchers stated, "...experience alone may be enough to impact teachers' attitudes towards a child who uses AAC in class" (Radici et al., 2019, p. 293). Teachers with experience in using devices not only saw the benefit for improving communication for students with CCN, but also the reduction of problematic behaviors (Radici et al., 2019). This finding complemented previous studies that highlighted the importance of professional development for effective AAC implementation (Aldabas, 2019; Chazin et al., 2018). However, the element of how teachers' perceptions can affect their attitudes and views of student competency must be considered.

Up to this point, research focused on how perception and self-efficacy in teachers were connected, focusing on best practices for the inclusive classroom and teaching special education (Gee & Gonsier-Gerdin, 2018; Tönsing & Dada, 2016; Walton & Rusznyak, 2017). While this

area is vital, it is incomplete without consideration for teachers' perceptions of their students' abilities. When students do not communicate via speech or do so effectively due to CCN, perceptions of their competency were negative, with some even being prohibitive (Østvik et al., 2018; Radici et al., 2020). Additional training on working with students with CCN can help improve those perceptions. Other studies highlighted the importance of professional development to combat negative perceptions of students' abilities (Aldabas, 2019; Chazin et al., 2018). Continued training might assist in improving teachers' self-efficacy in working with students with CCN and AAC devices. It may also improve how teachers perceive students' ability to communicate.

### ***Teachers' Attitudes***

Teachers' attitudes can also determine how students with CCN are viewed in the classroom. In a study by Østvik et al. (2017), general education teachers were not invested in the students with CCN in their classrooms. Since some of the students were only in the general classroom for part of the day, teachers referred to them as "visitors," separate from their general education students. This led to a marginalization mindset, with the "visitors" term seeming to release teachers from the responsibility of becoming engaged communication partners and providing meaningful learning experiences (Østvik et al., 2017). The supposition that students needing AAC are incompetent was troubling, as students who needed AAC would not thrive in or learn in equitable settings (Woodfield & Ashby, 2015). However, with supports and efficient use of AAC by teachers, students with CCN could be active participants and learners (Woodfield & Ashby, 2015). Woodfield and Ashby (2015) discovered that teachers' positive attitudes were connected to meaningful learning experiences for students with CCN using AAC with both their

general and special education peers. Research by Radici et al. (2019) supported the notion, finding that having more experience could impact teachers' attitudes toward students with CCN.

A study by Saloviita (2020) delved deeper into teachers' attitudes toward inclusive education and serving students with disabilities. Results indicated that female teachers tended to be more positive toward inclusion than their male counterparts. Additionally, younger teachers were more likely to have positive attitudes toward inclusion of students with support needs than those over 30 years of age (Saloviita, 2020). Perhaps the most interesting finding by Saloviita (2020) was the importance of child-centeredness. Teachers who employed a more didactic approach for instruction were less likely to include students. Didactic methods encourage limited interaction and communication between teacher and student, which is troublesome for those who must build their communication skills for learning and social engagement (Banning, 2005). Willing of teachers work with students with CNN is vital to the development of the communication process for these students. They need convergent, willing partners to engage in more communication opportunities and support them along the way (Giles & Ogay, 2007).

### *Peers*

Students' attitudes toward peers who use AAC have been found to be impactful in the classroom. Though students tend to model behavior by their teachers, not all embrace the "visitor" mentality shared by Østvik, et al. (2017). To build social relationships with their peers, many students with disabilities are placed in inclusive classrooms to encourage the connection (Østvik et al., 2018). Research has found that students without CCN believed there to be many benefits in befriending a peer with CCN (Hyppa-Martin et al., 2016; Smucker et al., 2018). Children are inherently curious and, consequently, are eager to learn about those who seem different from themselves. The positive attitude and commentary reported by students towards

peers with CCN in a study by Smucker et al. (2018) reflected eagerness to engage with their peers. Furthermore, students exhibited positive attitudes when peers with CCN were using AAC they believed they could also use (Hyppa-Martin et al., 2016; Smucker et al., 2018). Though research has focused on adults as primary communication partners for students with CCN, peers play an important role in socialization and encouraging communication.

To support students in building relationships with their peers who use AAC devices, professional intervention may be required (Biggs et al., 2017). Though the purpose of AAC devices is to provide students with CCN more communication opportunities, social interactions with peers can be hindered by lack of competency and support from the general education teacher, special education teacher, and other school-based professionals (Biggs et al., 2017). Peers have been found willing to interact with students with CCN but are unsure how to initiate and maintain social conversations (Biggs et al., 2017; Dada et al., 2016; Østvik et al., 2018). This was especially true when students were participating in a large group or open-ended activities in a study by Østvik et al. (2018). To overcome these barriers, students with CCN must have frequent opportunities to engage with typical peers in small group settings and peer-mediated interventions to support communication (Light & McNaughton, 2015). Moreover, students with and without CCN must have similar core vocabularies, understanding and using words that have relevant usage in multiple environments (Brady et al., 2016). Though students with CCN learn language and communication in a different way, the words they use (or are encouraged to use) are like their peers. The elements required for social and academic relationships between peers are available. Using and combining those elements effectively must be done by teachers, specialists, and other professionals to facilitate communication and positive interactions.

## Summary

While teachers believe in the premise of inclusive education, some tend to dislike it in practice. One reason identified was teachers' self-efficacy in working with students who have disabilities, especially those that require AAC accommodations. Those who have not been trained in working with students with CCN struggle with implementing appropriate strategies and devising communication opportunities for their students. Moreover, the use of technology in the classroom is still a challenge for many teachers, and AAC devices are no different. With less than 50% of teachers reporting they have received AAC training, its use continues to be inconsistent in nature (Andzik et al., 2018). Though clear communication is correctly established as necessary for the learning process, comprehending and utilizing various forms of communication continues to be challenging. Literature stresses the role of teachers as communication partners as they spend significant time with students and provide multiple opportunities for engagement (Caron, et al., 2016; Kathard, et al., 2015). Unfortunately, many teachers express hesitancy in working with students with CCN, emphasizing lack of training, experience, and support as barriers to using AAC in their classrooms. Even so, research has shown that students who have been diagnosed with CCN build better communication skills when able to participate in the general education classroom (Erickson & Geist, 2016).

Though many students with CCN use AAC devices for communication and participation, there continues to be a gap in the literature focusing on teachers' self-efficacy with AAC devices. With much research regarding AAC use being qualitative in nature, there are limitations in generalizing findings due to small samples sizes and restricted contexts. Given that advocates for those with CCN and researchers have highlighted AAC devices as vital to accessing general curriculum, gauging how many teachers are familiar with CCN and their role in supporting

students needing additional communicative support, as well as their self-efficacy in utilizing AAC devices in their classrooms, is important. By examining self-efficacy with AAC technology and other variables, such as experience and training, school districts can gain a better understanding of teachers' confidence in working with students needing AACs devices. By examining a wider population, districts and administrators can review supports being provided for students with CCN and their teachers across settings and grade levels.



## **CHAPTER THREE: METHODS**

### **Overview**

The purpose of this quantitative, predictive, correlational study was to determine if teachers' self-efficacy could predict their intentions to use AAC in their classrooms and their perceptions of their students' ability to communicate effectively. A convenience sample from a southeastern Tennessee school district was collected. Chapter Three includes a description of the study's research design followed by the research questions and null hypotheses. Chapter Three also includes a description of the participants and setting and the study's instrumentation, procedures, and data analysis.

### **Design**

The researcher used a quantitative, predictive, correlational research design. Historically, most research examining augmentative and alternative communication (AAC) devices and those who use them has been qualitative (Aldabas, 2019; Baxter et al., 2012; Lund et al., 2017; Moorcroft et al., 2020; Østvik et al., 2017). Given the purpose of AAC devices and the small population that uses them, utilizing qualitative methods lends itself to exploring the who, how, and why questions that often accompany AAC device usage. However, quantifying the number of students with CCN who either need or use AAC devices has not been examined as closely.

### **Predictive Correlational Design**

The predictive correlational design was appropriate for this study as the researcher sought to determine the extent that an outcome (or criterion variable) could be predicted based on relational strength and direction with predictor variables (Gall et al., 2007). The following are operational definitions of this study's variables:

- Self-efficacy (predictor variable) – Self-efficacy is believing that a person can accomplish something successfully or the perception of one’s responsibilities and skills (Bandura, 1977). Soto (1997) defines teachers’ self-efficacy as teachers’ perception of their own skills and responsibilities.
- Intention to use AAC in the classroom (criterion variable) – Intention to use AAC in the classroom is defined as the likelihood that teachers will utilize AAC to meet the CCN of students in their classrooms. It is measured by Soto’s (1977) instrument and is based on administrative support, parental support, available time, and motivation.
- Perception of students’ abilities (criterion variable) – Perception of students’ abilities is defined as believing that all students can learn and can improve communication skills. This variable is also measured by Soto’s (1977) instrument.

For this study, teachers’ self-efficacy was the predictor variable and teachers’ intentions to use AAC in the classroom and their perceptions of students’ ability to communicate were the criterion variables. Andzik et al. (2018) sought to address AAC use in schools by conducting a large-scale study where teachers and students with CCN from all 50 states were represented. They found that students using AAC devices were still considered non-proficient communicators and training provided to teachers was extremely varied. This resulted in limited use of AAC with their students. Since previous studies have been qualitative in nature, quantitative analysis may provide a broader picture of teachers’ self-efficacy and using AAC devices. It is with this in mind that this author decided to conduct a quantitative study.

### **Research Questions**

**RQ1:** How accurately does teachers' self-efficacy predict teachers' intentions to use AAC in the classroom?

**RQ2:** How accurately does teachers' self-efficacy predict their perception of students' ability to communicate effectively?

### **Hypotheses**

**H<sub>0</sub>1:** There is no significant predictive relationship between the criterion variable (intentions to use AAC in the classroom) as measured by the Intention to Use AAC in the Classroom subscale of the TASTA and the predictor variable (teachers' self-efficacy) as measured by the Perception of Own Skills and Responsibilities subscale of the TASTA.

**H<sub>0</sub>2:** There is no significant predictive relationship between the criterion variable (perception of students' communication ability) as measured by the Perceptions of Students' Abilities subscale and the predictor variable (teachers' self-efficacy) as measured by the Perception of Own Skills and Responsibilities subscale of the TASTA.

### **Participants and Setting**

The participants for this study were special education and general education teachers based in a larger school district that serves a somewhat diverse student population, including students who need the support and use of an AAC device for communication. The following sections includes a description of the population, participants, and setting.

#### **Population**

The school district from which participants were selected includes both urban and suburban areas with approximately 46,000 students (Institute of Education Sciences [IES],

2019). According to district data, the school system serves over 8,100 students with disabilities, some of whom use assistive technology to access their educational environment and learning (Mangrum, 2018). Students receive services through the implementation of individualized education plans in both inclusive and specialized school settings (such as a self-contained classroom focused on communication) (IDEA, 2004). The district employed 2,870 classroom teachers, with approximately 63% of those working in elementary grades, kindergarten through fifth grade. Data from the district shows that the racial demographics of educators differs from the students they serve. Thirty percent of the student population were African American while 8% of teachers also identified as such (WTVC, 2018). The majority of students (54%) and teachers (85%) were White (WTVC, 2018). Out of the 70 schools in the district, 13 school administrators gave permission to contact their teachers. The varied responses represented urban, rural, and suburban schools in the southeastern Tennessee school district.

### **Participants**

The participants for this study were drawn from a convenience sample of kindergarten through eighth grade teachers from a southeastern Tennessee school district. Teachers working with this age group were chosen due to communication development that students undergo during this time, especially in earlier grades (Light et al., 2019). The early years, ages zero to five, are vital in language development, with children learning first words, the meanings of those words, and making sense of the world around them with increasing and cultivated vocabulary (Light et al., 2019). Kindergarten through fifth grade teachers help their students learn language concepts, such as the different contexts where language is used and how language is used.

As children get older, sixth grade through eighth grade teachers continue to help them understand complex application of language concepts, utilizing the more unique aspects of

communication in learning. Given the unusual language development that often takes place for students with CCN, it would be beneficial to glean how teachers approach learning and interactions for them. Similarly, young students' interactions with their peers gain greater import as social relationships are an essential part of becoming part of a community and quality of life (Therrien & Light, 2018). Students with CCN are at greater risk of isolation due to their communication challenges, often needing an adult communication partner to step in and help facilitate positive interactions. It was important to examine how kindergarten through eighth grade teachers viewed their role as communication facilitators and whether they believed themselves to be confident in providing the necessary support for students with CCN to be successful in their classrooms.

Prior to conducting the study, a research application request was completed and submitted to the head of assessment and research for the school district. Though this process is usually designated for research that requires obtaining student data or student participants, it is also used to enlist district assistance with distributing research information and survey links for studies that seek participation from district employees (e.g., sending an email to all elementary teachers using the mass email option for employees of the district). Once approval was granted from the school district, the description of the study and participation information were disseminated electronically to all elementary and middle school teachers in the district via email.

For this study, there were 100 participants. According to Gall et al. (2007), 66 teachers is the minimum amount required when assuming a medium effect size with statistical power of .7 at the .05 alpha level. The sample was obtained from multiple elementary and middle schools across the district to procure an inclusive depiction of results representing more than one geographical area within the district. By soliciting participation from all kindergarten through

eighth grade teachers in the district, there was increased likelihood of obtaining feedback from teachers that serve in suburban schools and urban schools.

To participate in the study, teachers must have taught or had taught students who received speech services either in a private, therapeutic setting or as part of their required service in IEPs. This requirement was addressed in the first item of the survey instrument to ensure that the participants were eligible for this survey. The researcher collected demographic data such as years of experience, gender, education level, exposure to AAC training, and whether participants had experience in using any form of AAC (such as photos, devices, picture exchange cards [PECs], typing, or sign language) and analyzed data using frequency tables. Information regarding whether a teacher specialized in general or exceptional education was collected. This assisted the researcher in understanding teachers' experience in the classroom as well as their experience with AAC, in any form. The sample included 62 male educators and 38 female educators. The sample also included 11 teachers with less than two years of experience, 47 teachers with two to five years of experience, 31 teachers with five to 10 years of experiences, and 11 teachers with more than 10 years of teaching experience.

### **Setting**

The setting for this study included schools that service elementary school and middle school students in a large southeastern school district in Tennessee. Though the choice to use this site was mainly due to convenience of location, the district also represented rural, suburban, and urban communities, addressing the need for data from diverse schools. All schools in the district enrolled students who received services from the district's exceptional education department. There were 73 schools in the district that provided educational services for kindergarten through eighth grade students, with one designated to specifically serve students with special needs or are

at high risk due to emotional or behavioral problems.

### **Instrumentation**

The Teacher Attitudinal Scale toward AAC (TASTA) was used to measure teachers' perceptions of their skillset and responsibilities (self-efficacy), perceptions of students' ability to communicate, and teachers' intention of using AAC in their classrooms. Soto (1997) used the instrument to determine the beliefs and attitudes of educators regarding AAC use, especially those who supported students with CCN that require use of AAC devices. Though initially created with special education teachers in mind, TASTA was used and adapted for studies that included regular education teachers and measured their attitudes regarding AAC devices and the students who used them (Bornman & Donohue, 2013; Dada, 1999; Radici et al., 2019). These studies focused on different aspects of the area of AAC and teacher research. Dada (1999) focused on teachers' attitudes towards students with CCN using different AAC devices while Bornman and Donohue (2013) focused on teachers' attitudes towards students with attention-deficit and hyperactivity disorder with minimal speech. Radici et al. (2019) investigate teachers' attitudes towards students who used AAC. All three studies focused on teachers' attitudes toward students but did not investigate on the role that self-efficacy played in the determinations. Additionally, the number of studies that have used the tool in its original form were difficult to find outside of its initial creation, though it meets reliability criteria. For this study, the TASTA was adapted to an online survey format and participants typed and clicked their responses. The TASTA measures teachers' beliefs regarding the use of AAC by students with CCN and includes the following five factors: perceptions of students' abilities, teachers' self-efficacy, perceptions of speech language pathologists' responsibilities, teachers' attitude toward communication training, and intention to use AAC in the classroom (Soto, 1997). Perceptions of

students' abilities is the belief that all students can learn and improve communication skills (Soto, 1997). Teachers' self-efficacy focuses on teachers' perception of their own skills and responsibilities (Soto, 1997). The third factor, perceptions of speech language pathologists' responsibilities, is dedicated to what speech-language clinicians should be doing to support students with CCN in using AAC devices (Soto, 1997). Teachers' attitude toward communication training is another factor that has items to determine the willingness of teachers to engage in additional training to learn communication skills and strategies to support students with CCN (Soto, 1997). The final factor includes items to determine teachers' intention to use AAC in the classroom (Soto, 1997).

While the TASTA was given in its entirety, only the following subscales were used to measure variables of the same name: perceptions of students' abilities, teachers' self-efficacy, and intention to use AAC in the classroom.

Validity of the questionnaire items to ensure they measured the factors as intended was ascertained via member check of the focus group participants who provided the overall themes from which to create the survey. To create the TASTA, Soto (1997) reviewed pertinent literature along with utilizing qualitative and quantitative research methods. The first step was conducting focus groups with experts in AAC to determine what they believed to be important in teachers' skillset to help students needing AAC. The draft of the survey was then provided to the focus group members for feedback and analysis.

The instrument included a five-point Likert scale that ranged from Strongly Agree = 5, Agree = 4, Undecided = 3, Disagree = 2, and Strongly Disagree = 1. A factor analysis was conducted with five factors emerging using a Varimax procedure, which tests for variance for underlying factors (Soto, 1997). As shown in Table 1, internal consistency reliability was



measured using Cronbach's alpha with subscale values ranging from 0.87 to 0.69 coefficients, which is within the acceptable statistical range, depending on the number of items in each of the different factors (Soto, 1997; Warner, 2013).

**Table 1**

*Cronbach's Alpha Reliability Coefficients for Each Factor*

Factor	Number of Items	$\alpha$ -Value
Perceptions of students' abilities	5	.84
Perception of own skills	6	.74
Perceptions of SLP's responsibilities	3	.69
Attitude toward communication training	3	.77
Intentions to use AAC	13	.87

*Note.* These results are based on Soto's (1997) research to develop the TASTA.

<sup>a</sup> n = 187 for each factor.

Scoring for each factor was based on the positive and negative directionality of survey items in each one, which can be found in Soto's (1997) work. The combined possible range of the score on the TASTA was from 30 to 150 points. A score of 30 points represented the lowest possible score, which meant that respondents exhibited low self-efficacy in using AAC with students, a negative attitude toward the students need AAC, and using AAC in the classroom. A score of 150 points was the highest possible score, meaning that participants exhibited positive self-efficacy in using AAC devices and strongly believed in students' ability to communicate effectively. The researcher used the Statistical Package for the Social Sciences (SPSS) to record and score data results as well as facilitate statistical analyses. Because there were 30 items in the instrument, participants took 15 minutes or less to complete the survey (Hopper, 2017).

Permission was granted by the instrument's creator, Dr. Gloria Soto, and can be found in Appendix A. The items used in the TASTA will be included in Appendix B.

### **Procedures**

Prior to beginning the research process, an Institutional Review Board (IRB) application packet was completed and submitted to Liberty University for approval. The IRB approval letter can be found in Appendix C. After obtaining IRB approval, the researcher contacted the director of assessment and research for the school district via email and phone call to request permission to conduct research by way of requesting teacher participation via their district email addresses. The official application form for conducting research in the school district was sent as an email attachment, with the accompanying email explaining the request to the director of research, which will be found in Appendix D. Once approval was obtained, participation from elementary and middle school teachers was solicited via their district email addresses. The initial email correspondence included a consent letter that fully explained the study to potential participants (see Appendix E). The consent form was included in email correspondence with a link to the electronic consent form created using the Qualtrics platform. The consent form included the study information in the email and the option to click yes or no to participate. It was reiterated to potential participants that they must complete the consent form to participate in the study.

The second email included a link to the survey, highlighted to ensure it is easily visible to recipients, and instructions for completing the survey. The correspondence included a note to participants that those who fill out the survey in the first two weeks would be entered into a drawing for one of three \$50 Amazon gift cards to encourage timely participation. After one week of the survey being made available, another email was sent with the Qualtrics survey link, with a reminder to teachers about study participation and the Amazon gift card drawing. A final

email was sent the following week to request completion of the survey by those who have yet to participate. If teachers already participated and clicked the survey link, they were taken to a webpage that informed them of their prior participation and thanking them for it. By utilizing these follow-up procedures, the researcher was able to meet the minimum criteria of 100 participants for the study (Gall et al., 2007). After the final week was complete, the researcher completed the drawings for the Amazon gift cards using a random number generator on the website, Calculator.net, to choose the winners. Using the emails provided during survey completion, participants were contacted if they won one of the gift cards. Survey results were recorded using the statistical software program, *SPSS*.

### **TASTA Survey**

The items from TASTA were adapted to an online survey format using the Qualtrics (2020) platform. In addition to the TASTA items, demographic questions were included in the final survey version. To create an online survey using Qualtrics (2020), a university account was requested from Liberty University's Qualtrics Support in Analytics and Decision Support via email. Next, a request was sent via email to Dr. Steven McDonald who served as the Qualtrics Division Administrator for the School of Education. Once the account was approved and created, there was the option to create a new project and create the survey using demographic questions and TASTA items. There were multiple question types provided in Qualtrics. For the purposes of the TASTA, three types of questions were used: multiple choice, text entry (for entering email addresses), and the matrix table option to create the Likert scale survey items. There were options for both the multiple choice and matrix table for single answer and multiple answer responses. All these items were created as single answer responses, except for the demographic question regarding race.

Each section of TASTA was aggregated into blocks of items for participants to respond, with the shortest block comprising one item and the longest block having 13 items. The first block determined whether the participant qualified for the survey and asked whether the teacher worked with students who receive speech and language services, either privately and/or as part of individualized education plans. If participants selected “no,” they were taken to the end of the survey. Those who selected “yes” were automatically progressed to the next block which required an email address and demographic information. Email addresses were only used for the gift card drawing. The following five blocks were the TASTA items that utilized a Likert scale, from Strongly Agree (5) to Strongly Disagree (1), which can be viewed in Appendix C. The survey was able to be taken on both desktop and mobile devices. To progress through each section, participants were provided with a “next” navigation button. If a response had not been entered for one of the items, the participant was not allowed to progress until the item received a response. This helped prevent a high number of missing values in the data set and reduced the number of surveys needing to be excluded. This was also in line with the administration of the original TASTA instrument (Soto, 1997).

### **Data Analysis**

A bivariate linear regression analysis was used to evaluate the two null hypotheses to determine if significant predictive relationships existed between the following sets of variables: intentions to use AAC in the classroom and teachers’ self-efficacy; and, perception of students’ communication ability and teachers’ self-efficacy, as measured by TASTA. The researcher entered the data into *SPSS* and screened for missing scores or scores outside the expected range (Creswell & Guetterman, 2019). Incomplete surveys were omitted. Using *SPSS*, descriptive statistics were analyzed to clearly understand the population. Descriptive statistics of mean and

standard deviation were reported on the following variables: teachers' self-efficacy, perceptions of students' abilities, and intentions to use AAC in the classroom as measured by the TASTA subscales of the same names. Scatter plots were used to assess for assumptions of data linearity, normal distribution, and bivariate outliers (Gall et al., 2007).

### **Bivariate Linear Regression**

The statistical analysis utilized was the bivariate linear regression. The bivariate regression analysis was consistent with both research questions as the researcher sought to determine whether predictive relationships were evident between the teachers' self-efficacy (predictor variable) and the criterion variables, intentions to use AAC in the classroom and of students' ability to communicate effectively. Warner (2013) stated, "A bivariate regression analysis provides an equation that predicts raw scores on a quantitative *Y* variable from raw scores on an *X* variable" (p. 344). As the predictor and criterion variables were both continuous and measured on interval variables, bivariate linear regression was appropriate for this study. The analysis allows the description of the strength of the relationship between two variables using mathematical terms (Gall et al., 2007).

The researcher completed preliminary screening of the data by examining scatter plots (Warner, 2013). The three assumptions to be met were assumption of bivariate outliers, assumption of linearity, and assumption of bivariate normal distribution. To analyze the assumption of bivariate outliers, the scatter plot between the predictor variable (*x*) and each criterion variable (*y*) was examined for outliers that were outside most data points (Warner, 2013). The assumption of linearity was examined to assess whether the predictor variable (*x*) and criterion variables (*y*) relationship was linear (Warner, 2013). The assumption of bivariate normal distribution was met if the scatter plot between the predictor variable (*x*) and the criterion

variables ( $y$ ) had the classic “cigar shape” (Warner, 2013). The effect size was reported as Pearson’s  $r$  (Warner, 2013).

## CHAPTER FOUR: FINDINGS

### Overview

Chapter Four includes all data analysis for this study including review of the posed research questions and null hypotheses. The researcher reports the statistical procedure used for the hypothesis, data screening, and assumption testing for the study. Results include descriptive statistics, assumption testing, statistical testing, and bivariate linear regression results.

### Research Questions

The following research questions guided this quantitative study:

**RQ1:** How accurately does teachers' self-efficacy predict teachers' intentions to use AAC in the classroom?

**RQ2:** How accurately does teachers' self-efficacy predict their perception of students' ability to communicate effectively?

### Hypotheses

The null hypotheses for this study were:

**H<sub>01</sub>:** There is no significant predictive relationship between the criterion variable (intentions to use AAC in the classroom) as measured by the Intention to Use AAC in the Classroom subscale of the TASTA and the predictor variable (teachers' self-efficacy) as measured by the Perception of Own Skills and Responsibilities subscale of the TASTA.

**H<sub>02</sub>:** There is no significant predictive relationship between the criterion variable (perception of students' communication ability) as measured by the Perceptions of Students' Abilities subscale and the predictor variable (teachers' self-efficacy) as measured by the Perception of Own Skills and Responsibilities subscale of the TASTA.

## Descriptive Statistics

The sample includes both elementary and middle school teachers. Of the sample population, 38% were female and 62% were male. Eighty-four percent of the sample population identified as White, 7% of the sample population identified as Black or African American, and the remaining 9% included American Indian or Alaska Native, Native Hawaiian or Pacific Islander, Hispanic or Latino, and mixed races/ ethnicities. Due to incomplete responses, two participants' data were excluded, resulting in  $N = 100$ . There were 77 general education teachers, representing 77% of participants, and 23 special or exceptional education teachers, representing 23% of participants.

## Results

### Null Hypotheses

The means and standard deviations for the predictor variable (self-efficacy) and criterion variables (perceptions of students' abilities and intention to use AAC in the classroom) for **H<sub>01</sub>** and **H<sub>02</sub>** are listed in Table 2: Descriptive Statistics for Regression Variables.

**Table 2**

*Descriptive Statistics for Regression Variables*

Variable	<i>N</i>	Mean	<i>SD</i>
Self-efficacy: Perception of own skills	100	22.90	3.15
Perceptions of student's abilities	100	16.56	2.91
Intentions to use AAC	100	44.00	4.58



## **Data Screening**

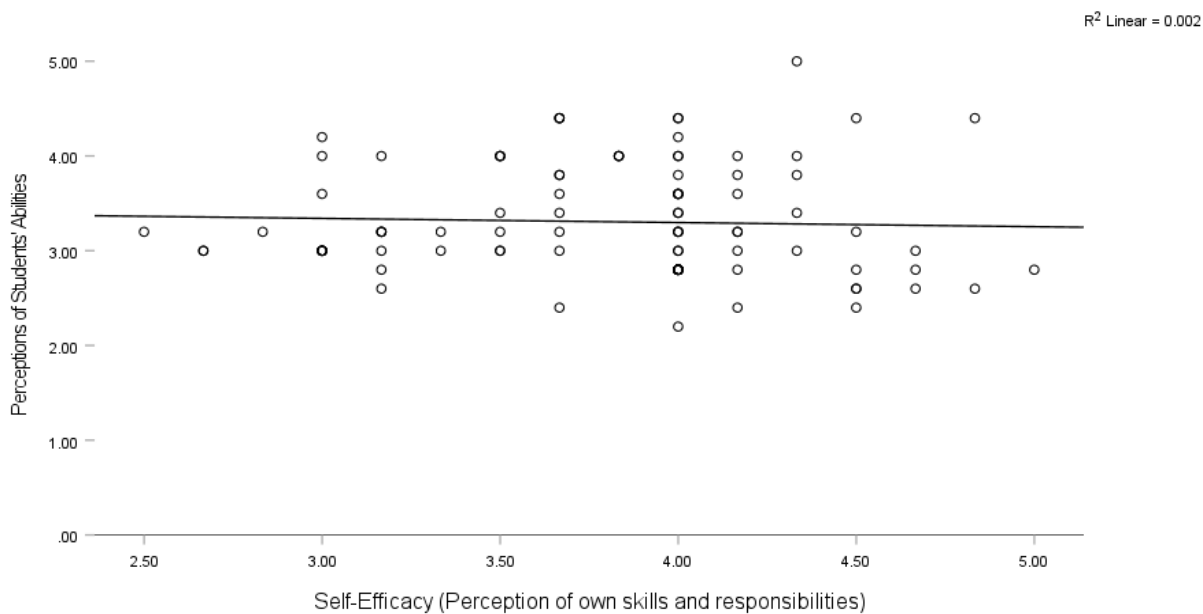
Data screening was conducted on all variables. The researcher examined the data set for missing data points and inconsistencies. No data errors or inconsistencies were identified; therefore, no data were excluded.

## **Assumption Testing**

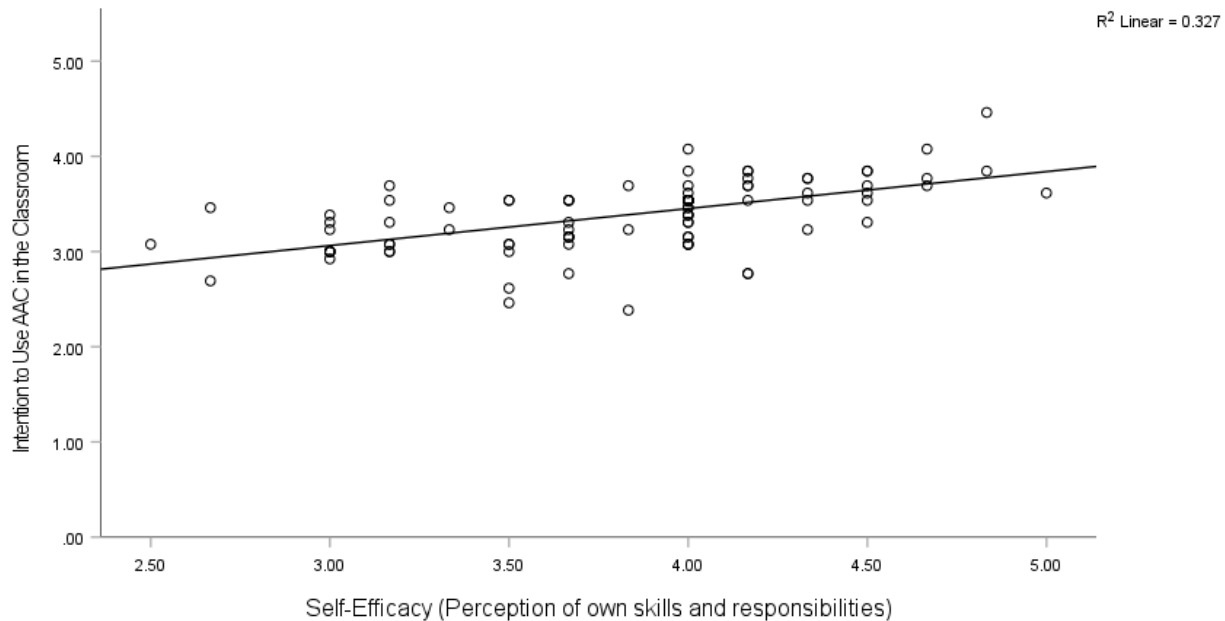
The researcher created two scatterplots: perceptions of students' abilities against self-efficacy (Figure 1) and intention to use AAC in the classroom against self-efficacy (Figure 2). Visual inspection of both scatterplots indicated a linear relationship between the variables. Data were reviewed for extreme outliers using boxplots (Figures 3 and 4). There were no extreme outliers and the data set was complete. Scatterplots were utilized to analyze the assumption of bivariate outliers, assumption of linearity, and the assumption of bivariate normal distribution. The assumption of bivariate outliers and linearity were tenable. The bivariate normal distribution assumption was also found to be tenable as illustrated by the cigar shape in both Figures 1 and 2. There was homoscedasticity on the basis of a visual inspection of plots of standardized residuals versus standardized predicted values (Appendix G).

**Figure 1**

Scatterplot of Perceptions of Student's Abilities and Self-Efficacy

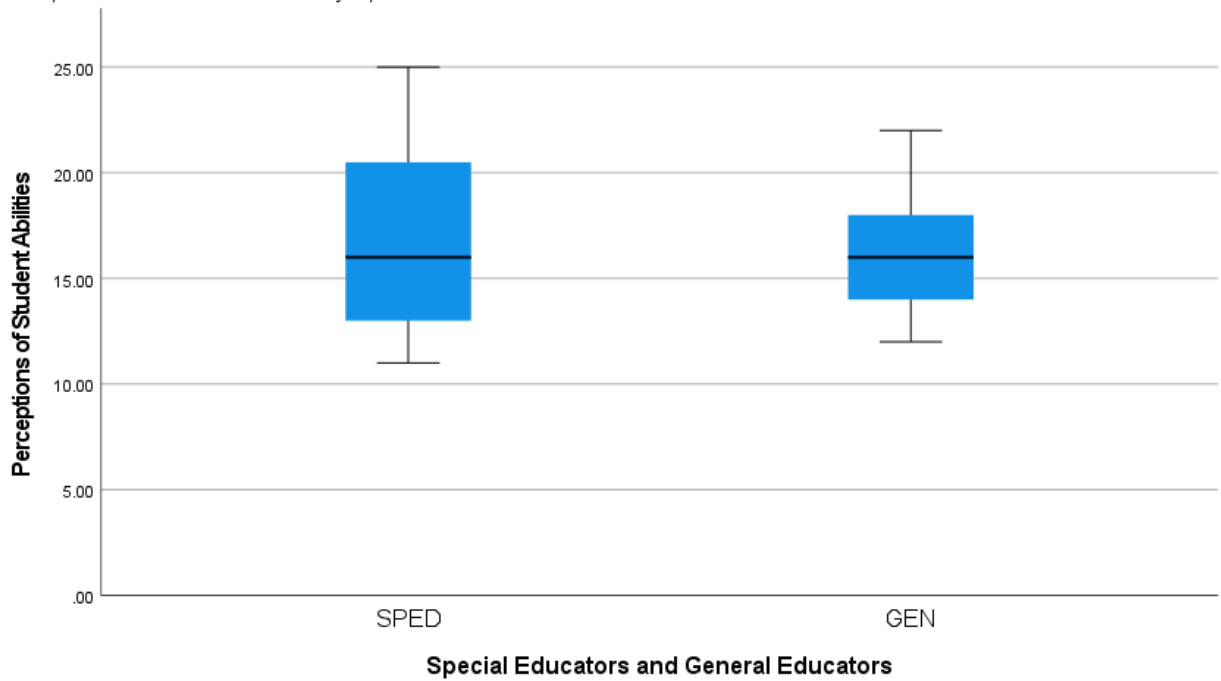
**Figure 2**

Scatterplot of Intentions to Use AAC in the Classroom and Self-Efficacy



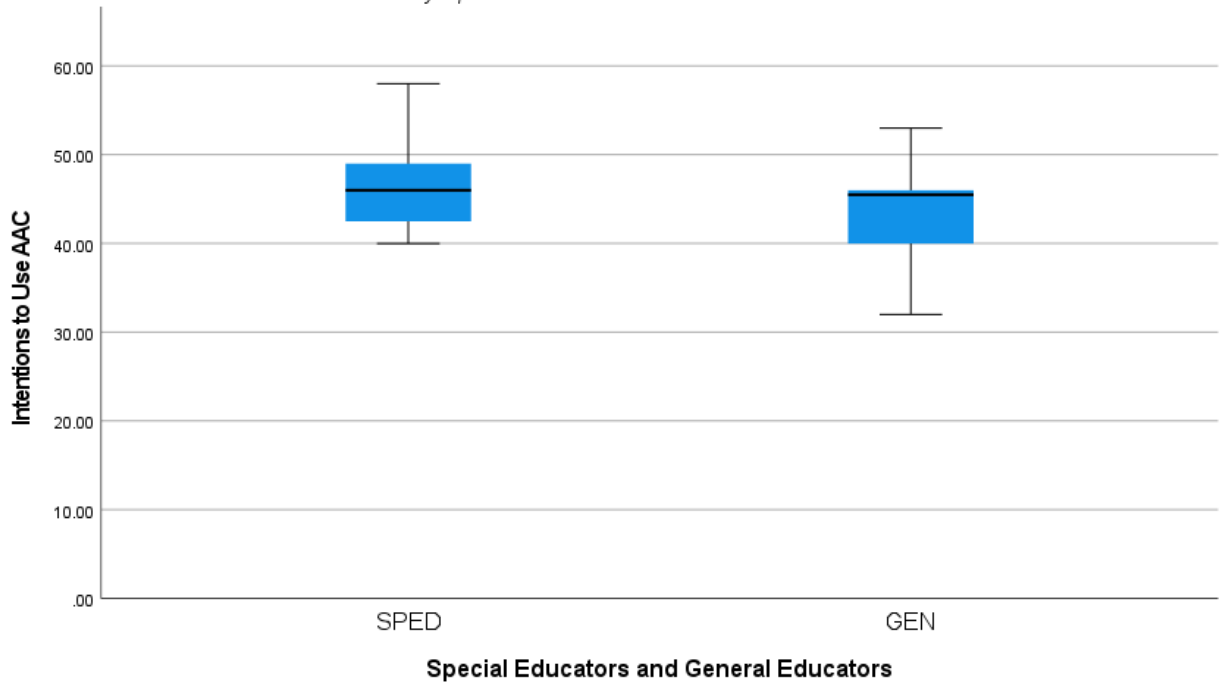
**Figure 3**

*Perceptions of Student Abilities by Special and General Educators*



**Figure 4**

*Intentions to Use AAC in the Classroom by Special and General Educators*



### *Null Hypothesis One*

The first null hypothesis stated that there is no significant predictive relationship between intentions to use AAC in the classroom as measured by the Intention to Use AAC in the Classroom subscale of the TASTA and teachers' self-efficacy as measured by the Perception of Own Skills and Responsibilities subscale of the TASTA. A bivariate linear regression was conducted to determine whether self-efficacy predicted teachers' intentions to use AAC in the classroom. Teachers' self-efficacy accounted for 33.5% of the variation in intentions to use AAC in the classroom with adjusted  $R^2 = 32.8\%$ , a medium effect size (Warner, 2013). Results indicated that teachers' self-efficacy ( $M = 22.90$ ,  $SD = 3.15$ ) statistically significantly predicted intentions to use AAC in the classroom ( $M = 44.00$ ,  $SD = 4.58$ ),  $F(1, 99) = 49.26$ ,  $p < .001$ , thereby rejecting the null hypothesis (see Table 3).

**Table 3**

*ANOVA<sup>a</sup>*

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	678.37	1	678.37	49.26	<.001 <sup>b</sup>
Residual	1349.60	99	13.771		
Total	2027.96	100			

<sup>a</sup> Dependent Variable: Intentions to use AAC in the classroom

<sup>b</sup> Predictors: (Constant), Teachers' self-efficacy

The regression equation for predicting intentions to use AAC in the classroom is  $y = 24.70 + .84x$ , where  $y$  represent intentions to use AAC in the classroom and  $x$  represents teachers' self-efficacy. The 95% confidence intervals for slope between .60 and 1.1 (see Table 4).

**Table 4***Coefficients<sup>a</sup>*

Model	<i>B</i>	<i>SE B</i>	$\beta$
1 (Constant)	24.70	2.78	
Teachers' self- efficacy	.84	.12	.578

*Note.* <sup>a</sup> Dependent Variable: Intentions to use AAC in the classroom

***Null Hypothesis Two***

The second null hypothesis stated that there was no significant predictive relationship between perception of students' communication ability as measured by the Perceptions of Students' Abilities subscale and teachers' self-efficacy as measured by the Perception of Own Skills and Responsibilities subscale of the TASTA. A bivariate linear regression was conducted to determine whether teachers' self-efficacy predicted their perceptions of students' communication abilities. Results indicated that teachers' self-efficacy accounted for less than 1% of the variation in perceptions of students' communication abilities with adjusted  $R^2 = -1\%$ , indicating a very small effect size. Results indicated that there was no significant predictive relationship between teachers' self-efficacy ( $M = 22.90$ ,  $SD = 3.15$ ) and perceptions of students' ability to communicate ( $M = 16.56$ ,  $SD = 2.91$ ),  $F(1, 99) = .174$ ,  $p = .677$ , thereby failing to reject the second null hypothesis (see Table 5).

**Table 5***ANOVA<sup>a</sup>*

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.49	1	1.49	.17	.677 <sup>b</sup>
Residual	845.46	99	8.54		

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Total	846.95	100
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<sup>a</sup> Dependent Variable: Perceptions of students' ability to communicate

<sup>b</sup> Predictors: (Constant), Teachers' self-efficacy

## CHAPTER FIVE: CONCLUSIONS

The purpose of this study was to determine whether teachers' self-efficacy could predict their intentions to use AAC in their classrooms as well as their perceptions of students' abilities to communicate effectively as measured by subscales of the TASTA. The researcher investigated teachers' self-efficacy as a predictor variable. In Chapter Five, the results for each null hypothesis are discussed in the context of the literature and the theoretical framework. Chapter Five also includes the conclusions of the study, limitations, and recommendations for future research.

### Discussion

As the number of students with CCN increases, the use of AT for communication continues to rise in IEPs. Interest in equitable access in the general education classroom for students with communicative difficulties has intensified (Every Student Succeeds Act, 2015; IDEA, 2004). This requires both special education teachers and general education teachers to expand their skillset to ensure students receive necessary supports (Koh & Shin, 2017).

Focus on students with CCN having access to appropriate services has been mentioned in previous research (Andzik et al., 2018; Bouck, 2016). The issue of teachers' self-efficacy and AAC use in the classroom has been qualitatively studied in research multiple times, but rarely investigated in quantitative research (Caron et al., 2016; Kanjere, 2017). Previous research found self-efficacy influenced teaching practices (Østvik et al., 2017; Woodfield & Ashby, 2015). In the current study, self-efficacy was the predictive variable to determine whether it would impact teachers' intentions to use AAC in the classroom, as well as their perceptions of students' ability to communicate. This study's results seem to support what previous qualitative research studies have noted—self-efficacy can impact teacher intentions in their classrooms.

### **Null Hypothesis One**

A bivariate linear regression was calculated to determine whether there was a predictive relationship between teachers' self-efficacy as the predictor variable ( $M = 22.90$ ,  $SD = 3.15$ ) and the criterion variable of intentions to use AAC in the classroom ( $M = 44.00$ ,  $SD = 4.58$ ). The results showed that teachers' self-efficacy did significantly predict teachers' intentions to use AAC in their classrooms,  $F(1, 99) = 49.26$ ,  $p < .001$ . Thus, **H<sub>01</sub>** was rejected.

These results support previous findings that teachers' self-efficacy can significantly impact their instructional decisions. Considering the theory of self-efficacy, it appears the importance of intrinsic motivation and tools for mastery are necessary for teachers to be comfortable with using AAC in the classroom (Hayden, 2019; Koh, 2018). Bandura (1986) found that self-perception is created by individuals based on the judgements of their behaviors and reactions. It is one of the main elements that affect how teachers respond to their students as well as their needs. Self-efficacy in this case can also be connected to how Communication Accommodation Theory (CAT) can be manifested in the classroom between teacher and child. When explaining CAT, Giles et al. (1987) encouraged minimizing communicative differences between communication partners. The differences must be noted and limited by communication partners, especially by the stronger communicator. In this case, the teacher would need to be comfortable in meeting the student with CCN where they are for meaningful communication to take place (Simmons-Mackie, 2018). If communication involves additional steps or devices with which teachers are unfamiliar, effective communication can be tenuous. Ruppert et al. (2016) found that both general and special educators were open to participate in recommended practices, including the use of assistive technology like AAC for those with CCN. By increasing awareness



of the factors that affect AAC use in the classroom, teachers can be better served to meet students' communication needs.

### **Null Hypothesis Two**

A bivariate linear regression was conducted to determine whether there was a relationship between teachers' self-efficacy as the predictor variable ( $M = 22.90$ ,  $SD = 3.15$ ) and perceptions of H02 students' communication ability as the criterion variable ( $M = 16.56$ ,  $SD = 2.91$ ). Results indicated that there was no statistically significant predictive relationship between teachers' self-efficacy and teachers' perceptions of students' communication ability ( $F(1, 99) = .174$ ,  $p = .677$ ). As such, the hypothesis was not rejected.

These results align with previous research regarding teachers' perceptions of working with students with disabilities in inclusive classrooms (Arrah & Swain, 2014; Woodcock & Wolfson, 2019). Positive teacher perceptions of working with students is well-recorded in previous educational research, especially when considering the idea from a theoretical perspective (Bentley-Williams et al., 2017; Dapudong, 2014; Woodcock & Wolfson, 2019). The idea that students can communicate effectively appears to be separate from how teachers view their own skillset in meeting student needs (Atanga et al., 2020).

There has been little research in how positive perceptions relates to teachers' self-efficacy in meeting communication needs. Meeting needs usually begins with the theoretical idea, then moves notable action in pedagogical approaches. This study suggests that teachers' self-efficacy does not predict how teachers perceive their students. Erickson and Geist (2016) believed that teachers must be proactive about finding access points for communication for students with CCN. While the idea of convergent communication is accepted in CAT and by many teachers, divergent communication methods continue to be used regularly, highlighting communication

differences between teacher and student (Brady et al., 2016; DCDSS, 2018; Giles & Ogay, 2007). While this study did not find a predictive relationship between teachers' self-efficacy and their perceptions of students' ability to communicate, the practice of effective communication cannot be understated. Caron et al. (2016) found that teachers required ongoing support to ensure proper use of AAC devices with students. Having a positive mindset may encourage teachers to use appropriate strategies to meet the communication needs of their students.

### **Implications**

Understanding how teachers' self-efficacy can affect their teaching practices is vital to working with students with CCN. Teachers serve as primary communication partners as well as models for effective use of AAC devices for students with CCN (Caron et al., 2016; Giles & Ogay, 2007; Kathard et al., 2015). With more children receiving diagnoses for communication disorders, the importance of determining what can impact teachers' use of AAC devices is crucial to meeting the communication needs set forth in an IEP (Brady et al., 2016; DeCarlo et al., 2019; Hanline et al., 2018). The results of this study added to the body of research by reinforcing the previous findings regarding the impact of teachers' self-efficacy in working with students with CCN. The results also added to the body of research by recognizing that teachers' self-efficacy impacted their practices without negatively impacting the perception of students' abilities to communicate.

The relationship between self-efficacy and AAC use in the classroom is reinforced by previous research that identifies the lack of training and resources that educators need to use devices successfully (Aldabas, 2019; Andzik et al., 2019; Chazin et al., 2018). The lack of confidence, knowledge, and practice often prevents teachers from using AAC devices effectively. However, as this study and previous studies found, with appropriate training and

practice, educators have greater potential to use AAC devices with increased instructional competence (Snodgrass & Meadan, 2020). While the findings indicated the predictive relationship between self-efficacy and AAC use in the classroom, the lack of widespread, quantitative research on the topic is noticeable (DeCarlo et al., 2019; Hanline et al., 2018; Kathard et al., 2015). Students with CCN require increased support to participate in academic and social discourse. Ensuring educators are prepared to fulfill their duties as communication partners is an important issue for school districts to consider. However, additional research needs to investigate the prevalence of the issue in the broader population rather than a small sample of educators from one school district.

Results indicated that teachers' self-efficacy did not predict their perceptions of students' abilities. This is reinforced in previous research where teachers were willing to work in inclusive settings, believing in student potential though not necessarily their own (Dapudong, 2014). There is a willingness to meet students' needs and believe in their potential for success, but the lack of knowledge and support continue to serve as barriers to effective implementation of inclusive practices and strategies (Dapudong, 2014; Kurniawati et al., 2017; Mequita-Hoyos et al., 2018; Mngo & Mngo, 2018). Though the current research has reinforced these findings, future research is needed to determine whether increased access to AAC devices and use with students would impact perceptions of communicative abilities. Reviewing how resources can be utilized would be beneficial to determine if there is an improvement in teachers' views of their own abilities.

### **Limitations**

This study has several limitations. First, less than 20% of administrators responded to the requests to reach out to their teaching staff. Second, there were only 100 responses that fit the criteria for participation. That represented only 3.5% of the total number of teachers employed in

the county. Given the size and convenience of the sample, the findings of this study cannot be generalized beyond the population in this study. Third, the demographics of the participants were not diverse. Sixty-two percent of teachers were male and 84% identified as White, which limited the ability to generalize to more other populations. Fourth, the predictive, correlational design of the study has limitations when considering the interpretation of results. Correlational designs focus on the identification of a relationship between variables but cannot determine causation. As discussed in Gall et al. (2007), a correlational study cannot assume a cause-and-effect relationship. It can only show the strength and direction of a relationship between variables. Lastly, the responses to the survey are all self-reported and assume that respondents fully understood the survey items and answered honestly.

### **Recommendations for Future Research**

1. Future research should include multiple school systems within a small geographic area with similar demographics. Having a larger pool of participants from which to choose can help increase participation as well as lead to a sample that represents the teaching population more accurately in southeast Tennessee.
2. Though timing can be difficult to fully plan, beginning the data collection process in October, after teachers have had the opportunity to start the school year and have established classrooms, would be better to encourage more participation. The July window that was initially used was too close to the beginning of the school year and was also marred by the challenges of preparing for another school year with additional stressors, such as dealing with the COVID-19 pandemic. As such, there were fewer responses, which may have been due to teachers' requirements to learn new protocols and attend additional trainings prior to beginning the school year in early August.

3. Future research should work with the exceptional/special education departments and assistive technology departments to ensure there is equal representation of participants. Only 23% of the participants worked in special education, though the district make-up indicated the potential for a 50/50 split for the purposes of this study. Including the specialized departments could increase the likelihood of having a more representative population of special education teachers.
4. Future research should use a causal comparative design to investigate the potential relationship between the self-efficacy of general education and special education teachers. Given the smaller sample size, using causal comparative methods to investigate the data would be difficult and would likely yield inaccurate or inadequate results.

## REFERENCES

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology*, 32(4), 665-683.
- Aldabas, R. (2019). Barriers and facilitators of using augmentative and alternative communication with students with multiple disabilities in inclusive education: Special education teachers' perspectives. *International Journal of Inclusive Education*, 23(1), 1-17. <https://doi.org/10.1080/13603116.2019.1597185>
- Alkahtani, K. D. F. (2013). Teachers' knowledge and use of assistive technology for students with special educational needs. *Journal of Studies in Education*, 3(2), 65-86. <https://doi.org/10.5296/jse.v3i2.3424>
- Americans with Disabilities Act of 1990, Pub. L. No. 101-336, § 2, 104 Stat 328 (1991).
- Andzik, N., Chung, Y., Doneski-Nicol, J., & Dollarhide, C. (2019). AAC services in schools: a special educator's perspective. *International Journal of Developmental Disabilities*, 65(2), 89–97. <https://doi.org/10.1080/20473869.2017.1368909>
- Andzik, N. R., Chung, Y., & Kranak, M. P. (2016). Communication opportunities for elementary school students who use augmentative and alternative communication. *AAC: Augmentative & Alternative Communication*, 32(4), 272–281. <https://doi.org/10.1080/07434618.2016.1241299>
- Andzik, N. R., Schaefer, J. M., Nichols, R. T., & Chung, Y. (2018). National survey describing and quantifying students with communication needs. *Developmental Neurorehabilitation*, 21(1), 40-47. <https://doi.org/10.1080/17518423.2017.1339133>

- Arrah, R. O., & Swain, K. D. (2014). Teachers' perceptions of students with special education needs in Cameroon secondary schools. *International Journal of Special Education*, 29(3), 101-110. <https://files.eric.ed.gov/fulltext/EJ1045965.pdf>
- Assistive technology, 34 C. F. R. § 300.105 (2013).
- Atanga, C., Jones, B. A., Krueger, L. E., & Lu, S. (2020). Teachers of students with learning disabilities: Assistive technology knowledge, perceptions, interests, and barriers. *Journal of Special Education Technology*, 35(4), 236-248. <https://doi.org/10.1177/0162643419864858>
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191–215. <https://doi-org.ezproxy.liberty.edu/10.1037/0033-295X.84.2.191>
- Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of Clinical and Social Psychology*, 4, 359-373. <https://doi.org/10.1521/jscp.1986.4.3.359>
- Banning, M. (2005). Approaches to teaching: Current opinions and related research. *Nurse Education Today*, 25(7), 502-508. <https://doi.org/10.1016/j.nedt.2005.03.007>
- Bateman, D. F., & Cline, J. L. (2016). *A teacher's guide to special education*. ASCD.
- Baxter, S., Enderby, P., Evans, P., & Judge, S. (2012). Barriers and facilitators to the use of high-technology augmentative and alternative communication devices: A systematic review and qualitative synthesis. *International Journal of Language & Communication Disorders*, 47(2), 115-129. <https://doi.org/10.1111/j.1460-6984.2011.00090.x>
- Bentley-Williams, R., Grima-Farrell, C., Long, J., & Laws, C. (2017). Collaborative partnership: Developing pre-service teachers as inclusive practitioners to support students with

- disabilities. *International Journal of Disability, Development and Education*, 64(3), 270-282. <https://doi.org/10.1080/1034912X.2016.1199851>
- Beukelman, D., & Mirenda, P. (2013). *Augmentative and alternative communication: Supporting children and adults with complex communication needs* (4th ed.). Paul Brookes Publishing.
- Biggs, E. E., Carter, E. W., & Gustafson, J. R. (2017). Efficacy of collaborative planning and peer support arrangements to increase peer interaction and AAC use in inclusive classrooms. *American Journal on Intellectual and Developmental Disabilities*, 122, 25-48. <https://doi.org/10.1352/1944-7558-122.1.25>
- Black, L. I., Vahratian, A., & Hoffman, H. J. (2015). *Communication disorders and use of intervention services among children aged 3-17 years: United States, 2012* (Data Brief No. 205). National Center for Health Statistics, Centers for Disease Control and Prevention. <https://www.cdc.gov/nchs/products/databriefs/db205.htm>
- Blad, E. (2020, January 10). *Why the feds still fall short on special education funding calls to fully fund IDEA heard on the campaign trail*. Education Week. <https://www.edweek.org/ew/articles/2020/01/15/why-the-feds-still-fall-short-on.html>
- Bouck, E. C. (2016). A national snapshot of assistive technology for students with disabilities. *Journal of Special Education Technology*, 31(1), 4-13. <https://doi.org/10.1177/0162643416633330>
- Bornman, J., & Donohue, D. K. (2013). South African teachers' attitudes toward learnings with barriers to learning: Attention-deficit and hyperactivity disorder and little or no functional speech. *International Journal of Disability, Development and Education*, 60(2), 85-104. <https://doi.org/10.1080/1034912X.2013.786554>



- Brady, N. C., Bruce, S., Goldman, A., Erickson, K., Mineo, B., Ogletree, B. T., . . . Wilkinson, K. (2016). Communication services and supports for individuals with severe disabilities: Guidance for assessment and intervention: AJMR. *American Journal on Intellectual and Developmental Disabilities, 121*(2), 121-138,165-168. <https://doi.org/10.1352/1944-7558-121.2.121>
- Canrinus, E.T. (2017). Coherent teacher education programmes: Taking a student perspective. *Journal of Curriculum Studies, 49*(3), 313-333. <https://doi.org/10.1080/00220272.2015.1124145>
- Caron, J., Light, J., & Drager, K. (2016). Operational demands of AAC mobile technology applications on programming vocabulary and engagement during professional and child interactions. *AAC: Augmentative and Alternative Communication, 32*(1), 12–24. <https://doi.org/10.3109/07434618.2015.1126636>
- Chazin, K. T., Barton, E. E., Ledford, J. R., & Pokorski, E. A. (2018). Implementation and intervention practices to facilitate communication skills for a child with complex communication needs. *Journal of Early Intervention, 40*(2), 138–157. <https://doi.org/10.1177/1053815118771397>
- Columna, L., Hoyos-Cuartas, L. A., Foley, J. T., & Prado-Perez, J. R. (2016). Latin American physical educators' intention to teach individuals with disabilities. *Adapted Physical Activity Quarterly, 33*, 213-232. <http://dx.doi.org/10.1123/APAQ.2014-0167>
- Creswell, J. W. & Poth, C. N. (2018). *Qualitative inquiry & research design: Choosing among five approaches* (4th ed.). SAGE Publications.

- Dada, S. (1999). *Teachers' attitudes towards students with LNFS using two AAC devices* [Master's thesis, University of Pretoria]. University of Pretoria Institutional Repository. <http://hdl.handle.net/2263/26940>
- Dada, S., Horn, T., Samuels, A., & Schlosser, R. W. (2016). Children's attitudes toward interaction with an unfamiliar peer with complex communication needs: Comparing high- and low-technology devices. *Augmentative and Alternative Communication, 32*(4), 305-311. <https://doi.org/10.1080/07434618.2016.1216597>
- Dapudong, R. C. (2014). Teachers' knowledge and attitude towards inclusive education: Basis for an enhanced professional development program. *International Journal of Learning and Development, 4*(4), 1-24. <https://doi.org/10.5296/ijld.v4i4.6116>
- DeCarlo, J., Bean, A., Lyle, S., & Cargill, L. P. M. (2019). The relationship between operational competency, buy-in, and augmentative and alternative communication use in school-age children with autism. *American Journal of Speech-Language Pathology, 28*(2), 469-484. [http://dx.doi.org.ezproxy.liberty.edu/10.1044/2018\\_AJSLP-17-0175](http://dx.doi.org.ezproxy.liberty.edu/10.1044/2018_AJSLP-17-0175)
- Department of Communities, Disability Services, and Seniors (The State of Queensland). (2018). *Complex communication needs* (3<sup>rd</sup> ed.). [https://www.qld.gov.au/\\_\\_data/assets/pdf\\_file/0022/58540/complex-communication-needs.pdf](https://www.qld.gov.au/__data/assets/pdf_file/0022/58540/complex-communication-needs.pdf)
- Donne, V. (2016). Young adult books: Helping to prepare teachers for augmentative alternative communication. *International Journal of Special Education, 31*(2). <https://files.eric.ed.gov/fulltext/EJ1111076.pdf>
- Education for All Handicapped Children Act, 20 U.S.C. § 1401 (1975).
- Erdem, R. (2017). Students with special educational needs and assistive technologies: A

- literature review. *TOJET: The Turkish Online Journal of Educational Technology*, 16(1), 128-146. Retrieved from <http://ezproxy.liberty.edu/login?url=https://search-proquest-com.ezproxy.liberty.edu/docview/1889347686?accountid=12085>
- Erickson, K. A., & Geist, L. A. (2016). The profiles of students with significant cognitive disabilities and complex communication needs. *AAC: Augmentative & Alternative Communication*, 32(3), 187–197. <https://doi.org/10.1080/07434618.2016.1213312>
- Every Student Succeeds Act, 20 U.S.C. § 6301 (2015).  
<https://www.congress.gov/114/plaws/publ95/PLAW-114publ95.pdf>
- Ford, T. G., Van Sickle, M. E., Clark, L. V., Fazio-Brunson, L., & Schween, D. C. (2017). Teacher self-efficacy, professional commitment, and high-stakes teacher evaluation policy in Louisiana. *Educational Policy*, 31(2), 202-248.  
<https://doi.org/10.1177/0895904815586855>
- Fuchs, W.W. (2010). Examining teachers’ perceived barriers associated with inclusion. *SRATE Journal*, 19(1), 30-35. <https://files.eric.ed.gov/fulltext/EJ948685.pdf>
- Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational research: An introduction* (8th ed.). Pearson.
- Gallois, C., Ogay, T., & Giles, H. (2005). Communication accommodation theory: A look back and a look ahead. In W. B. Gudykunst (Ed.), *Theorizing about intercultural communication* (pp. 121-148). SAGE Publications.
- Gee, K., & Gonsier-Gerdin, J. (2018). The first year as teachers assigned to elementary and middle-school special education classrooms. *Research and Practice for Persons with Severe Disabilities*, 43(2), 94-110. <https://doi.org/10.1177/1540796918771708>

- Giles, H., Mulac, A., Bradac, J. J., & Johnson, P. (1987). Speech accommodation theory: The first decade and beyond. *Communication Yearbook*, 10(1), 13-48. Retrieved from [https://www.researchgate.net/publication/242371336\\_Speech\\_Accommodation\\_Theory\\_The\\_First\\_Decade\\_and\\_Beyond](https://www.researchgate.net/publication/242371336_Speech_Accommodation_Theory_The_First_Decade_and_Beyond)
- Giles, H., & Ogay, T. (2007). Communication accommodation theory. In B. B. Whaley & W. Samter (Eds.), *Explaining communication: Contemporary theories and exemplars* (pp. 293-310). Mahwah, NJ: Lawrence Erlbaum.
- Grant, C., & Osanloo, A. (2014). Understanding, selecting, and integrating a theoretical framework in dissertation research: Creating the blueprint for your “house”. *Administrative Issues Journal: Connecting Education, Practice, and Research*, 4(2), 12-26. <https://doi.org/10.5929/2014.4.2.9>
- Green, S. B., & Salkind, N. J. (2017). *Using SPSS for Windows and Macintosh: Analyzing and understanding the data* (8th ed.). Pearson.
- Hamm, B., & Mirenda, P. (2006). Post-school quality of life for individuals with developmental disabilities who use AAC. *Augmentative and Alternative Communication: AAC*, 22(2), 134-147. <https://doi.org/10.1080/07434610500395493>
- Hanline, M. H., Dennis, L. R., & Warren, A. W. (2018). The outcomes of professional development on AAC use in preschool classrooms. *Infants & Young Children*, 31(3), 231-245. <https://doi.org/10.1097/IYC.0000000000000120>
- Hansen-Thomas, H., Richins, L. G., Kakkar, K., & Okeyo, C. (2016). I do not feel I am properly trained to help them! Rural teachers’ perceptions of challenges and needs with English-language learners. *Professional Development in Education*, 42(2), 308-324. <https://doi.org/10.1080/19415257.2014.973528>

- Hayden, J. (2019). Self-efficacy theory. In *Introduction to Health Behavior Theory* (3rd ed.) (pp. 11-33). Burlington, MA: Jones & Bartlett Learning.
- Hopper, J. (2017, February 8). How many questions in a 10-minute survey? *Versta Research*.  
<https://verstaresearch.com/blog/how-many-questions-in-a-10-minute-survey/>
- Hyppa-Martin, J., Collins, D., Chen, M., Amundson, C., Timinski, K., and Mizuko, M. (2016). Comparing first graders' attitudes and preferences toward a peer using an iPad-based speech-generating device and a non-electronic AAC system. *Augmentative and Alternative Communication*, 32(2), 94-104.  
<https://doi.org/0.3109/07434618.2016.1146332>
- Individuals with Disabilities Education Act, 20 U.S.C. § 1400 (2004).  
<https://sites.ed.gov/idea/statute-chapter-33/subchapter-i/1400/c/5>
- Institute of Education Sciences. (2019). *American Community Survey – Education tabulation: School district demographic dashboard 2014-18*.  
<https://nces.ed.gov/Programs/Edge/ACSDashboard/4701590>
- Isbell, L., & Szabo, S. (2015). Assessment: Teacher efficacy and response to intervention. *Delta Kappa Gamma Bulletin International Journal*, 81(2), 41-46.
- Jahnukainen, M. (2015). Inclusion, integration, or what? A comparative study of the school principals' perceptions of inclusive and special education in Finland and in Alberta, Canada. *Disability & Society*, 30(1), 59-72.  
<https://doi.org/10.1080/09687599.2014.982788>
- Kanjere, M. (2017). The significance of training school principals and educators in managing inclusive education. *Gender & Behaviour*, 15(2), 8744–8747.

- Kathard, H., Pillay, D., & Pillay, M. (2015). A study of teacher-learner interactions: A continuum between monologic and dialogic interactions. *Language, Speech, & Hearing Services in Schools, 46*(3), 222-241. [https://doi.org/10.1044/2015\\_LSHSS-14-0022](https://doi.org/10.1044/2015_LSHSS-14-0022)
- Klassen, R. M., & Chiu, M. M. (2010). Effects on teachers' self-efficacy and job satisfaction: Teacher gender, years of experience, and job stress. *Journal of Educational Psychology, 102*(3), 741-756. <https://doi.org/10.1037/a0019237>
- Kleinert, H., Towles-Reeves, E., Quenemoen, R., Thurlow, M., Fluegge, L., Weseman, L., & Kerbel, A. (2015). Where students with the most significant cognitive disabilities are taught: Implications for general curriculum access. *Exceptional Children, 81*(3), 312-328. <https://doi.org/10.1177/0014402914563697>
- Koh, Y. (2018). A strategy to improve pre-service teachers' self efficacy towards inclusive physical education for students with intellectual disability and autism. *International Journal of Inclusive Education, 22*(8), 839-855. <https://doi.org/10.1080/13603116.2017.1412511>
- Koh, M., & Shin, S. (2017). Education of students with disabilities in the USA: Is inclusion the answer? *International Journal of Learning, Teaching and Educational Research, 16*, 1-17. <https://doi.org/10.26803/IJLTER.16.10.1>
- Kurniawati, F., de Boer, A. A., Minnaert, A. E. M. G., & Mangunson, F. (2017). Evaluating the effect of a teacher training programme on the primary teachers' attitudes, knowledge and teaching strategies regarding special educational needs. *Educational Psychology, 37*(3), 287-297. <https://doi.org/10.1080/01443410.2016.1176125>

- Laughlin, M. K., Murata, N. M., Gonnelli, M., & Larranaga, J. (2018). Assistive technology: What physical educators need to know. *The Journal of Physical Education, Recreation, & Dance*, 89(3), 38-45. <https://doi.org/10.1080/07303084.2017.1417930>
- Light, J., & McNaughton, D. (2015). Designing AAC research and intervention to improve outcomes for individuals with complex communication needs. *Augmentative and Alternative Communication*, 31, 85-96. <https://doi.org/10.3109/07434618.2015.1036458>
- Light, J., McNaughton, D., & Caron, J. (2019). New and emerging AAC technology supports for children with complex communication needs and their communication partners: State of the science and future research directions. *Augmentative and Alternative Communication*, 35(1), 26-41. <https://doi.org/10.1080/07434618.2018.1557251>
- Locke, P. A., & Mirenda, P. (1992). Roles and responsibilities of special education teachers serving on teams delivering AAC services. *Augmentative and Alternative Communication*, 8(3), 200-214. <https://doi.org/10.1080/07434619212331276193>
- Lund, S. K., Quach, W., Weissling, K., McKelvey, M., & Dietz, A. (2017). Assessment with children who need augmentative and alternative communication (AAC): Clinical decisions of AAC specialists. *Language, Speech & Hearing Services in Schools (Online)*, 48(1), 56-68. [https://doi.org/10.1044/2016\\_LSHSS-15-0086](https://doi.org/10.1044/2016_LSHSS-15-0086)
- Luterbach, K. J., & Brown, C. (2011). Education for the 21st century. *International Journal of Applied Educational Studies*, 11(1), 14-32. Retrieved from <http://ezproxy.liberty.edu/login?url=https://search-proquest-com.ezproxy.liberty.edu/docview/900116106?accountid=12085>
- Mangrum, M. (2018, July 22). School district, community outline plan to address 'systemic issues' in special education. *Chattanooga Times Free Press*. <https://bit.ly/2RuubAD>

- McNaughton, D., Light, J., Beukelman, D., Klein, C., Nieder, D., & Nazareth, G. (2019). Building capacity in AAC: A person-centered approach to supporting participation by people with complex communication needs. *Augmentative and Alternative Communication*, 35(1), 56–68. <https://doi.org/10.1080/07434618.2018.1556731>
- McFarland, J., Hussar, B., Zhang, J., Wang, X., Wang, K., Hein, S., Diliberti, M., Forrest Cataldi, E., Bullock Mann, F., and Barmer, A. (2019). *The condition of education 2019* (NCES 2019-144). National Center for Education Statistics, U.S. Department of Education. [https://nces.ed.gov/programs/coe/indicator\\_cgg.asp](https://nces.ed.gov/programs/coe/indicator_cgg.asp)
- Mezquita-Hoyos, Y. N., Sanchez-Monroy, M. H., Morales-Martinez, G. E., Lopez-Ramirez, E. O., & Reyna-Gonzales, M. R. (2018). Regular and special education Mexican teachers' attitudes toward school inclusion and disability. *European Journal of Educational Research*, 7(3), 421-430. <https://doi.org/10.12973/eu-jer.7.3.421>
- Mirenda, P., Iacono, T., & Williams, R. (1990). Communication options for persons with sever and profound disabilities: State of the art and future directions. *Research and Practice for Persons with Severe Disabilities*, 15(1), 3-21. <https://doi.org/10.1177%2F154079699001500102>
- Mngo, Z. Y. & Mngo, A. Y. (2018). Teachers' perceptions of inclusion pilot inclusive education program: Implications for instructional leadership. *Education Research International*, 2018, 13. <https://doi.org/10.1155/2018/3524879>
- Moorcroft, A., Scarinci, N., & Meyer, C. (2020). 'We were just kind of handed it and then it was smoke bombed by everyone': How do external stakeholders contribute to parent rejection and the abandonment of AAC systems? *International Journal of Language & Communication Disorders*, 55(1), 59-69. <https://doi.org/10.1111/1460-6984.12502>



- National Council on Disability. (2018). *Broken promises: The underfunding of IDEA*.  
[https://ncd.gov/sites/default/files/NCD\\_BrokenPromises\\_508.pdf](https://ncd.gov/sites/default/files/NCD_BrokenPromises_508.pdf)
- Naguib Bedwani, M., Bruck, S., & Costley, D. (2015). Augmentative and alternative communication for children with autism spectrum disorder: An evidence-based evaluation of the Language Acquisition through Motor Planning (LAMP) programme. *Cogent Education*, 2(1), Article 1045807.  
<https://doi.org/10.1080/2331186X.2015.1045807>
- Norburn, K., Levin, A., Morgan, S., & Harding, C. (2016). A survey of augmentative and alternative communication used in an inner city special school. *British Journal of Special Education*, 43(3), 289-306. <https://doi.org/10.1111/1467-8578.12142>
- Ogirima, O. A., Emilia, O. O., & Juliana, O. B. (2017). Teachers' attitude and competence in the use of assistive technologies in special needs schools. *Acta Didactica Napocensia*, 10(4), 21-32. Retrieved from <http://ezproxy.liberty.edu/login?url=https://search-proquest-com.ezproxy.liberty.edu/docview/1987372207?accountid=12085>
- Oppermann, E., Brunner, M., & Anders, Y. (2019). The interplay between preschool teachers' science self-efficacy beliefs, their teaching practices, and girls' and boys' early science motivation. *Learning and Individual Differences*, 70, 86-99.  
<https://doi.org/10.1016/j.lindif.2019.01.006>
- Østvik, J., Balandin, S., & Ytterhus, B. (2017). A "Visitor in the class": Marginalization of students using AAC in mainstream education classes. *Journal of Developmental and Physical Disabilities*, 29(3), 419-441. <https://doi.org/10.1007/s10882-017-9533-5>
- Peckham-Hardin, K. D., Hanreddy, A., & Ogletree, B. T. (2018). Preparing teachers to facilitate communication skills in students with severe disabilities (Document No. IC17).

- University of Florida: Collaboration for Effective Educator Development, Accountability, and Reform Center. <http://cedar.education.ufl.edu/tools/innovation-configurations/>
- Perren, S., Herrmann, S., Iljuschin, I., Frei, D., Körner, C., & Sticca, F. (2017). Child-centred educational practice in different early education settings: Associations with professionals' attitudes, self-efficacy, and professional background. *Early Childhood Research Quarterly*, 38, 137-148. <https://doi.org/10.1016/j.ecresq.2016.07.001>
- Petcu, S., Yell, M., & Fletcher, T. (2014). Assistive technology: Legislation and legal issues. *Exceptionality*, 22(4), 226-236. <https://doi.org/10.1080/09362835.2013.865538>
- Radici, E., Heboyan, V., Mantovani, F., & De Leo, G. (2019). Teachers' attitudes towards children who use AAC in Italian primary schools. *International Journal of Disability, Development, and Education*, 66(3), 284-297. <https://doi.org/10.1080/1034912X.2018.1495321>
- Radici, E., Heboyan, V., Mantovani, F., & De Leo, G. (2020). Attitudes and perceived communicative competence: The impact of different AAC means of communication among Italian teenagers. *International Journal of Disability, Development, and Education*, 1-11. <https://doi.org/10.1080.1034912X.2020.1740185>
- Rehabilitation Act of 1973, 29 U.S.C. § 701 *et seq.* (1973). <https://www2.ed.gov/policy/rights/reg/ocr/34cfr104.pdf>
- Roussinos, D., & Jimoyiannis, A. (2019). Examining primary education teachers' perceptions of TPACK and the related educational context factors. *Journal of Research on Technology in Education*, 51(4), 377-397. <https://doi-org.ezproxy.liberty.edu/10.1080/15391523.2019.1666323>

- Ruppar, A. L., Neeper, L. S., & Dalsen, J. (2016). Special education teachers' perceptions of preparedness to teach students with severe disabilities. *Research and Practice for Persons with Severe Disabilities, 41*(4), 273-286.  
<https://dx.doi.org/10.1177/1540796916672843>
- Saloviita, T. (2020). Teacher attitudes towards the inclusion of students with support needs. *JORSEN: Journal of Research in Special Needs Education, 20*(1), 64-73.  
<https://doi.org/10.1111/1471-3802.12466>
- Schaaf, D. N. (2018). Assistive technology instruction in teacher professional development. *Journal of Special Education Technology, 33*(3), 171–181.  
<https://doi.org/10.1177/0162643417753561>
- Sharma, U., Aiello, P., Pace, E. M., Round, P., & Subban, P. (2018). In-service teachers' attitudes, concerns, efficacy and intentions to teach in inclusive classrooms: An international comparison of Australian and Italian teachers. *European Journal of Special Needs Education, 33*(3), 437-446. <https://doi.org/10.1080/08856257.2017.1361139>
- Sharma, U., & Jacobs, D. K. (2016). Predicting in-service educators' intentions to teach in inclusive classrooms in India and Australia. *Teaching and Teacher Education, 55*, 13-23.  
<http://dx.doi.org/10.1016/j.tate.2015.12.004>
- Shea, S. (2019). Listening to the powerless: Experiences of people with severe intellectual disabilities in an evangelical church. *Religions, 10*(4), 287.  
<https://doi.org/10.3390/re110040287>
- Shoulders, T. L., & Krei, M. S. (2016). Rural secondary educators' perceptions of their efficacy in the inclusive classroom. *Rural Special Education Quarterly, 35*(1), 23-30.

- Sigafoos, J., & Gevarter, C. (2019). Introduction to the special issue: Communication intervention for individuals with complex communication needs. *Behavior Modification, 43*(6), 767–773. <https://doi.org/10.1177/0145445519868809>
- Simmons-Mackie, N. (2018). Communication partner training in aphasia: Reflections on communication accommodation theory. *Aphasiology, 32*(10), 1215-1224. <https://doi.org/10.1080/02687038.2018.1428282>
- Skaalvik, E. M., & Skaalvik, S. (2018). Job demands and job resources as predictors of teachers' motivation and well-being. *Social Psychology of Education: An International Journal, 21*(5), 1251-1275. <https://doi.org/10.1007/s11218-018-9464-8>
- Smucker, L. M. D., McCarthy, J. W., Benigno, J. P., & Boster, J. B. (2018). Personal contact through personal narratives: Attitudes of fifth-grade children toward children who use augmentative and alternative communication. *Journal of Advances in Education Research, 3*(3), 148-157. <https://doi.org/0.22606/jaer.2018.33003>
- Snodgrass, M. R., & Meadan, H. (2018). A boy and his AAC team: Building instructional competence across team members. *Augmentative and Alternative Communication, 34*(3), 167-179. <https://doi.org/10.1080/07434618.2018.1491059>
- Soto, G. (1997). Special education teacher attitudes toward AAC: Preliminary survey. *Augmentative and Alternative Communication, 13*(3), 186-197. <https://doi.org/10.1080/07434619712331278008>
- Subban, P., & Mahlo, D. (2017). 'My attitude, my responsibility': Investigating the attitudes and intentions of pre-service teachers toward inclusive education between teacher preparation cohorts in Melbourne and Pretoria. *International Journal of Inclusive Education, 21*(4), 441-461. <https://doi.org/10.1080/13603116.2016.1197322>

- Taimalu, M. & Luik, P. (2019). The impact of beliefs and knowledge on the integration of technology among teacher educators: A path analysis. *Teaching and Teacher Education*, 79, 101-110. <https://doi.org/10.1016/j.tate.2018.12.012>
- Tamakloe, D., & Agbenyega, J. S. (2017). Exploring preschool teachers' and support staff's use and experiences of assistive technology with children with disabilities. *Australasian Journal of Early Childhood*, 42(2), 29-36. <http://doi.org/10.23965/AJEC/42.2.04>
- Tegler, H., Pless, M., Johansson, M. B., & Sonnander, K. (2019). Caregivers', teachers', and assistants' use and learning of partner strategies in communication using high-tech speech-generating devices with children with severe cerebral palsy. *Assistive Technology*. <https://doi.org/10.1080/10400435.2019.1581303>
- Therrien, M., & Light, J. (2018). Promoting peer interaction for preschool children with complex communication needs and autism spectrum disorders. *American Journal of Speech Language Pathology*, 27, 201-221. [https://doi.org/10.1044/2017\\_AJSLP-17-0104](https://doi.org/10.1044/2017_AJSLP-17-0104)
- Tönsing, K., & Dada, S. (2016). Teachers' perceptions of implementation of aided AAC to support expressive communication in South African special schools: a pilot investigation. *Augmentative and Alternative Communication: AAC*, 32(4), 282–304. <https://doi.org/10.1080/07434618.2016.1246609>
- Tönsing, K. M., van Niekerk, K., Schlünz, G., & Wilken, I. (2019). Multilingualism and augmentative and alternative communication in south Africa – exploring the views of persons with complex communication needs. *African Journal of Disability*, 8, e1-e13. <https://doi.org/10.4102/ajod.v8i0.507>

- United Nations Educational, Scientific and Cultural Organization (UNESCO). (2020). *Global education monitoring report 2020: Inclusion and education: All means all*. <https://gem-report-2020.unesco.org/>
- U.S. Department of Education, Office of Educational Technology. (2017). *Reimagining the Role of Technology in Education: 2017 National Education Technology Plan Update*, Washington, D.C. <https://tech.ed.gov/files/2016/12/Ed-Tech-in-Teacher-Preparation-Brief.pdf>
- U.S. Department of Education, Office of Educational Technology. (2016). *Advancing Educational Technology in Teacher Preparation: Policy Brief*, Washington, D.C.
- Waddington, H., van der Meer, L., Carnett, A., & Sigafos, J. (2017). Teaching a child with ASD to approach communication partners and use a speech-generating device across settings: Clinic, school, and home. *Canadian Journal of School Psychology, 32*(3-4), 228-243. <https://doi.org/10.1177/0829573516682812>
- Walton, E. & Rusznyak, L. (2017). Choices in the design of inclusive education courses for pre-service teachers: The case of a South African university. *International Journal of Disability, Development, & Education, 64*(3), 231-248. <https://doi.org/10.1080/1034912X.2016.1195489>
- Warner, R. M. (2013). *Applied statistics: From bivariate through multivariate techniques* (2nd ed.). SAGE Publications.
- Webb, E. J. D., Lynch, Y., Meads, D., Judge, S., Randall, N., Goldbart, J., Meredith, S., Moulam, L., Hess, S., & Murray, J. (2019). Finding the best fit: Examining the decision-making of augmentative and alternative communication professionals in the UK using a

discrete choice experiment. *BMJ Open*, 9(11), Article e030274.

<https://doi.org/10.1136/bmjopen-2019-030274>

Williams, T. O., Jr., Ernst, J. V., & Rossi, L. (2018). Teaching credentials in the inclusive STEM classroom. *Journal of STEM Education: Innovations and Research*, 19(4), 30-34.

Retrieved from <http://ezproxy.liberty.edu/login?url=https://search-proquest-com.ezproxy.liberty.edu/docview/2174214619?accountid=12085>

Woodcock, S., & Woolfson, L. M. (2019). Are leaders leading the way with inclusion?

Teachers' perceptions of systemic support and barriers towards inclusion. *International Journal of Educational Research*, 93, 232-242. <https://doi.org/10.1016/j.ijer.2018.11.004>

Woodfield, C., & Ashby, C. (2015). 'The right path of equality': Supporting high school students with autism who type to communicate. *International Journal of Inclusive Education*, 20(4), 435-454. <https://doi.org/10.1080/13603116.2015.1088581>

WTVC. (2018, August 15). *Tennessee Department of Education releases report on educator diversity*. WTVC News Channel 9. <https://newschannel9.com/news/local/tennessee-department-of-education-releases-report-on-educator-diversity>

Zee, M., & Koomen, H. M. Y. (2016). Teacher self-efficacy and its effects on classroom processes, student academic adjustment, and teacher well-being: A synthesis of 40 years of research. *Review of Educational Research*, 86(4), 981-1015.  
<https://doi.org/10.3102/0034654315626801>

## APPENDIX A: Request and Permission to Use/Reproduce Instrument

### Seeking Permission to Use Survey

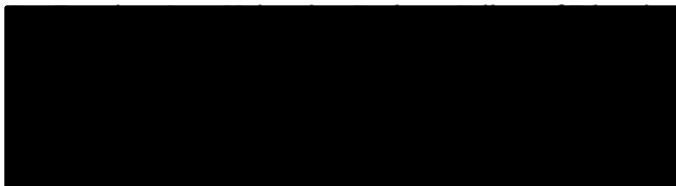
Parks, Tamara Therese <ttparks@liberty.edu>

Wed 10/7/2020 12:39 PM

To: [REDACTED]

October 7, 2020

Dr. Gloria Soto



Dear Dr. Soto:

I am a doctoral student from Liberty University writing my dissertation tentatively titled "Teachers' Self-Efficacy and Augmentative and Assistive Communication Technology Use". I would like your permission to reproduce the survey items from your 1997 article, "Special Education Teacher Attitudes toward AAC: Preliminary Survey" from the journal *Augmentative and Alternative Communication*, in my research study. I would like to use the items on the Qualtrics web-based survey software tool, which has been approved by Liberty University for use in constructing and distributing surveys for data collection. I would use your survey under the following conditions:

- I will only use the surveys for my research study. I will not sell or use it with any compensated or curriculum development activities.
- I will include a copyright statement on the survey in Qualtrics prior to dissemination.
- I will send a copy of my research study to your attention upon completion of the study.

If these are acceptable terms and conditions, please indicate so by replying to me via email: [ttparks@liberty.edu](mailto:ttparks@liberty.edu)

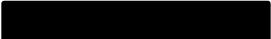
Thank you for your time and consideration.

Sincerely,

Tamara Parks



[External] Re: Seeking Permission to Use Survey

Gloria Soto 

Wed 10/7/2020 1:43 PM

To: Parks, Tamara Therese <ttparks@liberty.edu>

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[ EXTERNAL EMAIL: Do not click any links or open attachments unless you know the sender and trust the content. ]

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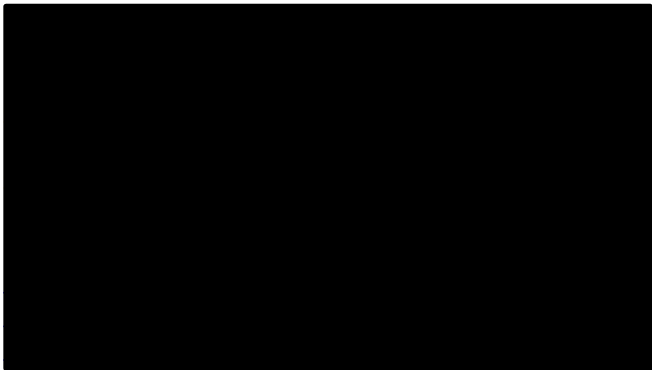
Dear Tamara

You are most welcome to use my survey and modify it as needed, and you can cite the original source.

Thanks. Let me know if I can be of any further help.

Dr. Soto

Gloria Soto, Ph.D.



## APPENDIX B: TASTA – Teacher Attitudinal Scale toward AAC

Q1: Have you worked with students who have received speech and language services (privately and/or as part of an individualized education plan)?

- Yes
- No

*(Skip to end of survey if no)*

Q1a: Have you ever used an augmentative and alternative communication (AAC) device of any kind with students?

- Yes
- No

*(Skip to end of survey if no)*

### Q2: Teachers' Self-Efficacy and Augmentative and Alternative Communication Technology Use

You are invited to be in a research study to investigate whether teachers' intentions to use augmentative and alternative communication devices and perceptions of students who use them can be predicted by their reported self-efficacy. You are a possible participant if you have taught kindergarten through eighth grade in this district and have had students who have used speech and language services. Please read the following information and ask any questions you may have before agreeing to participate.

Tamara Parks, a doctoral candidate in the School of Education at Liberty University, is conducting this study.

Q3: Consent Form Information

Q4: Please enter your email address to be entered into a drawing for one of three \$50 Amazon gift cards. Your email address will NOT be used for any distribution lists and will not be included in reported data.

---

Q5: What is your gender?

- Male
- Female

- Other

Q6: How many years have you been an educator?

- Less than 2 years
- 2-5 years
- 5-10 years
- Greater than 11 years

Q7: Identify the grade level ranges with which you work. (Select all that apply.)

- Kindergarten – 5<sup>th</sup> grade
- 6<sup>th</sup> – 8<sup>th</sup> grade
- 9<sup>th</sup> – 12<sup>th</sup> grade

Q8: What is your current education level?

- Bachelor's degree
- Master's degree
- Ed.S.
- Ph.D. or Ed.D.

Q9: Choose one or more races that you consider yourself to be:

- White
- Black or African American
- Spanish, Hispanic, or Latino
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Pacific Islander
- Other

Q10: What best describes your current role?

- General Education Teacher (includes those who teach in an inclusive classroom)
- Special or Exceptional Education Teacher

Q11: How would you describe your exposure to augmentative and alternative communication (AAC) training?

- In college/university
- Through conferences and/or professional development (in-services)
- None

Q12: Do you have any past experience using an augmentative and alternative communication (AAC) option, such as picture boards or devices dedicated to communication (e.g., LAMP Words for Life, Accent, GoTalk, etc.)?

- Yes
- No

***END OF BLOCK***

**Factor 1 Block**

Q13: Read the statements below and consider students with disabilities, especially those with complex communication needs. Indicate to what extent you agree or disagree with each statement.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
All students regardless of the severity of their disability have the potential to learn how to communicate more effectively.					
I am confident that some of my students can learn to communicate more effectively.					
There is not much I can do to improve the communication skills of some of my students.					
Some of my students do not show any motivation and/or interest in communicating.					

**END OF FACTOR 1 BLOCK****Factor 2 Block**

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
The speech-language clinician and I should work together to develop communication goals for my students.					
My teacher training program and/or experience has given me the necessary skills to try to improve the communication skills of my students through the use of augmentative communication options.					
When a student makes progress in communicating more effectively, I feel it is because I have exerted a little extra effort.					
When my students' communication skills improve it is usually because I have found more effective teaching approaches.					
I feel that I have the skills to teach my students how to communicate more effectively.					
I feel that part of my responsibility as a teacher is to work on improving the communication skills of my students.					

**END OF FACTOR 2 BLOCK****Factor 3 Block**

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
The amount of time that the speech-language clinician spends with each student is sufficient to improve the student's communication skills.					
The speech-language clinician is responsible for communication intervention in my classroom.					

Communication goals should be written by the speech-language clinician.					
---	--	--	--	--	--

***END OF FACTOR 3 BLOCK*****Factor 4 Block**

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
One of the highest priorities in teaching students with disabilities should be to provide them with socially acceptable ways to communicate with family and community.					
Working on communication skills is a critical part of educating students with disabilities.					
I think it is fundamental to provide students with disabilities with ways to communicate more effectively.					

***END OF FACTOR 4 BLOCK*****Factor 5 Block**

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Without support from the administration, a teacher would fail to use augmentative communication techniques in the classroom.					
The availability of teaching aides would increase the likelihood that a teacher would use augmentative communication techniques in the classroom.					
A teacher would fail to use augmentative communication techniques in the classroom without the support of a good speech-language clinician.					

If a teacher as adequate motivation, she/he would try to use augmentative communication options in the classroom even without support from the administration.					
Lack of time is an important reason why a teacher would not use augmentative communication techniques in the classroom.					
If a teacher has adequate motivation, she/he would try to use augmentative communication options in the classroom even without formal training.					
If a teacher has adequate motivation, she/he would try to use augmentative communication options in the classroom even without support from the parents.					
Augmentative communication techniques would fail to be successful in the classroom without support from the parents.					
Lack of support from the administration would hinder me from providing and using augmentative communication options with my students.					
Lack of support from parents would hinder me from providing and using augmentative communication with my students.					
I would provide and use augmentative communication techniques in my classroom if I had a good speech-language clinician on whom to rely.					
Lack of formal training would hinder me from providing and using augmentative communication options with my students.					
Lack of time would hinder me from providing and using augmentative communication options with my students.					<b>END OF SURVEY</b>

## APPENDIX C: IRB Approval Letter

Firefox

<https://outlook.office.com/mail/deeplink?popoutv2=1&version=202109...>

[External] IRB-FY20-21-774 - Initial: Initial - Exempt

do-not-reply@cayuse.com <do-not-reply@cayuse.com>

Mon 5/31/2021 4:27 PM

To:

[ EXTERNAL EMAIL: Do not click any links or open attachments unless you know the sender and trust the content. ]

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# LIBERTY UNIVERSITY.

## INSTITUTIONAL REVIEW BOARD

May 31, 2021

Tamara Parks  
Laura Mansfield

Re: IRB Exemption - IRB-FY20-21-774 Teachers' Self-Efficacy and Augmentative and Alternative Communication Use

Dear Tamara Parks, Laura Mansfield:

The Liberty University Institutional Review Board (IRB) has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and no further IRB oversight is required.

Your study falls under the following exemption category, which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46: 101(b):

Category 2.(i). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording).

The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects.

Your stamped consent form(s) and final versions of your study documents can be found under the Attachments tab within the Submission Details section of your study on Cayuse IRB. Your stamped consent form(s) should be copied and used to gain the consent of your research participants. If you plan to provide your consent information electronically, the contents of the attached consent document(s) should be made available without alteration.

Please note that this exemption only applies to your current research application, and any



modifications to your protocol must be reported to the Liberty University IRB for verification of continued exemption status. You may report these changes by completing a modification submission through your Cayuse IRB account.

If you have any questions about this exemption or need assistance in determining whether possible modifications to your protocol would change your exemption status, please email us at [irb@liberty.edu](mailto:irb@liberty.edu).

Sincerely,

**G. Michele Baker, MA, CIP**

*Administrative Chair of Institutional Research*

**Research Ethics Office**

## APPENDIX D: Research Application Request and Approval

EVA

<https://outlook.office.com/mail/acceptmail/popout?z=1&version=2>

### Research application

[REDACTED]

Sat 2/20/2021 2:50 PM

To: [REDACTED]  
[REDACTED]

2 attachments (529 KB)

Parks\_Tamara\_HCDE Research Application Request.pdf; Parks\_Tamara\_ConsentFormDraft.pdf;

### Greetings!

My name is Tamara Parks and I am a doctoral candidate of the School of Education at Liberty University. The research I wish to conduct for my dissertation involves teachers' self-efficacy and augmentative and alternative communication (AAC) device use in the southeast Tennessee area. This study will be conducted under the supervision of my dissertation chair, Dr. Laura Mansfield.

*Pending IRB approval*, I am seeking your consent to contact kindergarten through eighth grade educators using the district's email database to participate in this study.

I have attached the research application and a draft of the consent form that will be included in initial email contact with participants as well as at the beginning of the online survey they are to complete. Once IRB approval is finalized, that documentation will also be submitted.

Upon completion of the study, I will provide a copy of the findings to [REDACTED] Schools. If you require any further information, please do not hesitate to contact me at [REDACTED]. Thank you for your time and consideration in this matter.

Sincerely,

Tamara Parks, MEd




Hamilton County Department of Education



March 16, 2021

Ms. Tamara Parks,

We are pleased to inform you that your application for research in Hamilton County Department of Education has been approved by the Research Approval Committee. This approval is contingent upon school approval from each school administrator before proceeding. The district approval is the first layer, and then school level approved is needed in order to conduct research at any of the schools listed.

The division of Accountability and Research is here to support you as you complete your research. If you have any specific questions, please reach out to Gayle Patterson  with any questions and she can direct you to the most appropriate contact within our office.

We look forward to receiving a final copy of your findings, sent by email to Gayle Patterson, once your research is complete.

Sincerely,



Shannon Moody  
Director of Accountability and Research



## APPENDIX E: Consent Form Draft

The consent form will be included as the first section for those who click on the link to participate in the survey. They will also receive a copy of the consent form and information in the initial email received.

### CONSENT FORM

Teachers' Self-Efficacy and Augmentative and Alternative Communication Technology Use

Tamara Parks

Liberty University

School of Education

You are invited to be in a research study to investigate whether teachers' intentions to use augmentative and alternative communication (AAC) devices and perceptions of students who use them can be predicted by their reported self-efficacy. You are a possible participant if you have taught kindergarten through eighth grade in this district and have had students who have used AAC devices. Please read the following information and ask any questions you may have before agreeing to participate.

Tamara Parks, a doctoral candidate in the School of Education at Liberty University, is conducting this study.

**Background Information:** The purpose of this study is to gather data related to whether teachers' attitudes can predict how they are using augmentative and alternative communication devices with students in the classroom and their perceptions of students with complex communication needs.

**Procedures:** If you agree to be in this study, I would ask you to do the following things: 1. Click "yes" to participate in the study and complete the survey provided at the link below.

**Risks:** The risks involved in this study are minimal, meaning they are equal to the risks you would encounter in everyday life.

**Benefits:** Participants should not expect to receive a direct benefit from taking part in this study. Potential benefits to society include increased teacher support and training to use augmentative and assistive communication devices and increased support for students with complex communication needs.

**Compensation:** Participants may be compensated for participating in this study. Participants completing the survey within the first two weeks will have the option to enter their email address

for the chance to win one of three \$50 Amazon gift cards. Email addresses will not be associated with responses to maintain anonymity.

**Confidentiality:** The records of this study will be kept private. Research records will be stored securely and only the researcher and her dissertation chair will have access to the records.

- Participant identity information will not be collected as part of the survey.
- Data will be stored on a password locked computer and may be used in future presentations and research. After three years, all electronic records will be deleted.

**Voluntary Nature of the Study:** Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to not answer any question or withdraw at any time, prior to submitting the survey, without affecting those relationships.

**How to Withdraw from the Study:** If you choose to withdraw from the study, please exit the survey and close your internet browser. Your responses will not be recorded or included in the study.

**Contacts and Questions:** The research conducting this study is Tamara Parks. You may ask any questions you have via email at [REDACTED] **You are encouraged** to contact the researcher if you have any questions before or after completing the survey. You may also contact the researcher's faculty chair, Dr. Laura Mansfield, at [REDACTED]

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA 24515 or email, [REDACTED]

*Please notify the researcher if you would like a copy of this information for your records.*

**Statement of Consent:** I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

## APPENDIX F: Email to Potential Survey Participants

Dear Educator:

My name is Tamara Parks and I am doctoral student at Liberty University. I am writing to request your participation in the Teachers' Attitudinal Scale Toward AAC (Augmentative and Alternative Communication) survey, which is for both general education (including P.E. and related arts) and special/exceptional education teachers in [REDACTED] Schools.

The purpose of this study is to gather data related to whether teachers' attitudes can predict how they are using (or would use) AAC devices with students in the classroom and their perceptions of students with complex communication needs. You are a possible participant if you have taught kindergarten through eighth grade, in any capacity, and have worked with students who have used AAC for communication.

Participants completing the survey within the first two weeks will have the option to enter their email address for the chance to win one of three \$50 Amazon gift cards. Email addresses **will not** be associated with responses to maintain anonymity. Participants will remain anonymous and none of the responses will be connected to identifying information.

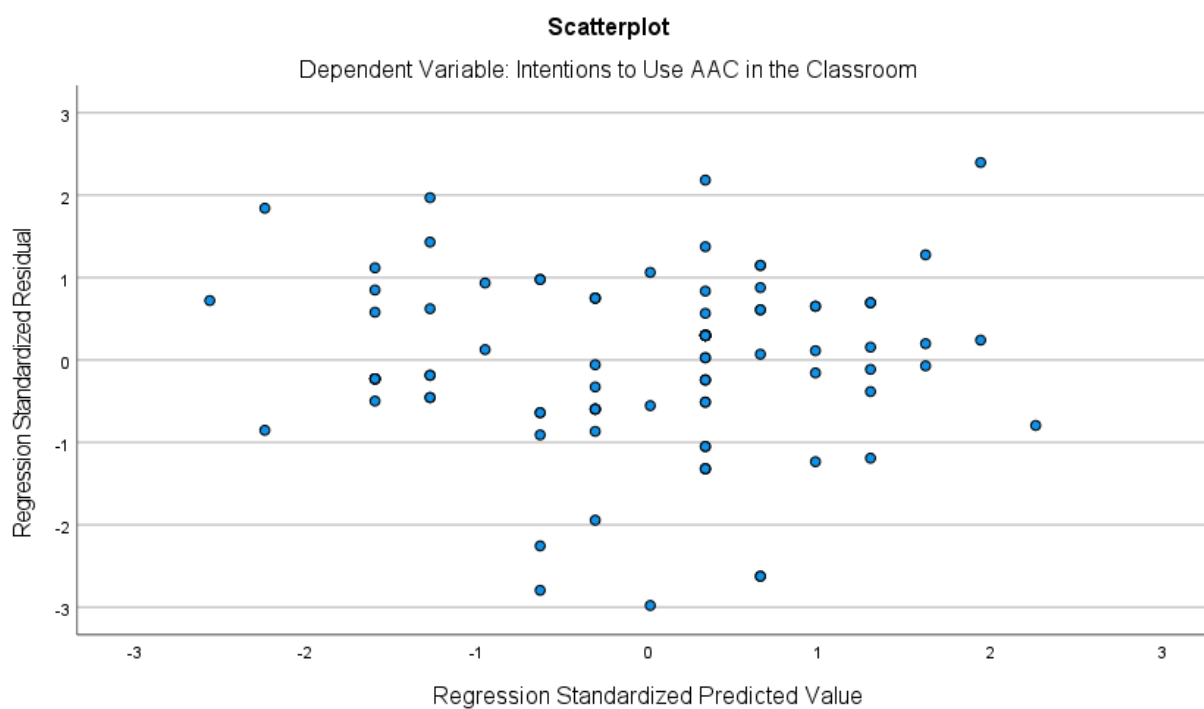
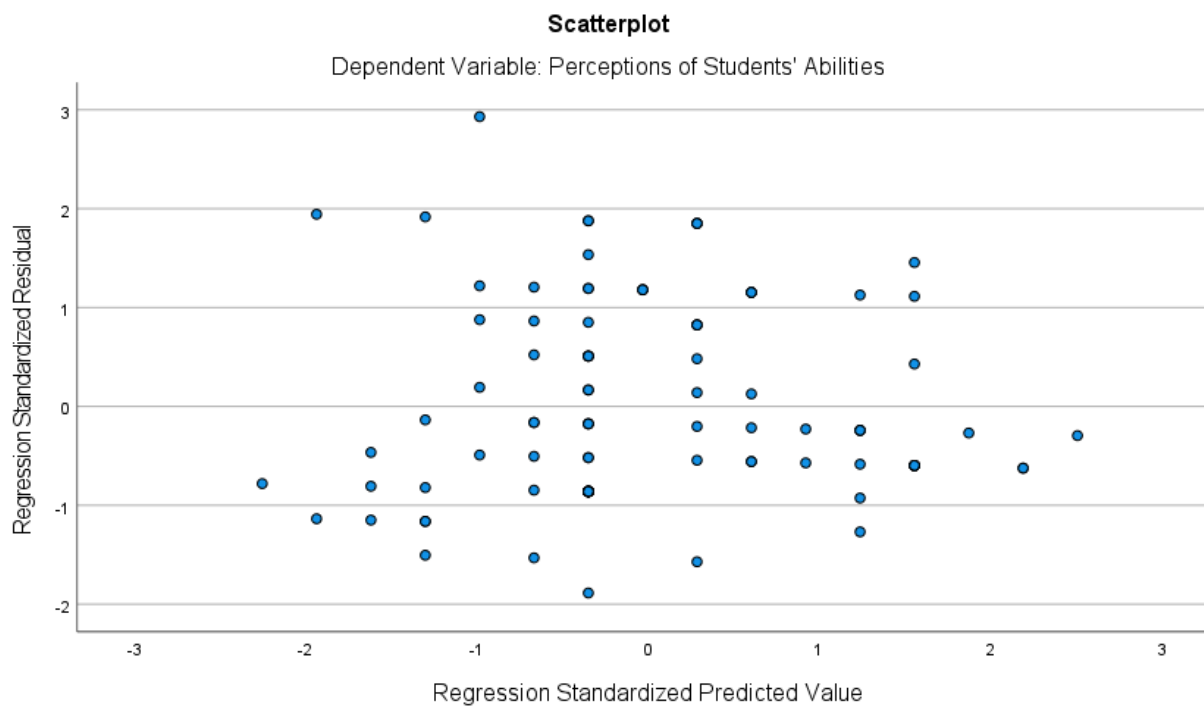
The survey will take approximately 10-12 minutes to complete.

To learn more and participate, please click on the following link: <link inserted here>

If you have any questions about this survey or experience difficulty in accessing the site, please contact Tamara Parks at [REDACTED]

Thank you in advance for your participation and feedback.

Sincerely,  
Tamara Parks

**APPENDIX G: Plots of Standardized Residuals versus Standardized Predicted Values**

## **APPENDIX H: Initial Email and Follow-Up Email to Administrators**

### **Initial Email**

Dear Administrator:

As a doctoral student in the School of Education at Liberty University, I am conducting research as part of the requirements for a Ph.D. degree. The title of my research study is Teachers' Self-Efficacy and Augmentative and Alternative Communication Use. The purpose of my research is to examine and determine whether teachers' intentions to use augmentative and alternative research devices and perceptions of their students' ability to communicate effectively can be predicted by their reported self-efficacy.

I am writing to request your permission to contact members of your teaching staff to invite them to participate in my research study.

Participants will be contacted via email and asked to click on the link provided to complete a Qualtrics survey. Participants will be presented with informed consent information prior to completing the survey. Taking part in this study is completely voluntary and participants are welcome to discontinue participation at any time. Additionally, participants will be entered into a drawing for one of three \$50 Amazon gift cards upon completion of the survey.

Thank you for considering my request. If you choose to grant permission, please respond by email to [REDACTED] at your earliest convenience.

Sincerely,  
Tamara Parks  
Doctoral Student  
School of Education  
Liberty University

### **Follow-Up**

Dear Administrator:

My name is Tamara Parks and I am a doctoral student in the School of Education at Liberty University. I am following up on an email that was sent on June 14, 2021, which provided information on the research study I am conducting as part of the requirements for a Ph.D. degree. I have received permission from the Accountability and Research Department of [REDACTED] to proceed. The title of my research study is Teachers' Self-Efficacy and Augmentative and Alternative Communication Use. The purpose of my research is to examine and determine whether teachers' intentions to use augmentative and alternative research devices and perceptions of their students' ability to communicate effectively can be predicted by their reported self-efficacy.

I am writing to request your permission to contact members of your teaching staff via email to



invite them to participate in my research study.

This study is open to all K-8th grade educators in Hamilton County Schools. Participants will be contacted via email and asked to click on the link provided or use the QR code to complete a Qualtrics survey. Participants will be presented with informed consent information prior to completing the survey. Taking part in this study is completely voluntary and participants are welcome to discontinue participation at any time. Additionally, participants will be entered into a drawing for one of three \$50 Amazon gift cards upon completion of the survey.

For your convenience, I am including a copy of the consent form as well as a flyer with information that can be shared.

Thank you for considering my request. If you have any questions, please respond by email to [REDACTED] at your earliest convenience.

Sincerely,

Tamara Parks

Doctoral Student

School of Education

Liberty University