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Parents' Attitudes and Beliefs About the iPad as a Tool for Augmentative and Alternative Communication

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Walden University
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Abstract

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Sarah Michele King

MPhil, Walden University, 2020

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Educators have increasingly incorporated technology tools such as the iPad into classroom learning. Available evidence suggests the potential efficacy of the iPad, but the attitudes and beliefs of parental stakeholders have often been omitted from empirical studies. There was a need to better understand parents' attitudes about adoption of the iPad and its apps as a tool for augmentative and alternative communication (AAC) for high school students and parents' beliefs regarding the iPad's ease of use for meeting students' communication needs. The purpose of this generic qualitative study was to examine those parental attitudes and beliefs. The conceptual framework was the technology acceptance model. The two research questions focused on parents' attitudes toward the adoption of the iPad and its apps and their beliefs about its ease of use. A purposive sample of eight parents of high school students with communication needs participated in semistructured interviews. Data were open coded to determine significant statements and then grouped into themes. The six themes related to adoption of the iPad were parents' belief that it is empowering, concerns for other children, the iPad's usefulness, other iPad uses, and pros and cons of using the iPad. The three themes related to ease of use were ease of use, required support from others, and iPad versus other devices. Findings reinforce that educators should tailor the iPad and its apps as an AAC to appeal to students' parents, who are significant contributors to their student's communication needs. Doing so may help improve the learning conditions for students enrolled in speech-language special education classrooms who have speech impairments of differing severity and type.

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Dedication

Delight yourself in the Lord, and He will give you the desires of your heart.

--Psalm 37:4

My heart's desire was to be educated, and I only desired a master's degree, but the Lord had other plans. He set me on an 8-year journey that led me to complete my PhD. I dedicate this PhD to Jesus because he gave me the desire of my heart.

To my daughter, Sarah Faith, your wisdom at a young age allowed you to understand that completing my PhD was instrumental for me to create a legacy for you and all who follow in our family. This has opened the door for us to break our family curse of being uneducated. Walk through the door with me, and soar!

To my brother, Mike and my father, Clay, you left this world before I could finish it. Mike, you always said you would never call me doctor, and you didn't, but I made it anyway. Dad, I did it! You knew you wouldn't be around when I finished it, so you called me Doctor before you left me. I love you!

To my mom, Phyllis, you instilled in me the value of an education when I was young, and your words didn't fall on infertile land; you helped me sow this desire for an education. Your encouragement kept me going when I hit the low spots and wanted to walk away.

To my sister, Teri, although you didn't quite understand the entire scope of working on a PhD, you provided guidance and support the entire time I traveled through this journey. Your prayers and love always lifted me up and helped me to find the strength I needed to finish.

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Lastly, thank you, Dr. Foshay, for being my dissertation chair and mentoring me through the countless revisions. You helped me see the light at the end of the long tunnel I entered when I began writing my dissertation. You are the perfect example of what an educator should be: dedicated and committed to successfully educating your students. Thank you for imparting your wisdom and knowledge to me, which kept me from sinking and abandoning this program; it allowed me to walk out the other end of the tunnel to complete the PhD journey.

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Chapter 1: Introduction to the Study

Educators have a responsibility to ensure that all students reach their full communication potential. This includes students who have communication needs, no matter the severity, because this is their fundamental human right (Binger et al., 2017). Educators have adopted technology into the classroom to improve learning and communication, and this has created a powerful union between technology and education for teaching students of the 21st-century (Tallvid et al., 2015). Yet, educational researchers overlook a plethora of rich and vital data when they omit the parent stakeholder groups—the group that is most influential with a child learning to speak—from research (Aram et al., 2013; Chow et al., 2017; Hwang et al., 2020; Mancilla-Martinez et al., 2020; Umek et al., 2005; Weigel et al., 2006). Because most high school students live with their parents, it would be beneficial to gain a better understanding regarding this stakeholder group's attitudes towards the adoption of the iPad and its apps being used as an augmentative and alternative communication (AAC) tool and their beliefs regarding its ease of use.

Tönsing et al. (2019) asserted that individuals who rely on AAC are "at risk of powerlessness because of their use of less conventional methods of communication, limiting access to different natural languages may be a further act of exclusion" (p. 2). Advancements in technology have affected every facet of education, including students using technology tools as an AAC for their communication needs. The iPad is one of the most recent technologies to expand into the classroom; however, there is a need for studies to determine the attitudes of parents regarding implementation and their beliefs

about the ease of use while their student uses tablets such as the iPad and its apps as an AAC for their communication needs (Auquilla & Urgil ès, 2017). Northrop and Killeen (2013) claimed that iPad usage in educational realms had generated numerous occasions to assimilate technology tools into language skill development. Auquilla and Urgil ès (2017) and Northrop and Killeen (2013) claimed that the iPad and its apps are used within education, and it can enhance student learning. Furthermore, Auquilla and Urgil ès (2017) and Northrop and Killeen (2013) claimed there is a need to learn about the attitudes and beliefs of the stakeholders such as parents regarding the iPad and its apps being used in the home because much language (both first and second language) learning occurs.

Moreover, Auquilla and Urgil ès (2017) argued that implementing technology into the classroom is becoming more widespread, and educators are modifying their lessons to include the iPad. Yet, the attitudes and beliefs from stakeholder groups of parents' regarding their high school students who have communication needs using tablet technologies such as the iPad and its apps as an AAC have limited empirical studies available since most language learning occurs outside the classroom (Kaufman, 2004; Vygotsky, 1978). Latta's (2019) study supported the argument that most language learning occurs outside the classroom by stating the participants within this study claimed that the "specific social supports (friends, family members, and teachers)" were significant in their language learning process (p. 68). Furthermore, Pappas' (2013) stated that parents could use the iPad and its Apps outside the classroom to assist their students' language learning. However, Pappas claimed that to use the apps appropriately, parents

need to possess some English knowledge, and this use would provide chances to practice the English language with their children.

In Chapter 1, I provide an overview of the study. The chapter begins with the background of the study and the problem statement, both of which reinforce the need for the study. The purpose of the study and the research questions (RQs) that informed the study's design follow. Chapter 1 also includes sections on the nature of the study, the conceptual framework, definitions, assumptions, scope and delimitations, limitations, and the significance of the study. The chapter summary serves as a segue to Chapter 2.

Background

Although the iPad has only been on the market since 2010, many educators from all over the world view it as an excellent piece of technology that supports students who have communication needs. However, there is a lack of research to support these assertions (Binger et al., 2016; Sullivan & Bhattacharya, 2017; Xin & Leonard, 2015; Zieni, 2019). In addition, there is limited empirical evidence on parents' attitudes regarding the adoption and ease of use of the iPad and its apps as an AAC for high school students who have communication needs. The iPad was rapidly implemented into the business sector (Evans, 2018), and educators soon began to implement the iPad into their classrooms. Educators soon asserted that the iPad positively affected students' communication skills and changed their communication behaviors (Gallagher et al., 2015). For example, Ou-Yang and Wu (2017) argued that technologies such as the iPad are the future for students' communication needs because mobile technologies combine "cutting-edge technologies with traditional educational approaches" that help address the

modern learner's communication needs (p. 1045). In exploring the usefulness of the iPad, Jenson and Muehrer (2013) claimed that there was a lot of "hype" regarding the device's potential usage in schools (p. 244). Additionally, the researchers claimed that educators from throughout the United States were purchasing iPads at a "rapid rate" (p. 244) to use in their classrooms to help with student learning.

However, there is little empirical evidence to support the claims that the iPad is an easy-to-use educational tool outside the classroom from stakeholders such as the parents. Jenson and Muehrer (2013) contended that iPads are being used in classrooms throughout the United States. Researchers such as Torres et al. (2015) argued that there is a strong, positive relationship between academic improvement and the use of technology, along with the use of technology showing improvements with students' cognitive processing and memory skills. Devlin and McKay (2016) and Islam and Anderson (2015) maintained that there is an increasing need to examine and understand the views of other stakeholders, such as parents.

Stacy and Aguilar (2018) observed that educational stakeholders wanted to understand the ease of use of mobile technology tools in education and that more research is needed to show its usefulness because of the increased usage. Murdock et al. (2013) noted few empirical studies regarding the use of the iPad as a tool for students who have communication needs. The researchers claimed that the iPad is being used in the classroom environments, and that empirical studies regarding the iPad's use within education are only now starting to appear. Jenson and Muehrer (2013), Murdock et al. (2013), Ou-Yang and Wu (2017), and Auquilla and Urgil ès (2017) support research to

determine the attitudes of parents regarding the implementation and ease of use of the iPad. Researchers in many fields have declared that there is a need for more research regarding students' use of technology such as the iPad to assist with their communication needs because some empirical data are showing positive associations between the use of this technology and language learning among students (Alzrayer et al., 2014; Clark et al., 2014; Cong et al., 2015; D'Agostino et al., 2016; Devlin & McKay, 2016; Hu et al., 2016; Islam & Anderson, 2015; Jiang, 2017; Krivoruchko et al., 2015; Lara-Alecio et al., 2018; Lorah & Parnell, 2017; Mallet et al., 2016; Özen, 2015; Payne & Stine-Morrow, 2017; Pennington et al., 2019; Pinto & Gardner, 2014; Stacy & Aguilar, 2018; Sun et al., 2016, 2018; Thiemann-Bourque et al., 2019; Tönsing, 2016; Waddington et al., 2017; Xin & Leonard, 2015).

As the literature indicates, there is empirical evidence supporting the iPad's positive effects when students use it to assist with their communication needs. However, there is a lack of empirical evidence regarding parents' attitudes regarding the adoption and ease of use of the iPad and its apps to meet their student's communication needs. Research is needed to gain a deeper understanding regarding parents' attitudes towards the adoption of the iPad as an AAC and their beliefs regarding the technology's ease of use for their children. This is because parents are the most influential stakeholder regarding their children's learning needs (Wood & Su, 2019).

Problem Statement

The problem is a need to better understand the attitudes toward adoption and the beliefs about ease of use parents have toward the iPad and its apps as an AAC device for

their children's communication needs. This understanding is key to the adoption at scale of iPads for AAC in homes. Although available evidence suggests this application's potential efficacy (Alzrayer et al., 2014; Clark et al., 2014; Cong et al., 2015; D'Agostino et al., 2016; Devlin & McKay, 2016; Hu et al., 2016; Islam & Anderson, 2015; Jiang, 2017; Krivoruchko et al., 2015; Lara-Alecio et al., 2018; Lorah & Parnell, 2017; Mallet et al., 2016; Özen, 2015; Payne & Stine-Morrow, 2017; Pennington et al., 2019; Pinto & Gardner, 2014; Stacy & Aguilar, 2018; Sun et al., 2016, 2018; Thiemann-Bourque et al., 2019; Tönsing, 2016; Waddington et al., 2017; Xin & Leonard, 2015), there are inadequate empirical studies regarding the critical aspects of adopting the application at scale, such as attitudes and beliefs of the parent stakeholder group regarding their child's use of technology to meet communication needs. Despite the inadequacy of available research, educational systems throughout the United States have invested in iPads and adopted tablet technology programs for communication needs for student use at school and home (Alzrayer et al., 2014; Islam & Anderson, 2015; Lara-Alecio et al., 2018; Pennington et al., 2019; Stacy & Aguilar, 2018; Thiemann-Bourque et al., 2019; Xin & Leonard, 2015). This level of investment reinforces the need for more research to understand the attitudes and beliefs of all stakeholders associated with the programs (Crook et al., 2015; Henderson et al., 2017; Robinson, 2016).

Purpose of the Study

The purpose of this generic qualitative study was to examine parents' attitudes regarding the adoption and ease of use of the iPad and its apps as an AAC by high school students with communication needs. This study provides insight into parents' attitudes

and beliefs about the iPad's usefulness as an AAC for their children. Additionally, it clarifies parents' beliefs regarding the iPad's ease of use as an AAC for their child's communication needs.

Research Questions

The RQs for this study were as follows:

RQ1. What are parents' attitudes about the perceived usefulness of the iPad as an AAC for high school students with communication needs?

RQ2. What are parents' beliefs about the ease of use of the iPad and its apps as an AAC for high school students with communication needs?

Conceptual Framework

The most influential theory to understand how and why technology is being adopted and used is the technology acceptance model (TAM). Davis (1985) conceived the TAM model while a doctoral candidate at Michigan Institute of Technology. The TAM was designed to help determine the stakeholder's attitudes about adopting and ease of use of technology, which makes it pertinent to studying the iPad and its apps. A more detailed explanation of the theory is in Chapter 2. Davis et al. (1989) described the TAM as defining how individual users of a particular technology determine the relationship between what they believe as the real usefulness of it and how easy they find it is to use.

Although the TAM is highly subjective, with propositions that fluctuate from user to user, Davis et al. (1989) argued that individuals who define their beliefs about the usefulness of the technology and ease of use are the reason for the technology's success or lack of acceptance. Additionally, Chuttur (2009) argued that perceived usefulness and

ease of use are of utmost importance and are influenced by external variables such as social and cultural factors. Likewise, some researchers have used the TAM to explain how some cultures have adopted technology, while other researchers have used it to describe others' attitudes about the technology and determine their acceptance levels regarding it (Huntington & Worrell, 2013; Zhao et al., 2018). Thus, the TAM could be vital because it might provide insight into understanding different cultural issues of parents of students adopting technology such as the iPad and its apps as AACs into their homes. Bagozzi et al. (1992) argued that attitudes, beliefs, and intentions are significant influences in implementing technologies such as tablets and computers in teaching and learning, and it is important that the implementation process is better understood. Additionally, Bagozzi et al. argued that attitudes are important determinants of the adoption of computer technology. The use of the TAM as the conceptual framework for this study was appropriate because the focus of the study was on determining the attitudes and beliefs of parents about their children's adoption of the iPad and its apps (Bagozzi et al., 1992; Davis et al., 1989; Huntington & Worrell, 2013; Zhao et al., 2018).

Nature of the Study

In this generic qualitative study, I sought a deeper understanding of parents' attitudes about the iPad and its apps as an AAC and their beliefs about the iPad's ease of use for high school students with communication needs. I conducted interviews with eight parents. The participants were parents of students in Grades 9-12 who used the iPad and its apps as an AAC for their communication needs due to communication deficiencies. I used purposive sampling to select participants to ensure that they met the

specific inclusion criteria. Participants were solicited in accordance with Walden's Institutional Review Board (IRB) guidelines. Solicitation letters were sent to 21 local high schools within the San Antonio, and Austin, Texas, metropolitan areas, and a recruitment flyer were posted on group pages of the social media platform Facebook. Posting the flyer on Facebook pages allowed for the identification and recruitment of participants across the continental United States.

Definitions

To ensure clarity, I define certain words and phrases as they are used within the context of this study:

Adoption: The choice made by a person or group of individuals to fully implement or use a piece of technology (Rogers, 2003).

Attitudes: The overall judgment or assessment of a person, group of people or a cultural hold regarding objects, other people, problems, or concerns (Albarracin & Shavitt, 2018).

Augmentative and alternative communication (*AAC*): Any tool or piece of equipment used by individuals to help communicate their thoughts, ideas, needs, or wants (American Speech-Language & Hearing Association, 2021).

Beliefs: Defined as an individual's negative or positive feelings, thoughts, and/or ideas regarding the perceived usefulness of technology (Davis et al., 1989).

Communication needs: Any deficiency, mild to severe, that prohibits or prevents an individual from understanding and/or expressing their "needs, wants, feelings, and preferences" (American Speech-Language-Hearing Association, 2021, Definition of

Communication: Bottom line) or transferring information and ideas, and requires the use of an AAC device to assist them with modified “movements, gestures, objects, vocalizations, verbalizations, signs, pictures, symbols, printed words” (Definition of Communication). Communication needs could include lisps, hearing disorders, autism spectrum disorder, impaired articulation, a language impairment, voice impairment, and stuttering (IDEA, 2004).

Language learners (LLs): Students who have limited language skills, either oral or written, and are currently learning to speak (Gollnick & Chinn, 2017).

Parents: Individuals, including caregivers, other family members, and adoptive persons, who provide daily care, such as food, clothing, and shelter, to children (Cardon et al., 2015).

Assumptions

Assumptions are beliefs that are not examined; however, they encompass the basic beliefs that people hold about the world (Neuman, 2003). Furthermore, Bendersky and McGinn (2009) asserted that assumptions play an important role in research because they relate to the fundamental characteristics of a phenomenon that is being studied and the setting in which it occurs. Citing Davis and Marquis (2005), they stated that "barriers to knowledge sharing between subfields and the broader field may arise from different assumptions about the problems under investigation" (p. 2). I was mindful of my assumptions in conducting this study to ensure the study was considered credible.

There were four assumptions associated with this study. The first assumption for this study was that all participants would answer the interview questions in an honest and

straightforward manner. I informed the participants that they would receive a small token of appreciation for participating in the study. To ensure honest and straightforward answers, I offered no rewards for the answers given. Additionally, participants remained anonymous throughout the study and after publication, and they had the ability to withdraw from the study at any time. The second assumption was that all participants were parents of ninth- and 10-grade students. This assumption was based on the purposive sample inclusion criteria that ensured the participants had knowledge and experience related to their child using the iPad as an AAC. The third assumption was that all participants were sincerely interested in participating in the research, had no other motives, and were not influenced by any other factors. I based this assumption on a belief that parents care about and have genuine concern regarding their child's language development.

Scope and Delimitations

In this study, I examined parents' attitudes and beliefs about the implementation and ease of use of the iPad and its apps for their students in Grades 9 through 12. I did not examine speech-language impairments. Furthermore, I did not account for any other stakeholder group; I interviewed a small sample of parent stakeholders, whose attitudes, beliefs, and experiences might not be reflective of other stakeholders. This study was not a study of the efficacy of iPads for AAC; I sought to answer RQs regarding the attitudes parents had about the perceived usefulness and ease of use of the iPad and its apps as an AAC for students.

Limitations

Creswell (2003) described the limitations of a qualitative study as being one of generalizability. Additionally, Yin (2018) noted that it is difficult to generalize the findings of a qualitative to larger populations because the investigation is limited to a particular small population. For this study, only a small number of parents were interviewed, making their attitudes and beliefs unique to this study. The small sample size did not allow for generalization to other parents outside of the study school or outside of the particular grades within this school that were included in the study. However, the information from the study could be useful to other stakeholders who are considering using the iPad in similar language learning situations, which could allow for minimal generalization.

A second possible limitation of this study concerns transferability. The ability to generalize study findings may rest upon its potential for transferability (Carminati, 2018). Elo et al. (2014) argued that a qualitative study's transferability might not occur if the reader cannot connect the findings of a study to their particular need. To ensure that this study has transferability, I provide a detailed discussion regarding the participants' attitudes and beliefs about the iPad being used as an AAC by their child who has speech-language impairments (see Moser & Korstjens, 2018).

Also, the study's potential impact may rest upon the dependability of the study design. Elo et al. (2014) maintained that dependability in qualitative studies is a concern that must be addressed by the researcher of the study. Dependability could be an issue because the study might not be able to be replicated by others in the future due to the

limited information regarding participants. To overcome dependability issues, I clearly describe the participants in the narrative to follow.

A fourth limitation of this study involved the potential for interview responses to be one-sided or inaccurate because of personal bias because parents have a personal stake in their students' education (see Patton, 2015). Moreover, Patton (2002) claimed that interviews could cause emotional changes to occur in both the interviewer and the interviewee. To alleviate this potential limitation, I examined the value of the potential responses against the stress it could have caused the participants and allowed the individual participants to decide if they wanted to respond or not. I let participants decide how much to reveal and provided them the option to remove their responses at any time following their interview (see Patton, 2015).

A fifth limitation pertained to the accuracy of interview responses. First, interviewees may have memory recall problems, and the presence of an interviewer could cause the interviewee to behave in different ways than they might otherwise act. Second, as Yin (2018) discussed, there is a potential for bias from poorly developed questions. To mitigate this risk, I ensured that the questions were fully developed by pretesting them.

Significance

More than 7.5 million people in the United States have some type of communication need. This number includes many students whose needs are being overlooked because the tools available to them do not meet their communication needs (Binger et al., 2016; Casilio et al., 2019; Devlin & McKay, 2016; National Institute of Deafness and Other Communication Disorders, 2016; Pham & Tipton, 2018; Sun et al.,

2018; U.S. Department of Education, National Center for Education Statistics, Common Core of Data, 2015). This study's results may help parents better understand the impact of implementing the iPad into their student communication needs for everyday practices, which could help increase students' learning abilities and skills (Binger et al., 2017). By understanding the parent stakeholders' attitudes and beliefs, educators might be able to better tailor the iPad and its apps as an AAC to appeal to the students' parents, who are significant influences on their student's communication (Alzrayer et al., 2014; Islam & Anderson, 2015; Lara-Alecio et al., 2018; Pennington et al., 2019; Stacy & Aguilar, 2018; Thiemann-Bourque et al., 2019; Xin & Leonard, 2015). The study results may provide information about how the parent stakeholders' attitudes and beliefs affect the adoption of the iPad used as an AAC tool for communication needs. Furthermore, this study may offer a foundation for other research on implementing the iPad into other education areas. This study could help the efforts of educators within the field of speech and language pathology, who seek to help students of all ages obtain more profound communication skills.

Information from this study might provide ideas that may help improve the learning conditions for students enrolled in speech-language special education classrooms who have speech impairments that range from mild to severe. The study findings could be applicable to students with all types of speech impairments, including English Language Learners. This study could shed light on how the iPad might provide students with an electronic voice and enhance their communication skills.

Significance to Practice

This study's results may provide a deeper understanding of the impact of parents deciding to implement the iPad as an AAC for their child who has communication needs. Additionally, this study's results might offer insight from the parents' perspective regarding how they approach their child's communication needs. Furthermore, the study could provide educators with a better understanding of this stakeholder group's attitudes about the adoption of the iPad and its apps and why they like or dislike the technology. Educators may be able to use this knowledge to enhance children's learning opportunities and increase their communication skills and learning abilities. Additionally, the findings of this study might provide some insight into factors that prevent parents from using iPad technology at home for their child's language learning needs. With this knowledge, educators may be better able to identify training needs and opportunities. The findings of this study may offer a foundation upon which other research for implementing the iPad can be developed. This study may further improve educators' educational efforts within the speech-language classroom to help students obtain more profound communication skills.

Significance to Social Change

This study might make contribute to research on tablet technology as a communication tool for students who have communications needs. Researchers might, for instance, transform a technology gadget that some parents use as a toy or a portable radio and television into an electronic voice for some students who have communication needs. Insights from the study on parental attitudes and beliefs about the iPad and its apps

as an AAC tool for their children's communication needs might clarify ways to improve student communication skills.

Summary

In Chapter 1, I introduced the study and explained the problem, which is the lack of research available regarding parents' attitudes about adoption of the iPad and its apps as an AAC for their high school students and their beliefs about the ease of use of the technology to meet students' communication needs. Although many educators contend that students' communication skills are improving with the use of the iPad, there is not much research available regarding the perceptions of the parental stakeholder groups' attitudes towards the adoption of the iPad and its apps and their beliefs regarding its ease of use for students to meet their communication needs (Binger et al., 2016; Sullivan & Bhattacharya, 2017; Xin & Leonard, 2015; Zieni, 2019). Chapter 1 also includes discussion of the assumptions, scope and delimitations, limitations, and potential significance of the study. The key terms used in this study were also defined. I also stated the study's purpose and provided an overview of the conceptual framework and nature of the study.

Chapter 2 includes more discussion of the study's conceptual framework as well as a review of key literature on student performance while using the iPad as a learning tool and traditional language learning tools compared to non-traditional communication tools. In Chapter 3, I discuss the rationale for the research method and design, my role as the researcher, and the methodology that I used to answer the RQs. Chapter 3 also includes details on the participant pool and the methods used to collect and analyze the

data. I also discuss trustworthiness issues, including credibility, transferability, dependability, confirmability, and ethical procedures.

Chapter 2: Literature Review

Introduction

Leaders of educational systems are increasingly adopting technology to address student communication needs (Bent et al., 2019; Islam & Anderson, 2015; Nelson et al., 2016). Researchers in many fields of study have called for more investigations regarding the use of tablets in classrooms for student communication needs. According to McKnight et al. (2016) and Xin and Leonard (2015), educators are anecdotally claiming that technology tools such as the iPad have a positive impact on students with communication needs. However, various stakeholder groups inside and outside the classroom have countered this perspective. Opposition to using devices for communication needs is found in Whalen et al. (2006), who claimed that the use of technology might impede children with autism spectrum disorder (ASD) because the skills learned from using technology may not be transferable to other activities. Additionally, Parsons et al. (2019) claimed that technology might contribute to students limiting their social interactions with parents, peers, teachers, and therapists.

Considering these diverse perspectives is necessary to fully understand whether the adoption of technology helps children with communication needs. According to Lunenberg et al. (2007), the main focus of empirical studies regarding communication tools being used by students with communication needs has been on the attitudes, opinions, and beliefs of educators, administrators, and student stakeholder groups. As far back as 1929, Dewey argued that teachers needed to research “the impact of their own actions” (Lunenberg et al., 2007, p. 13). In contrast, Buchanan et al. (2013) argued that

barriers to adopting technologies and self-efficacy had been the main focus of empirical studies. However, according to Bate et al. (2013), there are few studies available on the perspectives of parental stakeholder groups and understanding their "uncertainties and anxieties could be critical" (p. 18) to the successful implementation of technology in education. Bate noted that primary focus of researchers had been on the opinions, attitudes, and beliefs of educators, which has created a gap in research, with the perspectives of stakeholder groups such as parents not adequately examined. This gap in research defined the purpose of this study, which was to examine parents' attitudes and beliefs regarding the adoption and ease of use of tablet technology such as iPads for high school students who have communication needs.

In conducting this research, I sought to provide more understanding of the parent stakeholder group's attitudes and beliefs regarding the adoption and ease of use of the iPad and its apps as an AAC by their student. There are several empirical studies on technology adoption that include the perspectives of educators and students in different educational settings (e.g., Hill & Flores, 2014; Islam & Anderson, 2015; King et al., 2014; McKnight et al., 2016; Nelson et al., 2016; Pham & Tipton, 2018; Sun et al., 2018). In conducting this study, I wanted to contribute a different perspective, that of parents, to this research. In this chapter, I review literature supporting the need for this investigation. After discussing the literature search strategy, I discuss the study's conceptual framework, TAM, and its relevance to this investigation. In the literature review that follows, I discuss the use of the iPad as an ACC and traditional devices versus nontraditional devices.

Literature Search Strategy

Most of the studies included in the literature review were published from 2010 to 2019. The discussion of literature includes older and newer literature to show that since the market release of the iPad in 2010, educators have implemented the iPad and its apps as an AAC in language learning. The older literature provides a rich historical foundation that shows that early investigators explored the usefulness of the iPad and its apps inside and outside the classroom. However, the literature results are mixed, and most researchers have discussed the limitations found within their studies, with all agreeing that more studies are needed. The existing research focuses on using the iPad as a learning device within a variety of classrooms, including some that focus on speech-language communication devices. However, none of the studies focus on parents' attitudes regarding the adoption of and beliefs about the ease of use of the iPad and its apps as an AAC for student language learning.

I used several different resources to discover research for the review. They included the databases ProQuest Central, Sage Research Methods, and ERIC, which I accessed from Walden University Library. I also used Google Books, Amazon Prime, Research Gate, and Google Scholar to find literature. All studies were from peer-reviewed journals. The research related to iPads being used in speech-language classrooms, including English as a Second Language classrooms, and iPads for speech-communication learning in special education classrooms. Keywords used for the search included *case study*, *phenomenological*, *research*, *iPad*, *tablet*, *education*, *autism*, *speech*, *language*, *mobile technology*, *parent*, *caregiver*, *educator*, *psycholinguistics*, *teacher*,

traditional teaching methods, *alternative assistive technology*, and *speech-generating devices*.

Conceptual Framework

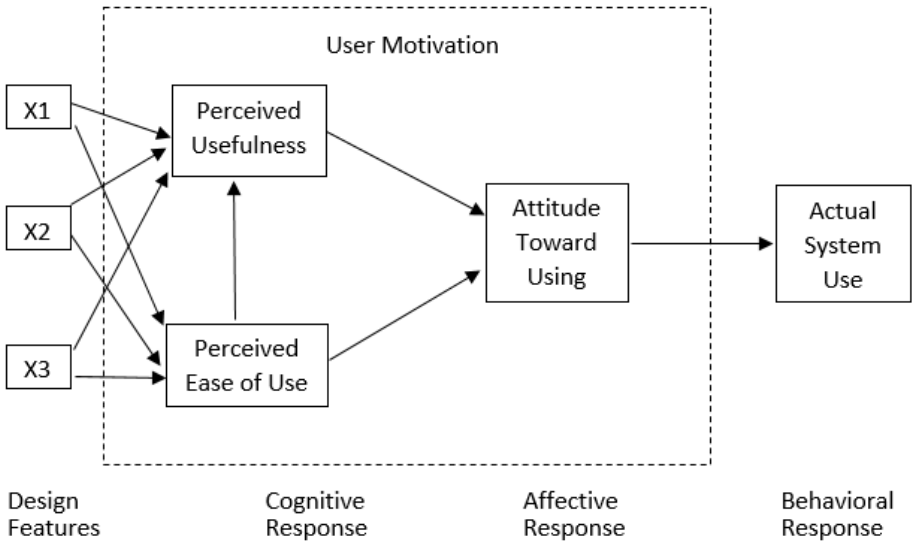
Prior researchers used a variety of conceptual frameworks, including Connectivism and the theory of multimedia learning. Examination of these options supported the selection of the TAM as the best choice for this study. Siemens (2005) defined connectivism as learning that occurs while using technology when connecting new sets of information to previous known information that enable the learner to obtain new and important learning. The new information that is acquired allows the learner to distinguish between important and unimportant information. The new important information chosen by the learner alters their prior knowledge. This theory is relevant; however, it did not fit this study's parameters, which involved seeking answers about how parents perceive how learning might be affected by using the iPad.

Another theory that was closely related to this research and that I considered was the theory of multimedia learning by Richard Mayer. Mayer (2009) defined the theory of multimedia learning as the "multimedia principle" that "people learn more deeply from words and pictures than from words alone" (p. 47). Mayer stated that the brain transfers this information in an organized manner that allows the learner to produce mental constructs that integrate new learning onto prior knowledge. However, I did not focus on how students are learning; instead, I strove to understand what parents' attitudes and beliefs are regarding the adoption and ease of use of the iPad and its apps as an AAC for student language learning.

I concluded that TAM provided an appropriate conceptual framework for the study. Davis (1985) developed TAM while a doctoral candidate at the Michigan Institute of Technology. In 1989, Davis et al. defined the TAM as the relationship between users' beliefs regarding the usefulness of a technology and its ease of use (see Figure 1). Key concepts of the TAM include apparent usefulness, ease of use, and user acceptance.

Figure 1

Technology Acceptance Model



Note. From *A Technology Acceptance Model for Empirically Testing New End-User Information Systems: Theory and Results* (p. 24), by F. D. Davis, 1985, Massachusetts Institute of Technology (https://dspace.mit.edu/handle/1721.1/15192). Copyright 1985 Massachusetts Institute of Technology. Reprinted with permission of the author (see Appendix A).

Davis (1985) claimed that the TAM is fluid because it changes from user to user. Users' assertions regarding their reasons for adopting and using the technology are based

upon how they perceive its ease of use and usefulness, which contributes to the success or failure of technology within various populations. Davis' argument is supported by subsequent researchers who have used the TAM in their investigations. Dziak (2017), Granic and Marangunic (2019), Huntington and Worrell (2013), Joo et al. (2018), Katebi et al. (2022), Pal and Vanijja (2020), Scherer et al. (2019) and Zhao et al. (2018) argued that the TAM could be used to explain why individuals in some cultures adopt certain technologies and why others reject it. Additionally, Appiah et al. (2021), Chang et al. (2017), Dziak (2017), Shanmugavel and Micheal (2022), and Tractinsky (2018) observed that the TAM is mainly used to explain why individuals use new technology over other technologies. Based on this research, I determined that the TAM was appropriate for exploring parents' embrace of technology such as the iPad and its apps for their children.

Buchanan et al. (2013), Man et al. (2021), Oyman et al. (2022), Rahami et al. (2018), and Suleman et al. (2021) argued that although the original TAM has several additions to it since its original conception, it is widely used and is popular, but it does have some critics. One critic is Bagozzi (2007), who credits the TAM for its "parsimony," but it is also its "Achilles' heel" because this one theory cannot explain "decisions and behaviors" in-depth as it encompasses several types of "technologies, adoption situations, and differences in decision making and decision-makers" (p. 244). In addition, Bagozzi contends that even though several have tried to expand the definition of the TAM, none have "deepened" it because they could not explain the perceived usefulness (PU) and perceived ease of use (PEU) (p. 244). Bagozzi argues that the TAM has "large gaps," and it is "conceptually impoverished" because not much abstract data

can describe “the why” of the TAM (p. 244). Akin to Bagozzi's criticism, Benbasat and Barki (2007) asserted there is one significant unplanned issue in trusting the use of the TAM. This trust issue is described by Benbasat & Barki as researchers wearing “blinders” because they shift their emphasis from researching the “design” and implementation-based background to the consequences of technology adoption and acceptance (p. 212). The reviewers indicated that this causes researchers to overlook what makes technology useful and focuses on the importance of PU and PEOU. Benbasat & Barki contend the TAM focus is “middle-range theory” that offers a connection to technology within the 21st century because of the power the TAM carries, and it has not “served the IT adoption research community well” (p. 216). Additional criticism of the TAM is also found in Hai and Alam Kazmi’s (2015) study. The researchers claimed the TAM is not robust enough to explain why people accept or reject technology. Furthermore, Ajibade (2018) argues that some users are obligated to use technology, such as technology offered by a school or business, and the TAM cannot truly predict why users adopt and use the technology. Although Ajibade (2018), Hai and Alam Kazmi (2015), Bagozzi (2007), and Benbasat and Barki (2007) have criticisms of the TAM, Buchanan et al. (2013), Budu et al. (2018), Djimesah et al. (2021), and Tsai et al. (2017) emphasizes that understanding adopters’ attitudes and behaviors that lead to the adoption of technology through the use of the TAM provide deep insight into technology acceptance.

The original TAM (Davis, 1985) is the focus of the conceptual framework because it defines the stakeholders’ attitude towards the adoption of technology and the

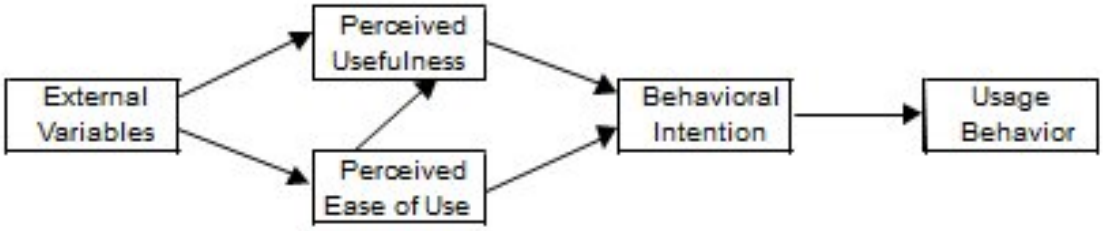
perceived ease of use. In addition, Diop et al. (2019) argue that the TAM is a “simple and robust framework” and is “widely” accepted because it explains why users accept technology (p. 17). Unlike the original TAM (Davis, 1985), the extension of the TAM is not relevant to this study because this study is not looking for usage intentions of the technology as defined in the TAM2 (Venkatesh & Davis, 2000). The extended version of the TAM, now known as the TAM2, describes the external factors that influence users’ attitudes and behavioral intention and the actual use of the technology. Sullivan (2016) argues the TAM2 pushes the intentions of the user to become less rigid, which causes the elements of perceived usefulness to evolve over time. In addition, the TAM2 incorporates the three social forms of a normal model that is subjective, uncoerced, and can be copied, and these elements can describe how easy it is to use, the amount that is produced and is relevant to the event (Sullivan, 2016), which do not fit into the purpose of this study, which is to examine parents’ attitudes regarding the perceived usefulness of the iPad and its apps as an AAC and their beliefs regarding the ease of use of the iPad and its apps as it is used as an AAC. A new extension of the original TAM is found in the proposed TAM3 developed by Venkatesh and Bala (2008). The researchers define the TAM3 as a combination of the TAM2 and the Perceived Ease of Use model's Determinants. According to Venkatesh and Bala, TAM3 described the relationships between "perceived ease of use and perceived usefulness;” “computer anxiety and perceived ease of use;” and “perceived ease of use and behavioral intention” (page 281). However, the TAM3 does not apply to this study because it does not seek to define the relationships between the perceived ease of use and perceived usefulness, computer anxiety and perceived ease of

use, or the perceived ease of use and behavioral intention. Venkatesh and Bala (2008) expanded the original TAM by developing a third extension named the Unified Theory of acceptance and use of technology (UTAUT). Venkatesh and Bala also claimed the UTAUT is a valuable instrument for measuring the probability of successful adoption of technology, and it can provide clarity into why users accept or refuse the adoption of technology, which eliminates this extension of the TAM from being used as the framework for this study.

Smeda et al. (2018) study utilized the TAM to understand the adoption of e-books used by 392 Libyan college math and stats students. The researchers examined the factors that impacted the adoption of e-books and that the TAM can "predict and explain" why technology is adopted by users (p. 241). The researchers divide the TAM factors into three categories, perceived usefulness (PU), which included self-efficacy and resistance to change; attitude (AU) and behavior intention (BI); and perceived ease of use (PEOU) correlating to the quality of library services, mobility, and facilities. The results showed the PU played a significant role in the adoption of the e-book, and the students' PEOU was directly related to the BI regarding the use of the technology. Figure 2 provides a diagram of how the TAM factors are related (Venkatesh & Davis, 1996).

Figure 2

Model of the Relationship Between the TAM Factors



Note. TAM = technology acceptance model. From "A Model of the Antecedents of Perceived Ease of Use: Development and Test," by V. Venkatesh and F. D. Davis, 1996, *Decision Sciences, 27*(3), p. 453. Copyright 1996 by American Institute for Decision Sciences. Reprinted with permission (see Appendix B).

Smeda et al. stated that the participants claimed that the e-books' ease of use contributed to their ability to study better. Additionally, the researchers proclaimed that "positive" attitudes contribute significantly to "positive" influences towards the use of technology, and the factors of TAM had a substantial effect on the approval and adoption of the e-books amid Libyan math and stats college students (p. 251).

Similar reactions to Smeda et al. are found in Bagozzi et al.'s (1992) study. The researchers claimed that attitudes are factors for adopting the technology and beliefs about technology, leading to the adoption in teaching and learning. Besides, Luijkx et al. (2015) claimed that children influence their parents with their decisions regarding the adoption of technology. When the adults see their children using technology such as the iPad and its apps, it prompts the adults to want to "own this kind of technology" (p.

15477). The adoption process must be examined to provide a better understanding of its adoption and use. In addition, Tsai et al.'s (2016) study had similar findings as Smeda et al. in that the results suggested that perceived ease of use of technology has definite advantages that influence the perceived usefulness and technologies' advantages embellish the ease of use.

Research conducted by the medical researchers using the TAM was accomplished in a two-year pilot study completed by Johnson and Howard (2019) that investigated the adoption of the iPad mini by nine third-year medical students enrolled in a seven-month rural internship. The researchers sought to determine if the iPad is preloaded with mobile health apps, would it improve users' experience, and increase their awareness of and access to free health information while enrolled in the study. The participants were asked to track their thoughts regarding the iPad mini's primary uses and convenience while using it to make diagnoses, to determine the appropriate medicines and doses, and study medical literature. The results showed "159 benefits and 70 challenges" were revealed by participants, with all participants claiming an "overall positive" experience that led to the director requesting a continuation of the study beyond the pilot (p. 37). However, the study showed that one participant stated they felt they were seen as "unprofessional" by patients when they used their iPad mini during patient examinations, so they would refrain from using it when patients were present.

In Johnson and Howard's (2019) study, the researchers claimed the study encountered "many" challenges and limitations, such as the adoption of "time-consuming" programs that required expert advice from IT people (p. 38). Another

essential challenge identified within the study was that the application's operating system was sometimes not compatible with the Apple software causing communication problems between the device and the in-place systems with the medical library. The TAM "instrument statements were placed into a Likert scale of 1 (extremely unlikely) to 7 (extremely likely)", which allowed the researchers to determine the results quantitatively (p. 39). The data showed there were positive attitudes, with an average of greater than five on the 7-point scale, concluding 159 positive results compared to the 70 challenges that were rated less than five, regarding the adoption of the iPad mini and the ease of use kept participants motivated. The researchers asserted that the participants emphasized using the iPad mini enhanced their experiences within the rural setting by providing the necessary data to treat patients appropriately. Johnson and Howard identified a few limitations to the study, including the small sample size and not having a control group in the study that could contribute to its limitation. Additionally, the researchers felt there might be some participant bias because they deemed the results for the TAM constructs statements were "too high to be deemed reliable, "and some statements were "too vague" and made it difficult to categorize, which resulted in these statements being placed in the "unknown/unable to recognize" category (p. 39). Moreover, the researcher made no mention of recommending future studies that could contribute to the significance of this study. However, Johnson and Howard's study is relevant to my research because they based their study upon the framework of the TAM and were seeking answers to participants' attitudes towards the adoption of the iPad mini and their beliefs regarding its ease of use.

During the TAM literature review, I identified conflicting attitudes regarding the TAM being used as a framework to explain attitudes towards the adoption of technology in education. For example, Buchanan et al. (2013) and Tsai et al. (2017) claimed the TAM is highly favored as a framework because it helps researchers calculate why people prefer one technology over another. Criticisms of the TAM was identified by Bagozzi (2007), who made claimed that it is impossible for one theory to explain why people adopt technology, while Benbasat and Barki (2007) claimed the TAM was not to be trusted because researchers changed the focus of their studies while using the TAM as their framework. Conflicting results were also found with the TAM regarding the factors that contribute to the adoption of technology. Several researchers claimed that the attitudes regarding the ease of use from various participants, such as educators, patients, and children have towards the technology influence decisions in adoption (Johnson & Howard, 2019; Luijkx et al., 2015; Rafique et al., 2020; Rahimi et al., 2018; Smeda et al., 2018; Taherdoost, 2018; Tsai et al., 2016; Venkatesh & Davis, 1996).

The conflicting opinions have given rise to a couple of limitations that might arise from using the TAM. One major limitation that may apply to my study is based upon Ajibade's argument that users may be obligated to use the technology the school issues them. This could cause some issues; however, it can be counteracted by asking more in-depth questions regarding the adoption process and examining the response to help develop deeper questions (Patton, 2015). Another limitation that is similar to the previous limitation that might arise is the TAM not fully explaining why the parents, who privately own the iPad, have accepted the technology, which can be deterred by examining

participants' responses and developing deeper, probing questions that might provide insight into their acceptance of the technology.

Using the TAM as the framework for this study offered some insight as to why this stakeholder group adopted the iPad and its apps for their child's language learning because the TAM is "fluid" and permits users to be from different lifestyles, cultures, educational backgrounds, etc. The use of the TAM helped outline how parents adopt the iPad and its apps for their children's communication needs, and it helped describe parents' views about the iPad's ease of use. All of the TAM literature reviewed had a focus on the attitudes of educators, patients, adult college students, and grade school-age children, but none of the literature identified the parental attitudes towards the adoption of the iPad (Chi-Yuch et al., 2017; Diop et al., 2019; Johnson & Howard, 2019; Kingsford et al., 2017; Smeda et al., 2018; Trinh, 2018; Tsai et al., 2017; Tsai et al., 2016; Luijkx et al., 2015).

Literature Review Related to Key Variables and Concepts

The key variables and concepts related to the literature discovered during the literature review were the use of the iPad as an AAC for speech-language impairments, the iPad as an AAC for communication needs, and traditional vs. non-traditional devices. A discussion of each concept follows.

Use of the iPad as an AAC for Speech-Language Impairments

The use of the iPad as an AAC was explored to explain how parents and educators are implementing the iPad and its applications (apps) as an AAC for students who have speech-language impairments. In DeCarlo et al.'s (2019) quantitative study, the

researchers claimed the parent or educator's attitude about technology such as the iPad while learners use it as an AAC directly affects their success or failure. DeCarlo et al. claimed that out of the 29 students involved in the study, 30% of these students who use the AAC do not consistently use their device, which eventually leads to them abandoning it. Furthermore, DeCarlo et al. sought to determine what factors contributed to the abandonment of the AAC and looked at the buy-in of 28 parents and 14 educators to determine if a weak support system and negative attitudes contributed to this phenomenon.

DeCarlo et al. study results showed that 92% of the teachers and 71% of the parents had prior AAC training with the device. However, 75% of the teachers had immersive training compared to the parents, who only 32% reported having immersive training. The study's conclusions found that even with high caregiver operational competency ($p = 93$) and buy-in ($p = .76$ - 1.), decreased device usage still occurred at home. The researchers suggested that the reduced usage was a result of parents not "creating communication opportunities" because parents were more concerned with becoming "operationally competent" (p. 478). DeCarlo et al. warned readers to interpret the result "cautiously" because of the limited knowledge provided on the parent and teacher participants (p. 478). Additionally, they claimed the results might not be generalized to other populations because the sample size was small, and the buy-in was high because there is an intimacy between the parents and teachers because the study was conducted in a school that created "an immersive AAC environment" (p. 478).

DeCarlo et al. study's strength is somewhat weak because of its limitations, which could be interpreted as not to be very trustworthy. The researchers claimed that future studies involve training that focuses on training parents and educators to learn to communicate with the AAC device because this training can be practical because it increases "parents' perception of their child's skills when using the AAC device" (p. 478).

Additionally, King et al.'s (2014) claimed that the iPad could be used to supplement speech generation as a means to support language learning in education. The researchers also claimed that exploring the function and responsibility of the educator using the iPad and its apps to clarify its usage is needed because children who have speech-language impairment are using it as an AAC. King et al.'s (2014) qualitative investigation used naturalistic observations on six non-verbal participants, ages six to 20 years old, identified by the faculty and administrators. The tools included the iPad with 63 apps installed; however, 28 different apps were observed being used, with the other 35 apps were not observed being used during the study. The study concluded that the iPad and its apps reinforce student learning and support communication for non-verbal students 51% of the time. However, 13 percent of the time, the iPad was used to play games. One could see this as a positive learning experience for the participants of the study. Nevertheless, some questions could be asked about this conclusion. Two particular questions need to be asked to strengthen the findings of this study. The first question that should be asked is: was the learning significant enough to make a difference in their communication skills and the other issue is, did the students learn enough to advance to

more challenging apps. The study also revealed that when educators were in attendance as students used the iPad, it increased the iPad's appropriate usage by 20%. The study also found that although the participants were "virtually nonverbal," they used the iPad as an AAC 36% of the time, while the apps were used 58% of the time, which indicated that further research is needed to isolate the behaviors on the part of the communication partner to determine if there was a relationship between the educator and the app category titled “fulfillment and violation” of app usage (p. 168).

King et al. (2014) discussed several “significant” limitations to the study that included the sample size of the exploratory study was small, with only six students of varying ages as participants, and the amount of time spent on the study was also short, and it was inconsistent between participants (p. 169). The school controlled the choice of apps used during the study, and the school decided which student could use what app or apps, which caused major inconsistencies in the controlled experiment. Additionally, the video recording lengths were inconsistent in that they varied in length of time over random days. The researchers argued that the video recordings should have taken place all day long, which would have provided “more consistent descriptive results” (p. 169). The researchers claimed the study was not very reliable due to these limitations and cautioned readers to be careful when interpreting the study results. One should err on the side of caution while interpreting the results of this study. This study is relevant to my study because the researcher recommends that future studies evaluate the skills needed by the communication partner to properly adopt and use the iPad and its apps as an AAC, which falls into alignment with the purpose of this study.

Mixed results were also found in D'Agostino et al.'s (2016) mixed-method study investigating the iPad and its app beings used for literacy learning. The study involved 14 teachers and 50 first-grade students enrolled in a "Reading Recovery" program. The researcher investigated what effects occur on literacy instruction when integrating the iPad and its app LetterWorks on children in the first grade, who were 6 – 7-years-old. The researcher used an experimental study with a "double random assignment" and incorporated a qualitative examination of teacher interviews. The results showed positive effects on literacy learning, but the teachers believed the app was a barrier because they did not believe it provided a "kinesthetic or tactile component" needed for student learning and would not continue to use the iPad and its apps. However, two of the teachers in the study revealed they would use the iPad and its apps because it was time-saving and increased student motivation. The researchers also claimed that teachers who used the iPad and its apps had higher scores on all three alphabetic-related measures within the study. However, no other differences were noted, but they preferred the "traditional way of learning" (p. 541).

D'Agostino et al. (2016) study's experimental portion randomly assigned students to either the treatment (n = 25) or control (n = 25). The results revealed there was not a significant difference between the treatment group when compared to the control group (p = *.84*) for letter identification; (p = .85) for the hearing and recording sounds in words, and (p = .82) for "DIBELS" letter name fluency (p. 537). The t-ratio was 3.11 on the post-test and not significant in the pre-test for letter identification; the t-ratio was 2.67 in the hearing and recording sounds in words and not significant for the pre-test, and the

post-test t-ratio was 2.42 in the DIBELS letter name fluency portion and not significant in the pre-test. Students who used the iPad had “significantly higher’ scores on the three alphabetic portions. The researchers speculated there were three possibilities this occurred: the students using the iPad were “more engaged” with learning the letter work portion; they believed there is something "inherently more efficient or useful" about the iPad's usage for learning letters as compared to magnetic letters, or the magnetic letters did not stay in place on the chalkboard, and this movement presented a challenge to the beginning readers (p. 540).

D'Agostino et al. (2016) defined one major limitation of the study as those students in the treatment group out-performing in the alpha-specific measure compared to students in the control group, which they cited the teachers’ beliefs about the use of the traditional learning methods as being a disadvantage for students. The sample size was a limitation because it could not be generalized to other schools implementing the Reading Recovery literacy program. Another limitation discussed was the teachers’ beliefs regarding the use of the iPad and its apps, which the researcher claimed needs further studying because this was a “reoccurring theme” in the qualitative study (p. 543). Although this study showed mixed results and one might not necessarily agree that this study should be considered as dependable or reliable, however, the research is relevant to my study because it shows there is a gap in the literature by stating that more studies are needed with regards to participants’ beliefs about the usefulness of the iPad and its apps as an AAC.

In a de Jong et al. (2010) mixed-methods study on using mobile technology to help conceptualize learning of languages, the researchers investigated the use of the iPhone 3 while web-based software that promotes language learning showed that in three treatment groups' pre-tests results, there was not a significant change. The study consisted of 35 people (18 males and 17 females) and consisted of three parts, a pre-test, learning, and post-test phases. The results were divided into three separate areas: desirability, usability, and knowledge gain. The desirability phase was completed through interviews about the participants' thoughts regarding the software were positive. However, the results also indicated that participants felt the software was slow, and it needed a search function added to make it easier to find the different language content. Additionally, the participants felt it was not very well organized for finding the different learning contents that were used in the study. The usability portion of the study measured the pragmatic quality (PQ), which was defined as how successful the participants felt they were in using the software; the hedonic quality identity (HQ-I), which was defined as the users identified themselves with the software; hedonic quality stimulation (HQ-S)m which measured the extent the users believed the software was "innovative and stimulating"; and the attractiveness (ATT), which defined the "global quality value of the product" (p. 114). de Jong et al. (2010) argued the results of the usability indicated the software was rated as negative, stating it was "technological and cautious." However, the participants also found it "manageable, inviting, and good," and that the software variations were "very attractive." Yet, there was "some room for improvement in terms of usability and hedonic quality in all cases" (p. 115). Results showed the number based

treatments were higher for usability (M = 1.25, SD = .34), as compared to the listbased approaches, which were lowest (M = 1.04, SD = .31). The researchers claimed the room-based treatments beat the object-based treatments in all usability evaluations.

In addition, de Jong et al. (2010) claimed the knowledge gain results indicated a considerable change after the treatment was given to the participants, $F(6, 28) = 2.93$, $p < .05$, $r = 0.79$. Also, the outcome of the content filter on knowledge gain was also noteworthy, $F(1, 33) = 5.70$, $p < .05$, $r = 0.42$. In addition, there was also considerable change noted with the knowledge gain of the selection method, $F(3, 31) = 4.88$, $p < .05$, $r = 0.69$. The location-based room filter used fewer movements as compared to all the other treatments, and it was evaluated highest for the pragmatic quality (PQ) in the usability test (M = 1.60, SD = .85) and beat the other treatments in knowledge gain. The Levene's tests used on all the evaluations were non-significant, which reinforced the hypothesis of uniformity of variance (p. 116). The post hoc tests included pair-wise t-tests with Bonferroni correction, revealed a significant difference between the semacode-based object filter treatment and the location-based room filter treatment ($p <.05$) (p. 116). Furthermore, the room-based context filter contrasted considerably compared to the object-based ($p < .05$). Lastly, there was a substantial change found among semacode-based and location-based selection methods ($p < .05$), and the other comparisons were non-significant. Nevertheless, de Jong et al. contended that knowledge was gained in two treatment groups after applying the treatment. However, the third group experienced issues with the treatment filters not working, and data could not be collected.

Additionally, de Jong et al. (2010) discussed one limitation that was described as the technology having some problems with the software needing to scan the semacode several times, which could have influenced the results of this study, and causes this study's results to be somewhat questionable, and possibly not a good study to make generalizations to other populations. Regardless of the lack of a discussion regarding the limitations, de Jong et al. (2010) and D'Agostino et al. (2016) both recommend that future studies are needed to measure the effects of usage of technology, such as the iPad and other mobile devices, have on learner performance and what the benefits could be. The above studies support the need for my study because the researchers recommend future studies look at the usage of technology, which could include ease of use since both groups of researchers made statements that their participants claimed there were issues with using the technology that was implemented in the studies.

Use of the iPad as an AAC for Communication Needs

King et al. (2017) claimed tablet technology could positively affect communication needs, and add value to learning, and there is a high potential for the use of tablet technology such as the iPad within education. This claim is based on the perceptions of 17 classroom teachers and speech-language pathologists' using tablets such as the iPad and its apps as an AAC. The study involved four focus groups finding answers regarding what they believed were the challenges of adopting the tablet and its apps as an AAC into the classroom, how the tablet would be used, and how to use it efficiently.

The results of King et al. (2017) study revealed four common themes that were broken into four categories labeled as different uses for the tablets; the barriers that accompanied tablet usage; unforeseen features of the barriers; and the benefits of tablets and the continued desire and commitment to using tablets. However, one participant stated, “It's a blessing, and a curse,” and the researchers stated the participants believed they would have to have some “expertise” to implement it properly in the classroom (pp. 8-10). The result also revealed that tablet usage in the classroom could present challenging behaviors, but they can “positively impact educational practice” (p. 8). However, King et al. claimed there are “gaps” in the available research concerning tablet usage in education, and further research is needed on the tablet being used in education that services students with communication needs (pp. 7-10).

In a qualitative study conducted by Pandya et al. (2016), the researchers observed a female student with ASD who used the iPad as an AAC to make a video. The researchers wanted to determine if the iPad was a useful tool that could help students with autism improves their learning. The study inadvertently showed improvement in the student's verbal communication skills because the "process" of making the video allowed the student to practice her speech articulation, speech volume, expression of herself and improved her social interactions with other students. These findings allowed the researchers to recognize the limitations of this study, which were their unfamiliarity with the iPad and its apps being used as a video recorder caused them not to plan for anything other than the video, which led to missed opportunities. Additionally, they did not apply the findings from the first recording to the design of a second recording, which could

have been used to identify elements that might be considered critical to student learning. They overlooked the influence that the participants' "instructional paraprofessional" had on the participant during the video recordings, which could "obstruct the academic and social opportunities" made available in the classroom (p. 427).

Despite the limitations noted, Pandya et al. recommended that future studies be conducted via multimodal, digital composing tools such as the iPad from an asset-based approach by focusing on the students' assets, abilities, and strengths. The findings in this study will be difficult to generalize to other populations because it only investigated one student who has ASD with communication needs. Then there is also a question of validity because of the limitations that were found within the study. However, the investigation does support the purpose of this study by recommending more studies be conducted on the iPad and its apps being adopted as an AAC. The recommendation for future studies supports the need for this study because the participant in this study accidentally showed improvement in their verbal communication skills, which one could reasonably assume that the adoption of the iPad and its apps combined with the ease of use were major contributors to this notable improvement in the student's verbal communication skills.

Murdock et al. (2013) in a qualitative study investigated the iPad and its apps as an AAC while using it to expand the pretend-to-play skills of four preschool-age children. The participants of the study involved four male children who have ASD. Murdock et al. described the children as being "verbal" and attracted to "playing with toys" (p. 2176). Although the children wanted to play with toys, the researchers asserted

the children did not have the "ability to demonstrate more advanced levels of play," predominantly the capability to create conversation for the characters. The researchers originally began the study with three participants and added a fourth participant because the child with the pseudonym Andrew began to display “challenging behaviors” during classroom and therapy times. The researchers believed the other three children could help alleviate Andrew's “withdrawal child assent” (p. 2176). This study sought to determine if there might be a “functional relation between the play story intervention and target play” while considering changes in the children's behavior during the intervention and baseline of the study (p. 2180). The results reported by Murdock et al. study showed that "three of the four participants" were scored as “overall low and stable performance” while being observed during the study’s baseline observation (p. 2187). However, the researchers claimed a “rapid response” to the study’s intervention portion created an “initial steep improving slope" during these observations. Additionally, the researchers stated there was a well-defined practical relation” that manifested during the play story intervention, which created a "positive connection when the participants’ using “play dialog” (p. 2187).

The Nonoverlap of All Pairs (NAP) effect size measure was utilized for Murdock et al. study and was calculated with the (NAP) procedure, measured as ‘‘weak effects: 0–0.65; medium effects: 0.66–0.92; large or strong effects: 0.93–1.0” (p. 2180). Bradley had an increase in play dialogue (PD) and the NAP evaluation for Bradley’s intervention phase resulted in “strong effects from baseline to intervention” with the NAP = 0.99. The p value was 0.0079, which the researchers claimed this was a “significant chance that the

true effect size lies between 0.075 and 1.00" (p. 2180). However, Jacob had a low performance during the baseline, but during the intervention, Jacob showed a "large and sustained increase" during the interventions (p. 2180). Jacob 2's NAP resulted in a medium effect from baseline to the intervention (NAP = 0.92), and significant change was noted (p =0.0048\0.05) on the true effect lying between 0.66 to 0.98 (p. 2182). Andrew had "strong but variable levels of PD" for the baseline and varying levels, resulting in no improvements shown from baseline to intervention. Andrew's NAP showed weak effects (0.56), and there was not a significant difference in the PD (p = 0.3221) (p. 2184). Contrary to these results of the previous students, the researchers claimed Joe had "immediate, substantial, and sustained increases in PD" after completing the intervention. However, the researchers claimed Joe had "low and stable" rates during the baseline. Joe's NAP analysis indicated there were "strong treatment effects" (NAP 0.97), and the p-value was 0.0042, which Murdock et al. claimed the true effect size was between 0.74 and 0.97 (p. 2182).

There were three limitations discussed by Murdock et al. that focused on the small participant sample size limiting the generalization of the study to other populations. A second limitation was that one participant entered the study later than the other participants, which lessened the intervention's impact used on that participant. The third limitation was that the study's natural observation was hindered because the noise levels within the natural classroom prevented "accurate data collection" during the video recordings (p. 2187). Nonetheless, the researchers advocate future research of the iPad and its apps being used as an AAC because this is a "new technique," and future studies

could help generalize these results to other populations (p. 2187). This study supports the need for my research because it advocates future studies looking at the adoption of the iPad and its apps as an AAC in a “naturalistic setting” (p. 2187). Additionally, the researchers claimed that ease of use is why the iPad is adopted because it is easy to use by “students who have developmental disabilities” in various educational settings, such as in the home or playgroups (pp. 2175, 2186-2187).

Baker's (2017) qualitative study investigated the use of the iPad as a speech recognition (SR) technology tool to determine its usefulness as a supportive reading tool in an elementary classroom. The study involved eight first graders who had been identified as struggling readers by their teacher. The results revealed that when the iPad was used with certain apps such as Dragon speech recognition, Siri, Alexa, and Cortana, it did support reading and that learning to read did occur at a higher level when compared to traditional reading methods such as Language Experience Approach. Baker described the limitations of this study as the SR not having “child-safety options,” which resulted in the SR reciting inaccurate words, such as “hell” instead of hill, which prompted a need to supervise student participants closely (p. 307). A second limitation was that student participants observed teachers speaking their thoughts aloud as they recorded them into the SR, which "empowered" student participants to do the same, which could inadvertently remove teachers’ need for the recording sessions. A third limitation is that SR removed the need for student participants to learn how to spell. It does it for them, which caused the oral language not to be converted into written language with a pen or pencil, thus eliminating a fundamental learning objective needed by all students. This

resulted in a fourth limitation to emerge in which student participants did not write their final composition; instead, they dictated it, which led to them skipping brainstorming and outlining drafts, which compromised the school standards of maintaining a paper trail of their progress and work.

These limitations led to Baker recommending that future studies investigate the possibilities of using the iPad with its apps that include a text editor while using the SR app. Moreover, the researcher suggested that other studies look at the feasibility of using the SR with older students who have a good understanding of the writing process. This study is relevant to my study because it investigated the perceived usefulness of the iPad as an AAC as students use it for their communication needs, which is the purpose of my study.

Eubanks et al. (2018) mixed-methods investigation strived to answer if there was a demonstrated difference in elementary school students' writing and their attitudes about writing after participating in a "technology integrated" language writing workshop using the iPad and its apps as the technology (pp. 350-351). The study involved 24 students, ages 7, and 8, who were asked to raise their hands if they would like to volunteer after obtaining their principal and parental consent. The researchers used pre-and post-surveys to determine changes in students' attitudes towards writing, which consisted of six questions. The results of the paired-samples t-test showed "significant differences" to "highly significant" with the Cohen effect size (d= 0.94), which researchers claimed was "high practical significance" (p. 357). In addition, the results revealed there were improvements with students' attitudes in the areas of writing notes to friends, writing at

home for fun, writing Chinese in their free time at school, writing Chinese in their free time at school, writing about what they just learned in Chinese and improved attitude when they receive a new notebook, journal or diary as a gift after the pre-and post-surveys were compared. Additionally, the post-survey indicated that “negative attitudes” that were demonstrated in the pre-survey had turned to “positive attitudes” after implementing the iPad into the writing lesson (p. 368). Furthermore, the qualitative portion of the investigation looked at artifacts, field notes, and observations of the students’ written assignments were used to define 60 themes that showed improvements with writing skills, and “positive/motivated” themes were found in 51 of the 60 themes (p. 362). The results of the second portion of the study indicated that improvements were made to writing skills, and improvements in “reading, speaking, and listening skills” (p. 362).

Eubanks et al. (2018) study’s limitations included a discussion regarding the small number of participants used to minimize the generalization of the results to other populations. The researchers claimed the participants’ age made it difficult to collect "accurate surveys" from the participants and to counter this limitation, the researchers recommended that future studies involve older participants. The researchers also argued the study’s short length of time made the results not as accurate because if the study had spanned the entire school year, the results might be “more accurate” (p. 362). They also claimed there might be some bias because only one person conducted the observations and that having others conduct observations could lead to different viewpoints regarding how the data is recorded. The researchers recommended that future research include

qualitative studies that looked at different opinions and perspectives regarding the iPad's usefulness as a learning tool and that older students be studied to determine if age and lack of understanding of the study were instrumental in the results of the study. This study is significant to my study as it investigated the usefulness of the iPad and its apps as an AAC, which is the purpose of my study. Additionally, the researchers recommended that future studies look at the iPad's usefulness as a learning tool being used by older students, such as the stakeholder population identified in my study, which falls into my study's problem statement and purpose.

In contrast to the previous study's limitations, adverse effects were reported in Ward et al.'s (2013) quantitative study that investigated the iPad's effectiveness, benefits, and limitations of the iPad in a high school science classroom. The study included 49 high school students from three science classes. Although the study revealed that students scored low in the pre-assessment lab worksheet average score was 1.1 out of 3 (*n=49*), they scored higher in the post-assessment after the lesson was taught, and they implemented the lesson on the iPad. The post-assessment average score was "2 out of 3 (*n=49*)" (p. 381). Ward et al. claimed the debriefing process and additional lessons were significant contributors to the post-assessment scores increasing. The investigators asserted that many approaches could be used to implement the tablet into the classroom; however, a school should do a need assessment to determine how the iPad fits their learning objectives, goals, and technological needs. Ward et al. did not recommend any future research, although there were implications revealed for educators. Investigators recommended that educators develop a strict timeline to keep students on task and create

lessons that “amply benefits of the platform” compared to the tablet’s limitations (p. 383). The researchers also argued that Apple restricted the use of Java and Flash-based web content, which limited the use of the iPad in education. Ward et al. study is supportive of my study because it investigated the students’ and educators’ attitudes towards the perceived usefulness and ease of use regarding the iPad being used in education, which is the purpose of this study: examining parents’ attitudes regarding the perceived usefulness of the iPad and its apps as an AAC and their beliefs regarding the ease of use of the iPad and its apps as it is used as an AAC by their high school students who have communication needs.

Boyd et al.’s (2015) review of the literature found that the newness of the iPad makes research limited regarding its usage as a communication tool in the classrooms of students with communication needs. The researchers claimed some investigators are making their apps to research the iPad because there are not many apps available to research. A final limitation of the study was that the studies review showed students using only the iPad and its apps. The researchers argued that more research is needed because there are more individual apps, and comparison between apps could be beneficial for both educators and caregivers of students with communication needs. Ward et al. (2013) and Boyd et al. (2015) studies are significant to this study because both groups of researchers argued that more research is needed regarding the usefulness of the iPad and its apps while being used as an AAC.

Engin and Donanci’s (2015) qualitative research examined if the iPad is a useful tool that helps promote a dialogue between teacher and student in the English as a second

language classroom. This study asked three questions: did the use of the iPad create events for dialogic teaching, how its usage hinders occurrences, and are iPads fitting for dialogic instruction. The study included 234 adult learners, ages 18 to 22, from 12 classrooms of female participants and one classroom of male participants, and one educator from the 13 classrooms in a college located in the United Arab Emirates. The methods used to gather data included notes gathered during the lessons, interviews, and transcriptions of the lessons. The results showed that the use of the iPad did create events for dialogic teaching, but it could limit conversations, and at the same instance, it can promote conversations. The researchers claimed the educators used most of the lesson time explaining the lesson instructions, which limited the amount of time for actual conversations. However, when conversations did occur, they were good if the student and teacher had the skill set to use the iPad. The researchers argued this was because the iPad is a technology tool, and its usage depends on how comfortable or experienced the users are with the iPad and its apps. The researchers recommended that future studies involve what makes a conversation and investigate the "attitude and skills" between educators and learners (p. 278). This study supports my study's problem statement, which is to understand better attitudes toward the adoption of the iPad and its apps being used as an AAC and the beliefs about ease of use participants have toward the iPad and its apps as an AAC device while students use it to help with their communication needs.

Stark and Warburton's (2018) quantitative study explored the usefulness and practicability of the iPad used by patients with chronic aphasia to self-deliver their speech therapy. Twelve patients were initially selected; however, only ten patients completed the

study, and the participants consisted of three females and seven males, ages 54 to 87 years old. The researchers allowed the patients to select their treatment dosage and language; the Bejeweled and the Language Therapy apps were prescribed for therapy. The patients used the apps for an average of 20 minutes a day for four weeks.

The Cohen effect size was used in Stark and Warburton's study, and Group 1 had a large effect size on post-treatment when related to the baseline ($d = 1.155$). Additionally, the researchers conducted a Wilcoxon Signed Rank test, which showed no substantial change between post-Bejeweled scores and baseline scores ($Z = 1.34$, $p > .05$). Post-therapy related to post-Bejeweled for Group 1 created a "very large effect size ($d = 3.491$)", which endorsed the effect of therapy on the CAT measurement (p. 826). However, Group 2 received first condition language treatment; they had a large effect size for the treatment than the baseline ($d = 2.730$). The post-Bejeweled compared to baseline had a large effect size ($d = 2.120$). Nonetheless, the effect size was small when the post-treatment was equated to the "post-Bejeweled ($d = 0.228$) treatment" (p. 826). Additionally, all the patients had a "small to medium effect size ($d = 0.448$)" when comparing the post-Bejeweled treatment to the baseline treatment ($d = 0.365$) (p. 826). The researchers claimed that when post-treatment was compared to post-Bejeweled treatment, it revealed a "small effect size ($d = 0.073$)" (p. 826). The researchers claimed that the progression of the study also had a small effect size for treatment when the study was completed, and the "patients made gains in content units ($d = 0.464$)" (p. 826).

Stark and Warburton claimed the results showed improvement with the self-delivered language and phonological development. Also, an "inverse relationship

between severity and proportion improvement" was revealed (p. 828), which means that more significant improvements in language usage were noted in the patients who had more severe aphasia that used the treatment compared to those patients who had mild aphasia. The researchers recommended that future studies involve exploring the potential use of tablet-based speech therapy with varying degrees of aphasia. This study supports my study's purpose, which is to understand attitudes toward the adoption of the iPad and its apps being used as an AAC and the beliefs about ease of use participants have toward the iPad and its apps as an AAC device while students use it to help with their communication needs.

In McClanahan's (2012) qualitative study, the researcher claimed the iPad is a relatively new technology tool that is being implemented within the educational realm of Speech/Language Pathology, but studies are limited. Additionally, the author asserted that iPads have an overabundance of apps that help assist individuals with communication needs. Despite this overabundance of educational apps for the iPad, McClanahan argues there are limited amounts of empirical studies available to prove or disprove the effectiveness of the iPad's implementation into speech-language classrooms, which creates a need for more research to support the iPad's practicality with individuals who have speech and language deficiencies. Implementation with the iPad involved a "mini-lesson on a skill" in which the fifth-grader needed extra support, reading passage that used "before, during and after reading strategies," an assessment that kept a "running record," reading for fun that was self-regulated by the student at his reading level, and "journal writing" (p. 28). McClanahan claimed that permitting the student to use the iPad

to read has novelized it, and the game-formatting concept encouraged motivation, curiosity, and concentration. The student's confidence increased, and he believed he had influenced the regulation of his reading. Additionally, McClanahan argued that commercially developed games, eBooks with text-to-speech, and computerized learning games all have research to prove the educational benefits of their effectiveness. Nevertheless, the iPad does not, and future studies are needed.

Waddington et al. (2017) qualitative case study used an iPad to conduct a quantitative study to investigate the iPad being used by an 8-year-old boy with ASD while using the iPad and its apps as a speech-generating device in different settings to determine if the child could request an assortment of items from his communication partners. The study included baseline sessions, intervention, procedural modification, generalized procedures, and distance to iPad procedures that mimicked the baseline sessions. The results indicated a successful intervention, with 80 percent accuracy, only after practicing the baseline procedures six times and having two sessions. The study also revealed the child could apply the learning in different settings, including his living room, classroom, and office in a clinic, and he could retrieve the iPad when it was placed at different distances within these locations without additional interventions. However, the results indicated the child's communication skills were decreased, as well as him taking more time to retrieve the iPad as the locations changed, depending on the child's familiarity with the locations. The researchers claimed this study is limited in generalization because it only involved one participant and that the child’s prior learning may have influenced the outcome of this study. Future studies recommended by

Waddington et al. include focusing on using various settings while teaching conversational and social communication skills and investigating skills being taught in new environments with unfamiliar communication partners. This study is relevant to my study because it investigated the perceived usefulness of the iPad as an AAC as a student used it for their communication needs, which is the purpose of my study.

Kent-Walsh et al. (2015) experimental study looked at a continuous intervention program that used "modeling" and targets that were similar and different to help students change the order of yes/no questions to see if the intervention could be generalized on to other sentence styles while students used the iPad and the Prolog to Go app as the AAC device. The study involved two students who were four years old and one six-year-old who had previous experience using AAC and had motor speech disorders. Kent-Walsh et al. claimed the results revealed the average improvement rate differences (IRDs) had a large effect on all three students when the baseline was compared to the intervention phase for "Dependent Variables 1 and 2 75.69%" (p. 230). The IRD score for Adam w 92.86%, Bella had 84.21%, and Clay's was 55.56%. The researchers claimed the results for the IRD had a "very large effect" for all three children when the baseline was compared to the generalization probes for Generalization Variables 1 and 2. Additionally, Kent-Walsh et al. stated the IRD was 100% when the maintenance intervention was compared to the baseline, which created a "lasting effect" for all three children (p. 230). The study results indicated that participants could effectively achieve the use of the iPod Touch and the Go Talk app within a two-week period, which they argued was a "rapid rate for the acquisition of a communication repertoire individuals with autism" (p. 263).

The researchers also claimed the results showed that the participants' "aberrant behaviors" declined to "zero" (p. 263). Along with the decrease in the peculiar behaviors, the students began initiating communications, responded more often to others, and that peer interactions also increased with the use of iPod Touch and the Go Talk app. The researchers also claimed the results of the study showed that all three children were able to invert the yes/no questions into sentences after the treatment was applied. The children were able to generalize the sentences within the rules of English writing while using the iPad and the Prolog to Go app. Kent-Walsh et al. claimed the limitations of this study include the small number of participants that prevented it from being generalized to other populations. They could not identify the impact of each lesson delivered due to the varied approaches used in the intervention. Additionally, future research should include a more significant number of participants with motor speech disorders, and other studies include comparisons with children who have motor speech disorders and children who have different language impairments while using the iPad and the Prolog to Go app. This study is significant to my research because it shows how the iPad and its apps are being used as an AAC. It also supports the problem statement of my research that is seeking to understand better the attitudes toward adoption and the beliefs about ease of use parents have toward the iPad and its apps as an AAC device while their students use it to help with their communication needs.

Chang and Wang (2018) conducted a parallel study as Kent-Walsh et al. (2015) experimental research, using the iPad as an AAC intervention device. However, Chang and Wang's qualitative study wanted to determine if student communication skills would

change during snack time while using the iPad as a video recorder to model behavior. The study's participants totaled three students, ages 9 to 12 years, who had developmental disabilities. The researchers used multiple baseline approaches to assess the need for an intervention that consisted of a three-tier video modeling intervention. After applying the baseline approaches and intervention, the results indicated that students' communication skills increased during snack time and their "inappropriate behaviors" such as grabbing peers' food dropped off (p. 219). Additionally, the researchers claimed students' requests were more accurate, and their random inaccurate symbol selection decreased.

Furthermore, Chang and Wang noted that participants' peers also began mimicking the communication skills being used by the study participants but were not measured during this experiment. The researchers recommended that future studies replicate this study but use other children who are not ELLs because "most speech-generating devices" are marketed towards English-speaking students (p. 219). Additionally, the researchers recommended that other future studies look at peer behaviors in different settings outside a classroom and explore the use of individualized videos in group settings for other interventions. Chang and Wang's investigation is significant to this study because it inadvertently revealed the participants' peers' "spontaneously performed" the same behaviors as the participants due to the use of the iPad, which mirrored the purpose of this study to understand the ease of use of the iPad and its apps while students use it as an AAC (p. 219).

Evidence from a wide range of literature has been provided to show the breadth of information regarding the use of the iPad as an AAC by students who have communication needs. Additionally, the literature shows mixed results, with some research showing dramatic improvement with communication skills and other research showing no improvements. The literature review showed that even though there were improvements with communication skills, the improvements staggered because oftentimes, staying on task was difficult for participants. As technology usage increases inside and outside the classroom, a gap in the literature exists in regards to the purpose of this study, which is to determine the parents' attitudes regarding the adoption of the iPad and its apps as an AAC and their beliefs regarding the ease of use of the iPad and its apps as it is used as an AAC by their high school students who have communication needs.

Traditional Versus Nontraditional Devices

Due to the advanced use of technology in the field of augmentative and alternative commutations, speech-generating devices are increasingly being used by individuals who have communication needs because they are "diverse, portable, and affordable" (Robillard et al., 2018). In addition, mobile technology optimizes the learning process by eliminating the time barriers presented by traditional learning environments, and this type of learning "represents the next generation of information technology" (Krivoruchko et al., 2015, pp. 159-160, 167). Additionally, Krivoruchko et al. argued several advantages of using non-traditional tools, which include allowing students easy access to their lessons, providing immediate feedback, and allowing students to customize their learning to their own needs. However, mobile technologies do have some

negative effects, such as the lack of a teacher being present to help if the student has difficulty learning the language skills, and the cost of equipment can be expensive.

Krivoruchko et al.'s (2015) quantitative experiment involved 82 students, who were split into two groups: the experimental group contained 41 students and the remaining students in the control group (pp. 164, 166). The results showed there were "significant changes" in the experimental group, and the Student t-criterion results for the experimental groups were tEmp = 6.3 (p. 167). The researchers claimed that the time needed for learning grammar was "significantly reduced," communication competence improved as well as improved student motivation and self-regulation increased (p. 167). However, the researchers did not present a discussion of any limitations they may have found within the study, and one believes the lack of a discussion regarding the limitations minimizes the usefulness of this study, and it certainly makes one question the reliability of the study. Regardless of the questionable reliability of this study, it still is relevant to this study because the researchers did recommend future studies involve investigating the learning process for improving language skills, which could be interpreted to include the purpose of this study, which is to examine parents' attitudes regarding the adoption of the iPad and its apps as an AAC and their beliefs regarding the ease of use of the iPad and its apps as it is used as an AAC by their high school students who have communication needs.

Arthanat et al. (2013) quantitative pilot study investigated four students with developmental disabilities to compare the students' use of a traditional computer and mouse against the use of an iPad and its apps. The study revealed that in three out of four

students, there were no differences between the use of the iPad and the computer. For Brycen's baseline trials involved color recognition, his mean participation score was 2.67 with a standard deviation (Std) equal to 0.45, and it was somewhat higher with the iPad 2.58, Std = 0.45. Brycen's score for learning shapes with the computer was 2.13 average mean, and Std = 0.48. However, his scores increase when using the iPad (mean 2.71, Std = 0.53). Furthermore, the researchers claimed that Jake's participation with the iPad was higher than his computer scores. Jake's intervention scores were moderately higher while using the iPad, while learning to count, his scores went from mean scores of 2.00 (Std = 0.47) to 3.00 (Std = 0.14); and his scores for spelling went from 2.29 (Std = 0.08) to 3.42 (Std = 0.29). Whereas, Neil's scores indicated there were no differences when using the computer (mean 2.96) or iPad (mean 2.83) for learning money and reading. The researchers claimed that an absence of any corresponding data points between the baseline and the interventions indicated that these three participants had higher participation with the iPad than the computer. Evan's sessions focused on counting using coins and reading by word recognition, and his scores showed no differences between the use of the iPad and the computer. However, unlike the other participants, Evan's scores dropped while using the computer and remained unchanged while using the iPad. Researchers claimed that Evan showed less interest in the activities and preferred to skip the activities, so he could "play games" (p. 210). Additionally, the researcher claimed that Evan became "impulsive and hasty to finish the task" during all the trials, and he needed "prompting for about 75%" of the time (p. 211).

However, Arthanat et al. claimed that Jake had “clearly better” interaction with the iPad than the other participants (p. 211). The investigators noticed that all four students “were eager to use the iPad” and immediately began their lessons (p.211). Nevertheless, Arthanat et al. stated that all students were off task more often when using the iPad and believe it affected the outcome of the study. The researchers recommend more studies to look at the iPad's scope to “better clarify” the results (p. 211). The researchers describe the limitations of this pilot study as being limited to time, which they felt a longitudinal study could validate the use of the iPad within academics, which could produce more accurate results. They also felt they did not have control over other learning, which may have influenced their study results. The study was limited because all the participants were males and no females fit into the purposive sampling criteria. The observational tools that were developed specifically for this study were not vetted in other student participation studies. The apps used for the interventions were explicitly geared toward learning goals, and the researchers felt it influenced each student's participation and learning. Regardless of the limitations, the researchers suggested future studies are needed to look at the usability of the iPad as a learning tool for students who have individualized educational needs. This study is relevant to my research because the researchers claimed the students were excited about using the iPad and argued the usage of the iPad did not provide any “limitation in initiation,” which fits this study’s RQs regarding beliefs about the perceived usefulness and ease of use of the iPad and its apps while students use it to assist them with the communication needs (p. 211).

The purpose of Hill and Flores' (2014) quantitative study was to examine emerging treatments using Frost and Bondy's Picture Exchange Communication System™" (PEC) and the iPad™ Proloquo2Go™ as an AAC. The PEC is a picture-constructed, low-tech AAC approach, and the Proloquo2Go app functions as an optical or graphic communication interference to help students navigate PECS to make a request. The five participants included two preschool-aged students diagnosed as developmentally delayed (DD), one was a preschool-aged child, and two others were both elementary school-aged and identified with ASD. They were identified as participants because they needed to develop practical communication skills. The study results varied between students, such as Student A, Student C, and Student E's treatment integrity data for the iPad were collected for the meetings with an average score being 100%. Nevertheless, Student B's results were a 93% average score accuracy. Student D's PECS treatment integrity data resulted in a 93% average score accuracy, the treatment integrity scores for the iPad data for 33% of the iPad meetings with a 100% accuracy score average. The researchers contended that the study showed mixed results as learners responded in a different way with each intervention. In addition, the researchers argued that interventions like the PECS could be a sensible method to use with children who are in the beginning stages of developing their communication skills. The study's limitations included a discussion regarding a student participant going off-task, which limited the number of unprompted requests. The same participant observed the teacher moving from screen to screen while using the iPad and developed the same skills, which resulted in fewer independent requests. Another limitation was that the exchange was not private

between teacher and student participants during the different phases of the intervention. Another limitation was the recordings of the students tapping the screen were recorded as "goldfish," which hindered accurate data collection and prevented some reinforcements (p. 53). Participants who were not familiar with the PECS treatment found it difficult for them to build upon prior skills. However, the study revealed that when students use both the iPad and PECS as interventions, they responded differently to each intervention. The researchers argued that communication interventions that involved technology such as iPads need further research to show that it may be implemented as a viable tool that is easy to use by some students who have communication needs to obtain basic communication skills. This statement supports my study's need because the researchers' argued that the iPad and the Proloquo2Go™ app were easy to use by the participants who had communication impairments. This fits into my study's first RQ regarding participants' attitudes about the iPad and its apps perceived usefulness as an AAC as students use it for their communication needs.

Grigoryan and Babayan's (2015) qualitative study investigated the use of the iPad at a female college focused on the teachers within a technology-centered language classroom. The researchers sought the answer to how the iPad affected two teachers' speech skills, patterns, and activities while interacting with students. The study revealed that one teacher was uncomfortable using the iPad and its apps, referring to it as a "thing," and identified her as a non-adopter (p. 295). They defined the non-adopter as being outdated in their speech behaviors and patterns, using technology as a last resource, and not making a connection to students who want technology used in their classroom. In

contrast, the other teacher was very comfortable using the iPad during class and described her as an adopter. The adopter is defined as a person who uses technology and is up to date regarding their speech patterns, skills, and behaviors, as demonstrated by teacher one, who used technology in the classroom without problems or wasting time because of her comfort with technology. Grigoryan and Babayan's study also revealed that when teachers fail to use technology in the classroom, they hinder students' learning because these teachers do not speak the same language as the modern student. The researchers recommended future studies be conducted on how other teachers implement different technology in classrooms, how teachers understand the "nature and purpose of educational technology," and how alternative speech skills are represented through the use of technology in a classroom that teaches a second language to learners (p. 296). This study is relevant to my research because the researchers claimed the one teacher was uncomfortable using the iPad and its apps, having a perceived negative attitude towards adopting the iPad and its apps. Whereas the other teacher was identified as an adopter because she was at ease using the iPad and its apps, she had a perceived positive attitude towards adopting the iPad and its apps. Grigoryan and Babayan's study is directly linked to this study's RQs regarding beliefs about the attitudes about the perceived usefulness and ease of use of the iPad and its apps.

A similar technology-driven study was accomplished by Hwang et al. (2020). Hwang et al.'s quantitative study investigated the relationship between parental beliefs about dual language development and language development at home related to the child's vocabulary knowledge. The study involved 190 students from three elementary

schools. The researchers recommended that future studies look at incorporating more peer interactions with multiple languages or traditional picture-centered communications. Hwang et al.'s research is relevant to my research because it investigated the perceived usefulness of the iPad as an AAC as a student used it for their communication needs, which is the purpose of my study.

Alzrayer et al. (2014) conducted a meta-analysis to decide if the use of the iPad and iPod impacted communication learning skills with students who have developmental disabilities and autism. The researchers searched the EBSCOhost Web and ERIC to find the studies. They used the keyword/terms "using iPads for communication, iOS devices and communication, autism and iPads/iPods, autism and iOS, Proloquo2Go and autism, SGD and iOS and tablet-based computers and autism" to gather the data. This search generated 316 pieces of literature, and they eliminated most of the literature by reviewing the abstracts looking for the key terms, which revealed 15 pieces of literature that involved a total of 52 participants compiled into the meta-analysis. The researchers looked at the participants' age, skill set, behavior issues, previous experience with iOS, and disabilities. The results reveal that most of the 52 students were school-aged and had a diverse range of disabilities and challenging behaviors that included "aggression, self-injury, hitting, kicking, eloping, and slapping" (p. 181). The results also showed that out of the 52 participants, 44 had no previous experience with iOS systems. The results showed that positive effects were recorded while students used the iPad/iPod as an intervention for their communication skills, with it being "highly effective" as an SGD for 23 of the participants and 12 participants' communications skills being "moderately

effective" as an SGD (p. 189). The researchers concluded there is a "critical need for more research" involving individuals with developmental disabilities and speech communication impairments, particularly looking at their daily activities and the effectiveness of AAC interventions (p. 189).

Dennis et al. (2016) investigated the outcomes of the adapted alternating treatment design (AATD) that involved the use of the iPad as a learning tool, comparing it to teacher-led instruction to determine which method improved upon verb knowledge of pre-school children, ages four and five. The researchers identified several limitations of the study, including that both pre-and post-test might be strengthened if the study's pre-assessment of target verbs was included. The researchers stated the words and numbers were "too challenging" for some students and had some uncertainty with the use of the ordinal scale analysis (p. 172). Another limitation disclosed by the researchers is that the purpose of the study was to compare iPad instruction against teacher-led instruction. However, the amount of time spent on the intervention was only 10 minutes each day, and this may not have been enough time for either method of delivery to allow the student to obtain substantial knowledge of verb usage. The researchers recommended that future studies investigate interventions that provide "more challenging or complex" words that are easy to understand to further develop their language skills. The researchers of this study recommend that more research be conducted to see if students are developing their language skills using an iPad.

Sessions et al. (2016) investigated the negative impact that occurred when necessary writing skills and writing instructions were trimmed out of the curriculum

standards in elementary education in the United States. The findings revealed that when the iPad and the appropriate apps were used to supplement instruction, students' writing improved. It also revealed that students were "actively engaged in learning," which helped foster their confidence, and the students collaborated more because everyone could contribute (p. 224). They felt "autonomy, belonging, and competence," which also kept students motivated to learn (p. 224). The study also disclosed that if teachers blended their writing instructions with the iPad and its apps, student learning would improve, students were less likely to fuss about their lessons, and they were more inclined to self-help when they became stuck with the assignment.

Bean et al.'s (2019) paper on assistive technology or ACCs discussed the potential of technology helping improve students with disabilities learning when combining technology with lesson delivery. Bean et al.'s (2019) paper focused on the use of vocabulary as often an underlying component that needs to be addressed when the use of ACCs is implemented in the classroom. They claimed that educators who choose the technology to be implemented into their classrooms should consider the needs of the students and ensure the gadget can handle rapid changes, and the devices should be easily maintained. Bean et al. (2019) maintained that schools should provide the appropriate professional development for educators using the technology because this will help them keep students learning.

The above discussions regarding traditional communication devices as compared to non-traditional devices shows that research is investigating technology such as the iPad being used in place of traditional communication devices for students' communication

needs (Alzrayer et al., 2014; Bean et al., 2019; Dennis et al., 2016; Jimenez & Stanger, 2017; Sessions et al., 2016). However, the research did not provide any studies looking at the parent stakeholders and their thoughts or beliefs about the non-traditional tools such as the iPad and its apps being used for their children's communication needs. Furthermore, researching the parental attitudes toward the adoption of technology and beliefs regarding the ease of technology's use is imperative because most communication skills are developed at home under the guidance of parents (Ramírez et al., 2020), but any recommendations were overlooked by the majority of the researchers, showing the gap in literature and justification for this study (Ardies et al., 2015; Bean et al., 2019; Crook et al., 2015; D'Agostino et al., 2016; DeCarlo et al., 2019; Mathieu, 2021).

Summary and Conclusions

Technology adoption is subjective to the attitudes and believed perceived ease of use by adopters (Davis et al., 1989; Young et al., 2014). The literature presented in this chapter clearly shows that students with all types of communication needs use tablet technology, such as the iPad and its apps for their communication needs, and most are showing signs of improvement with their communication skills with the adoption of tablet technology such as the iPad (Alzrayer et al., 2014; Bean et al., 2019; Clark et al., 2014; D'Agostino et al., 2016; Kent-Walsh et al., 2015; Krivoruchko et al., 2015; Sessions et al., 2016). The use of the TAM as the conceptual framework helped define how parent stakeholder groups adopt the iPad and its apps for their children's communication needs, and it will help define their beliefs regarding its ease of use (Davis et al., 1989; Hwang et al., 2020; Young et al., 2014). Additionally, the literature provided

some understanding regarding the attitudes and beliefs that educators and student participants had towards the adoption of technology (Bean et al., 2019; Chang & Wang, 2018; D'Agostino et al., 2016; Hwang et al., 2020). Although most of the literature identifies elementary students and educators as their primary participants, they recommend future studies targeting other stakeholder populations, which support a gap in the literature and a need for this study. As technology usage increases inside and outside the classroom, a gap in the literature exists in regards to the purpose of this study, which is to determine the parents' attitudes regarding the adoption of the iPad and its apps as an AAC and their beliefs regarding the ease of use of the iPad and its apps as it is used as an AAC by their high school students who have communication needs.

While this research supports the need for this study, in Chapter 3 I provide a discussion on how this qualitative study was conducted in order to obtain a better understanding of the parents' attitudes regarding implementing the iPad and its apps, and their beliefs about its ease of use while it was used as an AAC by their high school for their communication needs.

Chapter 3: Research Method

Introduction

The purpose of this generic qualitative study was to examine parents' attitudes and beliefs about the adoption and ease of use of the iPad and its apps as an AAC to meet students' communication needs. Although there is substantial research that has focused on teachers' perspectives on the iPad as an AAC for students (e.g., Ardies et al., 2015; Bean et al., 2019; Crook et al., 2015; D'Agostino et al., 2016; DeCarlo et al., 2019; Mathieu, 2021), there are few studies of how the parent stakeholder group perceive this technology. I conducted this study to address gap in the literature.

In Chapter 3, I provide a thorough overview of the methodology that I used in this generic qualitative study. Detailed and explicit information substantiate why this design was the best choice for this study. The Research Design and Rationale section includes justification for using the generic qualitative approach. Additionally, I detail how the participants were identified based on Merriam and Tisdell's (2016) recommendations. I also discuss my role as the researcher, including the steps that I took to minimize researcher bias. The Methodology section includes details on recruitment offers a conversation concerning how this study was managed and how the participants' identification and recruitment were conducted. Chapter 3 provides a discussion on how the data collection and data analysis was conducted. Additionally, a conversation is provided regarding how the data was collected, analyzed, and transcribed into themes that provided a true and accurate description of the participants' viewpoints and experiences.

Lastly, there is a discussion regarding the ethical implications and a conversation regarding the protection of the participants' privacy.

Research Design and Rationale

The RQs for this study were

RQ1. What are parents' attitudes about the perceived usefulness of the iPad as an AAC for high school students with communication needs?

RQ2. What are parents' beliefs about the ease of use of the iPad and its apps as an AAC for high school students with communication needs?

I selected the generic qualitative approach for this study because I sought to understand the participants' beliefs and views regarding the iPad and its perceived usefulness and ease of use. Merriam and Tisdell (2016) argued that the goal of a generic qualitative study is to "uncover and interpret" (p. 25) how individuals perceive the events and circumstances of the lives that make their lives logical to them. The generic qualitative approach is flexible; the researcher attempts to summarize participants' responses into themes before drawing a connection between the purpose of the research and the themes (Kahlke, 2014; Liu, 2016). Kahlke (2014) argued that some researchers find that their questions are not suitable for "the confines of a single established methodology" (p. 38). Still, in many studies, the use of the generic qualitative approach permits the flexibility and opening to stay within the confines of the qualitative approach (p. 38). In addition, Liu (2016) defined the generic qualitative approach as detailed and revealing, which allows the researchers to identify and differentiate the "phenomenon, process, perspectives and worldviews" (p. 131) of the participants within the study.

Furthermore, generic qualitative approaches have led to the creation of a variety of valuable tools that allow researchers to utilize and intertwine into their work (Cooper & Endacott, 2007; Kahlke, 2014; Liu, 2016). Liu (2016) argued that researchers using this design are not confined to traditional qualitative approaches that are rigid, which frequently causes the researcher to "pay insufficient attention to the substantive findings of the social reality" and that five traditional qualitative approaches: phenomenology, grounded theory, ethnography, case study, and narrative research do not always “fit all empirical studies” (p. 129). However, there are some critics of the generic qualitative approach and a discussion of critics will follow.

Liu (2016) warned that the generic qualitative approach does have guidelines that must be met to ensure the studies are thorough and accurate. Based on Liu's guidance, I developed descriptive interview questions, emphasizing main ideas that were relevant to this study’s purpose. The participant selection for this generic qualitative study was purposeful, and the research process was cyclical, moving back and forth between questions to gather data, and analyze the data. The data analysis focused on developing themes and interpretations from the evidence. I stopped the data collection and data analysis for this study after data saturation was reached. This study’s findings encompass the most important themes, and the study can be generalized to other similar populations (Liu, 2016).

Regarding sample size, Moser and Korstjens (2018) argued that qualitative researchers should only analyze data until reaching saturation and use sufficient detailed data that reveal themes that support the study’s purpose. Schreier (2018) stated that the

sample size could range from one to 40, and the sample could include individuals, documents discussing circumstances regarding events that influence participant's behaviors. However, some researchers, such as Guest et al. (2006), Guetterman (2015), and Mason (2010), argued that deciding on an estimated sample size is necessary for some circumstances, while other researchers claimed the sample size could hinder the quality of qualitative research (Palinkas et al., 2015; Robinson, 2014).

I opted against using the quantitative approach because this study did not seek to understand the relationship between variables that would be generalized to larger populations. I was not seeking to produce knowledge or specify an explanation into what is or is not essential about the stakeholders' attitudes towards adoption or their beliefs regarding the iPad and its apps ease of use as their child uses it for an AAC (Allen et al., 2015). Furthermore, the phenomenological approach did not fit this study because it does not seek to answer the lived experiences and commonalities between participants regarding the iPad and its apps as an AAC (Creswell & Poth, 2018). An ethnography approach was also not selected because this study is not trying to define a group or culture (Givens, 2008). I opted not to conduct a qualitative case study because case studies are used to answer the "how or why" questions being asked when the research's focus is investigating an event that might be happening (Yin, 2018, p. 1). Also, in this study I did not look to help establish "good teaching practices" through developing and implementing policies, which is also a goal for using case studies (Mills et al., p. 2, 2010).

Based upon the recommendations from Creswell and Poth (2018), Merriam and Tisdell (2016), Patton (2002, 2015), and Schreier (2018), the intended sample size was 8 to 10 participants, however 8 parents of high school students who have communication needs were recruited. This number of participants provided enough balanced data and reasonable coverage and did not cause the data to become repetitious. I ensured that the participants met the sampling criterion, which was defined as being a parent of students who have communication needs.

Role of the Researcher

As the researcher, I strove to conduct a study that might provide insight into the participants' perceptions regarding the iPad and its apps as an AAC to meet high school students' communication needs. The researcher's role in a study is to collect, assemble, evaluate, and examine data (Aspers & Corte, 2019; Merriam & Tisdell, 2016). Although researchers are the main tool for data collection and analysis in a qualitative study, they are prone to bias that may influence a study (Merriam & Tisdale, 2016). Merriam and Tisdell (2016) noted, though, that researchers can steps to identify and minimize potential bias.

To minimize bias, I remained open to comments and ideas contrary to my own beliefs and reported these findings within the data. I strove to keep my thoughts and opinions to myself during the interviewing process by using an interview script (Rubin & Rubin, 2018; Yin, 2018). I maintained a high level of ethics by upholding the university's rules and regulations. I also strove to maintain the highest level of integrity towards participants (Rubin & Rubin, 2018). I encouraged participants to express their opinions

by not straying from the premise of the interview questions. In reporting the findings, I also sought to provide transparent data that show participants' original expressed opinions (Rubin & Rubin, 2018). Additionally, I used a journal to record my thoughts and ideas to work out any bias. Writing about my biases allowed me to concentrate fully on gathering the data from the interviews. Also, I was open to, and compared my findings to, studies that were contrary to mine (Yin, 2018). Additionally, I ensured that I did not have any personal and professional relationships with the participants. I did not have some supervisory or instructor position that could entail any power over the participants.

Methodology

I used a generic qualitative approach, which allowed this study to be flexible and encapsulate the participants' responses that were analyzed into themes that correlated to this study's purpose. This study was based upon the attitudes parents had regarding the perceived ease of use of the iPad and its apps as an AAC and their beliefs regarding the ease of use of the iPad and its apps as it was used as an AAC by their high school students. The sample size was a total of 8 parents of high school students in high school Grades 9 through 12 who have communication needs; however, only eight parents were used in the study.

Participant Selection Logic

Fusch and Ness (2015) claimed that there is not "a one-size-fits-all" number and that the collection method determines data saturation, not the sample size of participants. Data saturation is defined as the point reached when data provided by new participants is redundant and does not add any new themes or concepts to the study, and failure to reach

saturation causes the research to be considered questionable, which Fusch and Ness argue, “hampers the content validity” (p. 1408). Additionally, Patton (2002) claims, “there are no rules for sample size in the qualitative inquiry” (p. 244). Determining the sample size is related to the question being poised and comparing the sample size to the purpose of the investigation. Moreover, the author advocates that qualitative research investigation employs small or the least amount possible for samples that offer “expected reasonable coverage” of the encounter experienced by participants, and it represents the “stakeholders’ interest” (p. 246). Merriam and Tisdell (2016) claimed that there is no set number, yet for dissertation proposals, the researcher recommended one offer a “tentative, approximate number,” which for the purpose of this dissertation was eight participants (p. 102). Patton also adds that the sample should be stopped as the data gathering in the field “unfolds” and quit sampling when data becomes redundant (p. 246). There were several suggestions made by other qualitative researchers regarding participant selection, such as Crouch and McKenzie (2006), suggest less than 20 participants be selected. However, Bowen (2009) suggests eight participants and Latham (2013) suggests 11 to 12 participants and Alase (2017) claimed the participants could range from 2 to 25. Based on the above discussion for participant selection, the total number of participants targeted was 8 to 10, but 8 were recruited, which provided enough balanced data, reasonable coverage, and data saturation. Additionally, there are no standard amounts of participants that can specifically determine when data saturation is met, and it becomes redundant.

Merriam and Tisdell (2016) argued that purposive sampling should occur before data collection, and the sample selection should be representative of the interest of the study. Neuman (2011) argues that to obtain data that fits the research, the researcher must purposely select participants who have experienced the event. Neuman (2011) claimed purposive sampling is enlightening and used as the correct data collection strategy when looking for participants. Gentles et al. (2015) argued that participants are selected because they have knowledge about the subject being investigated. For this study, purposive sampling was used to select participants from the targeted population. Patton (2015) claimed that a chief advantage of purposive sampling could provide "rich" data that gives insights into the "conditions, people, or events" that are significant to the researchers (p.264). Gentles et al. (2015) claimed that the participants are selected based on common characteristics, which correlate to the study's relevant topic and questions. Additionally, Creswell and Poth (2018) asserted that purposeful sampling offers tremendous details because the sample is selected because they can "best answer" their specific questions (p. 148).

To be chosen for this study, participants were parents who identify themselves as having children in high school students, who had communication needs and lived throughout the United States and were using the iPad and its apps as an AAC for their communication needs. Additionally, only parents with children in high school Grades 9-12 were qualified.

Instrumentation

Merriam and Tisdell (2016) argued that data collection for generic qualitative studies is dependent upon the framework of the study. Creswell and Poth (2018) asserted that different forms of data collection used in qualitative studies are continually emerging for web-based interactions used for interviewing groups or individuals, using email messages, visual, sound, and digital methods for data gathering. In qualitative research, Merriam and Tisdell (2016) and Creswell (2013) contend that the investigator should use multiple types of data collection, such as interviews, observations, documents such as journals, and audio-visual materials. For this study, interviews of the participants via FaceTime, Zoom meetings, and phone interviews consisting of open-ended questions were used.

Creswell and Poth (2018) recommended that multiple interviews be conducted along with using documents such as journals to obtain a realistic participant perspective. Additionally, Creswell (2013) asserted that interviews are handy when participants cannot be observed, and it allows participants to provide historical background. It permits the investigator to maintain control over the study. Interviewing allows for knowledge construction to be developed from the interactions between the participant and the interviewer (Creswell & Poth, 2018). In addition, to eliminate any potential bias that could have arisen from interview questions, pretesting of the questions was completed. Furthermore, the questions were worded carefully to avoid leading questions; they were properly vetted and reviewed by an expert to ensure that the interviews' fully developed questions were used (Yin, 2018). Additionally, in order to avoid reflexivity, which is a

bias that could arise through conservations during the interview that is not within the scope of the interview that can "color" the interviewee's response; the interviews remained as short as possible to eliminate the reflexive threat (Yin, p. 120).

Data collection was conducted via FaceTime, Zoom meetings, and phone interviews consisting of open-ended questions gathered from students' parents in high school Grades 9 through 12. Face-to-face interviews were not conducted due to safety concerns that are in place to avoid infection of COVID-19. Additionally, recordings of the FaceTime sessions, Zoom meetings, and phone interviews were conducted (only with expressed permission from participants) from each participant. The recordings were transcribed and evaluated to discover participants' attitudes regarding the adoption of the iPad and its apps as an AAC and their beliefs regarding the ease of use of the iPad and its apps as it is used as an AAC by their high school students who had communication needs. Data collection also involved the recordings of my personal perceptions of the interviews in a journal.

Additionally, the interview questions consisted of unstructured, open-ended questions to allow participants to elaborate and expound upon. There are seven interview questions derived from the first RQ and seven questions derived from the second RQ that I sought to answer. Table 1 shows the alignment of the RQs, conceptual framework, and interview questions that were used in this study.

Table 1

Alignment of the Research Questions With the Conceptual Framework and Interview Questions

Research question	Conceptual framework	Interview question
RQ1. What are parents' attitudes about the perceived usefulness of the iPad as an AAC for high school students with communication needs?	TAM - the perceived usefulness of the iPad as an AAC as their students use it for their communication needs	What did you believe about the usefulness of the iPad before it was implemented into your child's communication learning needs? How do you feel about your child using the iPad and its apps as an AAC for their communication needs? What factors may have influenced your decision to use it as an AAC for your child's communication needs? What factors may have deterred your decision not to use it as an AAC for your child's communication needs? What was/were the deciding factor/factors for using the iPad that led you to adopt it as an AAC for you? What do you find useful regarding the iPad and its apps as your child uses it as an AAC? What do you find difficult regarding the usefulness of the iPad and its apps as your child uses it as an AAC?
RQ2. What are parents' beliefs about the ease of use of the iPad and its apps as an AAC for their high school students with communication needs?	TAM - beliefs parents have regarding the iPad and its apps ease of use as their high school student uses it as an AAC	What do you think about the ease of use the iPad might offer your child as a communication tool? What other communication tools has your child used for communicating? What do you think about the iPad's and its apps ease of use? What do you like best about the iPad and its ease of use being used as an AAC? What do you like least about the iPad and its apps being used it as an AAC? How do the iPad and its apps ease of use compare to other communication tools used by your child? Which of the communication tools used by your child do you believe has been easiest to use? Why?

Note. TAM = technology acceptance model; AAC = augmentative and alternative communication.

I used the audio recordings of the FaceTime sessions, Zoom meetings, and phone interviews from each participant and I transcribed verbatim to evaluate the participants' responses to discover their beliefs regarding the perceived usefulness and the ease of use of the iPad being used by their child as an AAC for their communication needs at home. In addition, I kept a journal of my perceptions of the interviews that reflected my thoughts regarding the participants' responses (Rubin & Rubin, 2018).

Procedures for Recruitment, Participation, and Data Collection

Creswell and Poth (2018) argued that participants must be easy to find and access. To recruit participants, I sent solicitation letters to the local high schools that explained the study focus and eligibility criteria for participants, Walden's IRB guidelines. In addition, a recruitment flyer was placed on the schools' PTA Facebook page explaining the study, along with the criteria for volunteers for the study. My invitation for potential participants was supposed to be forwarded to parents by the cooperating schools, which would have allowed the identified recipients to self-evaluate their eligibility and return their information to volunteer for final selections to be made. Additionally, the use of social media platforms was a contingency plan that was in place in case I was not able to recruit from schools. However, no schools were used in this study, and all participants in this study self-identified through my recruitment efforts via Facebook groups.

Recruitment efforts began immediately upon receipt of Walden's IRB approval on April 22, 2021. Walden's IRB discouraged me from contacting school officials because of the strict measures in place to protect student populations. Although it was discouraged, I emailed 21 high schools within the San Antonio metropolitan area, and

only one school authorized me to recruit from their high school. Appendix C contains the invitation letter I prepared for the school official to send to parents. The school principal identified a point of contact on their staff as the school secretary. I emailed and called the high school's appointed staff member several times and never received communication from the staff member.

Walden's IRB recommended that I recruit from various social media platforms, such as Facebook, so I adjusted my recruitment plan accordingly. Appendix D contains the recruitment flyer that I posted on various organizations' social media platforms. This effort provided two participants volunteering and completing interviews. At this point, I considered my recruitment efforts as a complete wash, so I turned to my dissertation chair and methodologist for advice to revise my recruitment plan. On September 13, 2021, I reapproached Walden's IRB to request provisions to my original application be changed. These changes included expanding my recruitment area from the San Antonio and Austin, Texas metropolitan areas to all the United States. I also requested permission to add a small incentive in the form of a Walmart gift card for $10.00. My request was approved by Walden's IRB on September 20, 2021, and I immediately restarted my recruitment efforts. My efforts paid off, and I recruited eight participants from various areas of the United States. All eight participants contacted me via my Walden email account. I promptly responded by sending them the consent form with instructions to respond by typing "I consent" within the body of the email if they agreed to participate in the study. I asked them to return it to me so I could contact them to schedule the interviews. A detailed discussion of my recruitment efforts is included in Chapter 4.

Interviews were conducted and recorded via FaceTime sessions, cell phone, and Zoom conferences by myself in the privacy of my home. Conducting interviews in this manner addressed the need for social distancing due to the COVID-19 pandemic. The interviews consisted of unstructured, open-ended questions (see Appendix E) so that participants could elaborate. The interviews involved one interview session that lasted approximately 20 to 60 minutes per participant. I used the interview questions, following a script (see Appendix F), along with a review of my own personal reflection journal to obtain data, and interviewing continued until data saturation was met. I informed participants that I would send them a copy of the transcribed interview for their review. I asked them to review it, comment, and/or correct it to ensure the interview accurately reflected their thoughts. I also explained how they could access the study after it was completed and published in ProQuest. Once ProQuest released the study, I also informed each participant that I would send a pdf copy of the abstract to all participants via email.

Furthermore, at the end of each interview, the interviews were transcribed and summarized. Although a transcript review was sent to the participants, none of the participants responded to the request. After six months of heavy recruitment efforts, I concluded the data collection portion of this study and began the data analysis of this study.

Data Analysis Plan

Creswell and Poth (2018) stated that data analysis involves three stages: preparing and organizing the data, converting data into themes through the process of coding, and then discussing the data that may include charts and tables. The qualitative RQs for this

study were as follows: What are parents' attitudes about the perceived usefulness of the iPad as an AAC for high school students with communication needs?, and What are parents' beliefs about the ease of use of the iPad and its apps for high school students with communication needs. The data analysis of this study provided a profound look into the outcomes and expanded on the details of the results, particularly as related to the perceived usefulness and ease of use that parents had about their child using the iPad as an AAC for their communication needs.

Data files for this study were created to ensure that the appropriate data analysis was achieved. The notes were carefully arranged, organized, and read thoroughly to help extract codes from the data (Patton, 2015). For the purpose of this study, I used pattern matching to analyze the data. Candela (2019), Merriam and Grenier (2019), and Ziegenfuss & LeMire (2019) argued that pattern matching is the method to find meaning phrases and words that are common within the study. This analysis provided an in-depth discussion of participants' experiences as it pertains to the phenomenon that this study was investigating. Significant statements were identified and grouped into themes. From the themes, a detailed story emerged that told the parents' attitudes regarding implementing the iPad and its apps, and their beliefs about the ease of use the iPad and its apps have on how students learn language.

In addition, I looked to find any "discrepant or negative" cases that emerged while conducting the data analysis and reported these findings to present a full and accurate representation of all the themes that emerged during the analysis of the data. Rose and Johnson (2020) claimed that researchers should always report such findings because it

opens the data to “multiple interpretations,” increases the validity of the research, and presents a “more realistic (and believable)” interpretation of the study (p. 443). The data analysis coding was manually conducted to capture “the nuanced and complex work of data analysis” (Gallagher et al., 2015, p.71). Use of software to help with coding was not used for this study because Ziegenfuss (2019) claims that using software such as NVivo only offers data management and organization of the data that was gathered during the interviews, and Saldaña (2016) claims that data analysis software is not capable of providing the detailed and rich codes that symbolize the qualitative data.

Issues of Trustworthiness

Trustworthiness in qualitative research is essential as the researcher is trying to expand the knowledge of a particular phenomenon. Moser and Korstjens (2018) claimed that trustworthiness is answered by asking, “can the findings be trusted” (p. 121). The issues of trustworthiness that did arise within this study include dealing with the credibility of the research, single researcher collecting the data, managing one’s personal bias, data saturation, transcribing and analyzing data, transferability, dependability, and conformability. A discussion concerning these issues as separate segments will follow to ensure this study is considered to be a credible and trustworthy research study.

Credibility

Credibility is created by instituting the truth of the study’s conclusions; it means presenting accurate and honest answers. According to Moser and Korstjens (2018), credibility is the same as internal validity used in quantitative research and is concerned with “neutrality” (pp. 121, 122). For this study, Credibility is defined as “confidence”

that is put upon the findings of the research as being truthful and an accurate account of the participants' opinions, views, and ideas that were revealed during data collection (Moser & Korstjens, p. 121). Furthermore, Caelli et al. (2003) argued that other researchers often view generic qualitative studies as not rigorous enough, and there should be methods or strategies in place that establish a more rigorous generic qualitative study to ensure credibility. I conducted a transcript review, such as suggested by Moser and Korstjens (2018) to ensure this dissertation was rigorous and credible. They defined transcript review as having the participants reevaluate the transcriptions of the data to confirm their true thoughts were communicated during the interview.

Anney (2014) contends that a relationship between the participants and the researcher must be established to achieve trust between them. Moreover, I established a relationship with this study's participants, but I was not too outgoing or social with the participants to eliminate the potential for researcher bias occurring, which Anney strongly warns against. However, this study may contain research bias, which Patton (2002) asserted can occur innately. As an exerted effort to deter bias within this generic qualitative study, I assessed this study by conducting an examination of a "goal-free evaluation" (p.307). Patton defines a goal-free evaluation as a method to conduct "fieldwork and gathering data" that contrasts the results with true responses or opinions of the sample participants (p. 169). Furthermore, in a personal journal, all my thoughts and notions regarding the interviews were documented and it was analyzed in an effort to eliminate any preconceived ideas and biases.

Triangulation is used in qualitative research to “control bias” and establish validity (Golafshani, p. 603, 2003). Shenton (2004) recommends attempting to avert researcher influence to use triangulation of different methods to gather data, such as interviews, focus groups, and the use of pre-existing data. Triangulation of the data from this study consisted of the interview questions and responses, transcript review, and researchers’ journal of personal perceptions of the interviews. I conducted triangulation in this study to ensure the study was unbiased and presents an accurate depiction of the participant's perceptions of the research questions.

Transferability

Moser and Korstjens (2018) argued that transferability is related to applicability, and the reader is solely responsible because they know their “own setting” (p. 122). However, according to Liu (2016), qualitative studies can be generalized to other populations of similar studies. Transferability was applied in this study because I found the data revealed could be the starting point for readers to make the “transferability judgment,” which is their assessment of the study and how it applies to their setting, demographics, population size, and socio-economic characteristics of their specific topic (Moser & Korstjen, 2018, p. 122).

Dependability

According to Merriam and Grenier (2019), dependability is concerned with the consistency of the study. The researchers described it as another person deciding to replicate the study in a similar manner by utilizing the same method, questions, and participants, and the conclusions of the reproduced study would reveal comparable

outcomes to the original study. Furthermore, dependability does not mean the results will be an exact copy of the original results; however, they will "make sense – they are consistent and dependable" (p. 28). Merriam and Grenier argued to use triangulation, transcript review, and an audit trail to ensure dependability. The researchers described an audit trail as the details of how the research design was planned and executed, recordings of the fine details revealed during the interview, and evaluation of the process that determines the study's effectiveness. To make certain that the data for this study were dependable, I provided a thorough and detailed report on how the study was planned, designed, implemented, and analyzed. The report includes all the raw data gathered from the interviews and the detailed analysis of the data that emerged as a result of the data analysis. The data from the interviews is included with this study, and the interviews fit within the established methods of this study to ensure this study is considered by other researchers as dependable.

Confirmability

Confirmability happens once credibility, transferability, and dependability have been demonstrated (Queens University of Charlotte, 2022). Moser and Korstjens (2018) defined confirmability as the researcher's need to remain objective while conducting an investigation. This must be established to ensure that the participants' words and thoughts are correctly relayed in the study's findings. I took precautionary steps to provide a detailed audit trail that includes how the data collection, analysis, and interpretation were conducted. I also provided a detailed discussion regarding the coding process that revealed the themes and explained the meaning of the individual themes. This helped

ensure the participants' views and perceptions were truly conveyed in the data, and their personal opinions or beliefs reflected the study. Furthermore, I requested the participants to review their transcripts to provide their feedback regarding the accuracy of the data (Candela, 2019). Although it was extended to all eight participants, none of the participants returned feedback to me. Additionally, triangulation of the data helped explain my behavior to offer a more stable explanation of the data to the readers of this study (Noble & Heale, 2019). It also helped ensure that researcher bias was minimized, and it helped give the reader more confidence in the findings of the study (Patton, 2002; Shenton, 2004).

Ethical Procedures

Ethical procedures set at the beginning of this study and maintained throughout the course of this study are intended to ensure participant protection. These procedures include sending a full disclosure of the research to the participants and informing them of its purpose. This researcher will ensure that participants are entirely aware that their participation is strictly voluntary. Moreover, I will be polite, respectful, and courteous regarding the participants' religion, gender, culture, and other differences that may be present. Yin (2018) expresses that the researcher is obliged to maintain a highly ethical relationship with participants, regardless of what rules and mandates are enforced by universities, research institutions, and governments.

The following ethical procedures were followed throughout the data collection portion of this study, which ensures the data collection was not compromised. It included me avoiding asking leading questions, and I did not disclose any sensitive information.

Additionally, any data and the resources used to collect the data during this study is stored and safeguarded in protected and locked locations. The data were analyzed several times, and any conclusions that are conflicting or contrary to the study were described to ensure the data mirror true and accurate views of the participants. Also, participants of this study were assigned fictitious names, and composite profiles were developed. I also completed a self-examination to make sure that any personal bias and narrow-minded or unfair ideas were not included within the results reported (Creswell & Poth, 2018; Patton, 2015; Yin, 2018). This was completed by conducting self-examining and writing about my thoughts on my interest in the subject and background and experiences with the data collection. Also, a discussion of my role in the data collection and analysis process was included any possible effects that this researcher may have on the data during this study (Patton, 2015; Yin, 2018).

Furthermore, to ensure that I conducted an ethical study, an application for this study was submitted to Walden University's IRB. I submitted a letter of cooperation from the school's staff members stating that they would forward the invitation to the parents of students in Grades 9 through 12 who use iPads to address their communication needs. The school name, location, staff members' names, titles, and positions are not included to ensure the confidentiality of the school, participants, and the participant's children using the iPad and its apps as an AAC. I have marked the data as confidential and stored in a locked file on my computer for at least five years, and after that time, the data will be deleted. For any paper data collected, it was shredded or burned to ensure the confidentiality of this study and anyone involved in the process of it.

Summary

The rationale for the generic qualitative approach is provided in Chapter 3. The methodology section details how this study was conducted, and it includes how the participants' were identified and their recruitment process. A conversation regarding how the data collection and data analysis was converted into themes was also provided. Chapter 3 also presents a discussion regarding how the participants' viewpoints and perceptions were assembled into themes. Finally, the ethical concerns and protection of both the data and participants were explained. Chapter 4 will contain a discussion of the data and analysis that was obtained through this study. Chapter 5 will include a discussion, a conclusion, and a summary of the research.

Chapter 4: Results

Introduction

The purpose of this generic qualitative study was to examine parents' attitudes and beliefs about the adoption and ease of use of the iPad and its apps as an AAC to meet students' communication needs. The TAM was the conceptual framework. I sought to answer the following two RQs:

RQ1. What are parents' attitudes about the perceived usefulness of the iPad as an AAC for high school students with communication needs?

RQ2. What are parents' beliefs about the ease of use of the iPad and its apps as an AAC for high school students with communication needs?

In this chapter, I present the study's findings. The chapter includes a description of the setting, participant demographics, and the process of data collection. I discuss the data analysis provide evidence of trustworthiness before presenting the results of the study. This discussion is followed by a chapter summary.

Setting

I conducted this study during the COVID-19 pandemic. However, I did not discuss any personal conditions that could have affected the participants or their experience at the time of the study, which could have altered the interpretation of the findings of this study. All interviews were conducted via cellphone or the Zoom videoconferencing application in the privacy of my home, where no one else was present, and the participants chose an environment to be interviewed that they deemed safe, private, and accommodating to their personal needs. I took these safety measures to

ensure that all parties were safeguarded from any potential exposure to the COVID-19 virus.

Demographics

The total number of participants for this study was eight. The participants were parents of high school students in Grades 9 through 12 who had speech/language impairments. Six parents in the study were female, and two were male. Two (one male, one female) had sons, and six (five female, one male) had daughters. Participants' children had various degrees of speech/language impairments (see Table 2).

Table 2

Demographic Data of Parent Participants

Participant (parental status as mother or father)	Son or daughter	Verbal/Nonverbal utterances	High school grade
P1 (mother)	Daughter	Nonverbal	9
P2 (father)	Son	Verbal	10
P3 (mother)	Son	Nonverbal	10
P4 (mother)	Daughter	Verbal	9
P5 (mother)	Daughter	Verbal	9
P6 (father)	Daughter	Nonverbal	9
P7 (mother)	Daughter	Nonverbal	9
P8 (mother)	Daughter	Verbal	9

Data Collection

I received approval to begin the data collection for this study from Walden's IRB on April 22, 2021 (approval no. 04-22-21-0418372). Initially, recruitment efforts were in the local high schools in the San Antonio and Austin, Texas, metropolitan areas, along with contacting the social media platforms from Easter Seals, Texas School for the Deaf and Hard of Hearing (Austin, Texas), Texas Autism Society, Austin and San Antonio (Texas), Texas Autism Centers, Randolph Spouses Club, The ARC of San Antonio and

Facebook private group pages to recruit participants. I also sought membership in 28 private Facebook groups in the early days of recruiting. This effort produced two prospective parent participants.

Due to the lack of response and cooperation from the local schools and various social media platforms, including the private Facebook groups that were originally targeted to recruit participants, I adjusted my recruitment plan and contacted Walden's IRB to request permission to change recruiting efforts. The adjustments to my recruitment plan involved expanding the location from San Antonio and Austin, Texas, metropolitan areas to the entire United States and using the Walden Participant Pool. I also asked permission to revise my recruitment flyer to include a small token of appreciation to help increase my chances of recruiting. The small token of appreciation was in the form of a $10.00 eGift card from Walmart for each participant after they completed the interview. IRB approval for these adjustments was granted.

With the new recruitment efforts in place, I joined six additional Facebook groups whose members lived in various areas throughout the United States, making my group membership a total of 34 groups. I also sent private messages to a total of 89 private parent members of these groups and received feedback from approximately10 members, most stating that they did not qualify because their child was either out of high school or in elementary school. This effort produced another six participants for this study, which enabled me to ensure that rich data were collected and I could reach data saturation.

The participants consisted of one father and one mother who had sons and one father and five mothers who had daughters. All of the children were 15 years old, in high

school, and had speech/language impairments. I conducted private interviews with each participant via FaceTime, cellphone, and Zoom meetings in the privacy of my home. Each interview was individually recorded with expressed verbal permission from each participant using the Voice Memo app on my Mac BookPro. Each interview lasted approximately 20 to 60 minutes. Before each interview, the participants were emailed a consent form for their review and replied "I consent" to indicate their permission to be interviewed.

Data Analysis

Upon completion of the data collection, I implemented the data analysis plan by preparing and organizing the data, converting the data into themes that emerged while coding the data, and reporting the data. The original data analysis plan was to use data analysis software such as NVivo or Quirkos to assist in the data management and organization. However, I decided to code the data manually because the sample size was small enough to do this. The manual coding was a lengthy process, and I conducted seven reviews on the data to reach data saturation. During the interview process, I made notes that I revisited as a part of the data analysis. I also made notes on the spreadsheet as I made passes while I analyzed the data. I engrossed myself in the data as I progressed through each pass by revisiting my handwritten notes taken during the interviews. While reviewing the data, I also re-listened to the interviews and reread the interview transcripts, which helped me become deeply familiar with the data. I developed codes from the data that addressed the two RQs, which were as follows:

RQ1. What are parents' attitudes about the perceived usefulness of the iPad as an AAC for high school students with communication needs?

RQ2. What are parents' beliefs about the ease of use of the iPad and its apps as an AAC for high school students with communication needs?

I used various colors of highlighters to indicate the separate reviews of the data, and I highlighted the words and phrases that stood out on each analysis of the data (see Appendix G). I extracted the codes from the participant statements and my notes related to each regarding each pass of the data. I organized the statements based on similarities, which allowed me to develop code words and small labels for the commonalities found within the data.

The first data analysis cycle revealed 30 phrases and words that were repeated throughout the data. As I proceeded with the second review of data, 352 phrases and words that were similar in context with others emerged. An example of the coding process that demonstrates how the raw data revealed codes is presented in Table 3.

Table 3

Illustration of the First and Second Coding Steps

Coding step	Participant interview response	Code
1st	"It's just empowering. And it really does show you that these kids do have a lot to say and that they can be taught; and for my son, it wasn't natural."	Empowering
1st	"It does open up a whole world of words"	Usefulness
	"His fingers are not allowing him to use the iPad on his own."	Difficult to use
2nd	"Technology has made it easy."	Everyone has to learn how to operate it
2nd	"It takes a village."	Takes others to help

By the third review of the data, I had grouped prominent phrases into 127 categories that were similar in content. Similar codes that conveyed comparable beliefs or words, such as parents who stated their beliefs about the usefulness of the iPad as being empowering, phenomenal, self-advocating, or powerful were coded under the word "empowering." These categories were grouped into bigger themes during the fourth coding pass, which revealed 22 developing themes. The fifth review allowed me to condense the 22 developing themes into nine bigger themes, such as parents believe it was empowering and deciding factors for selecting the iPad. A sixth review of the data was completed that led to the development of eight large themes and six subthemes. Also, in the sixth pass, two unexpected themes emerged with this evaluation of the data. A final seventh pass led to the development of six all-encompassing major themes and three subthemes connected to these seven themes. For example, under the parents believe it is empowering theme, the subtheme concerns for other children emerged, and under the theme ease of use, the subtheme hope was developed. The seventh final pass also allowed

me to see how the themes and subthemes were directly related to each RQ and the conceptual framework upon which this study was based. Additionally, the seventh pass allowed for the development of two discrepant cases that emerged under the second RQ. Table 4 provides examples of the development of the themes and subthemes that emerged during the final four coding passes.

Table 4

Coding Examples for the Final Four Coding Steps

Coding step (focal point)			
4th (identification of bigger themes)	5th (identification of bigger themes)	6th (identification of large themes and subthemes)	7th (identification of major themes and subthemes)
Watches movies	Uses other than AAC	The iPad's usefulness	Other uses than AAC Usage
iPad is a backup	I'm partial to PRC Vantage Light	iPad versus other devices	N/A
Gets easier over time	Ease of use	Ease of use	Hope
Growth	Realized there were motor impairments	Frustrations	Frustrations from various things
Some kids do learn to talk	It's empowering	Parents believe it is empowering	Concerns for other children
School uses other low tech	Attitudes about using low tech	Thoughts about schools	N/A

Note. AAC = augmentative and alternative communication.

The six major themes are listed in Table 5.

Table 5

Themes by Research Question

Research Question 1	Research Question 2
Theme 1: Parents' Belief That iPad Was Empowering	Theme 7: Ease of Use
Theme 2: Concerns for Other Children	Theme 8: Need for Support From Others
Theme 3: The iPad's Usefulness	Theme 9: iPad Versus Other Devices
Theme 4: Other Uses Than AAC Usage	
Theme 5: Pros of Using the iPad	
Theme 6: Cons of Using the iPad	

Note. AAC = augmentative and alternative communication.

Evidence of Trustworthiness

Establishing trustworthiness or validity in qualitative research is difficult as the researcher is trying to increase the understanding of a particular subject. Moser and Korstjens (2018) and Ravitch and Carl (2016) claim that trustworthiness is determined by the study's credibility, transferability, dependability, and confirmability. I had to ask myself, can the finding in this study be trusted (Moser & Korstjens, 2018)? To establish the validity of this study, I paid careful attention to how I viewed the data. I paid close attention to how I collected, analyzed, and understood the data as I extracted from the individual interviews (Merriam & Tisdell, 2016).

Credibility

Credibility is defined by Merriam and Tisdell as comparing the finding of the research to reality. In addition, Liao and Hitchcock (2018) argue that researchers who conduct coding, theme analysis, and result interpretation in a consistent manner to convey credibility. To ensure that I established the credibility of this study, I had my dissertation chair, and committee member review my interview questions to scrutinize them to ensure

the questions were aligned with the study's RQs. In addition, their examination ensured that my participant population understood the interview questions to ensure that they answered the questions clearly and did not have any doubt about their responses. In addition, while organizing and analyzing the data, I constantly reviewed the recorded interview, transcripts, and my notes to ensure my RQs examined what they were developed to do and that I captured the opinions and ideas of the study's participants in a precise and accurate manner. In addition, I sent the coding spreadsheets to my committee member for her review as another effort to ensure the credibility of this study. Having my committee member review the coded spreadsheets also increased the credibility of this study while at the same time, decreased the chances of bias or misrepresentation of the data.

Transferability

Transferability is associated with applicability, and the reader is solely responsible because they determine if and how the study relates to it (Moser & Korstjen, 2018). Transferability ensures that the possibility of the generalization in a qualitative study is congruent and can be applied to other situations is met through the use of "rich, thick description" (Merriam & Tisdell, 2016; Wood et al., 2020). The results of this study align with fields such as using iPad technology as an AAC, using iPad technology in special education, and using the iPad technology for speech and language communication tools. According to Daniel (2019), transferability is accomplished by providing sound results, detailed transcriptions, and an accurate discussion of the findings. Each interview was conducted via FaceTime, cellphone, or Zoom meetings while being recorded

simultaneously with the app Voice Memo on an iPhone and Mac BookPro Laptop using the Voice Record app. The individual transcriptions were transcribed and categorized in a similar method to ensure consistency. In addition, to make certain the interviews were uniform, I followed a scripted interview that asked each participant the same questions and allowed sufficient time for each participant to reflect and answer. Each portion of this research is replicable due to providing unambiguousness and transparency of each step completed during the individual phases of the study.

Dependability

Dependability is concerned with the consistency of the study; it asks the question, can this study be replicated in a like style by applying the same methods, questions, and participants in which the conclusions of the replicated study yield similar outcomes as the original study (Merriam & Grenier, 2019). This study provided dependability through the detailed documentation that began with the participants' interviews. I provided comprehensive accounts of my data collection, transcription of the recordings of the interviews, and the notes I made while transcribing the recordings and notes from my journal that included my thoughts on my experience and detailed steps I used to collect, organize, and analyze the data. The systematic and exhaustive review of the notes, transcriptions, and coding process reduced or curtailed researcher bias. It also provided a genuine and reliable picture of the data analysis process.

Confirmability

Confirmability is defined by Moser and Korstjens (2018) as the researcher's ability to remain objective while performing a research study. To ensure that I remained

as objective as possible, I took extraordinary steps to ensure the participants' views and perceptions were conveyed honestly and accurately. My personal opinions and beliefs were not included in this study. Triangulation of the data allowed me to ensure that any bias I had was minimized, which negated any doubt or uncertainty regarding the study (Patton, 2002; Shenton, 2004). I triangulated the data, which included the interview questions and participants' responses, transcript review, and a journal of my thoughts and beliefs of the interviews to help eliminate any bias within this study. This study presented an accurate view of the participants' perceptions and beliefs regarding the study's RQs.

Results

In this section I present the findings of this study concerning the RQs. The findings from the data analysis derived from the eight qualitative interviews led to six themes, which addressed the first RQ. The second RQ resulted in three themes. Two discrepant cases emerged. A detailed discussion of the themes and subthemes is provided below.

Research Question 1

The first RQ asked about parents' attitudes about the perceived usefulness of the iPad as an AAC for high school students with communication needs. The themes that emerged to address this question were (a) parents' beliefs that the iPad is empowering, (b) concerns for other children, (c) the iPad's usefulness, (d) other uses than AAC usage, (e) pros of using the iPad, and (f) cons of using the iPad. In this section, I discuss the themes that emerged for the first RQ.

Theme 1: Parents' Belief That iPad Is Empowering

The first theme to emerge was based on all eight participants' experience regarding their beliefs that the iPad empowered their children because it helped them communicate and gave their child a voice. For example, one participant stated, "it's just empowering, and it really does show you that these kids do have a lot to say and that they can be taught, and for my son, it wasn't natural." The participants discussed varying levels of their child's empowerment, as indicated in the comment that one mother stated she was "just happy that he could express himself," referring to her son, who has severe autism and was 100% non-verbal. This was also reflected in her comments about the iPad taking her son to the "next level" and has opened up a "world of possibilities" that was insufficient before adopting the iPad.

All eight participants felt that iPad had improved their child's communication skills and expressed this by using words such as "phenomenal, amazing, enjoyment," or phrases such as, "it took her to the next level, powerful to know he has a voice, it's fun, technology is the way to go, and it is empowering." Four out of eight participants stated they should have implemented the iPad sooner. In addition, seven of eight participants said the iPad had positively impacted their child's communication needs. However, one parent stated their child currently used the iPad as a back-up to her son's dedicated "talker." The participant stated they had previously used the iPad for her son's communication needs. Although they were happy with the results from its usage as an AAC, they felt the dedicated talker was better suited for their son's communication needs because he discovered the various things the iPad could do and stopped using it as the

AAC and used it for entertaining himself. Additionally, all eight participants believed the use of the iPad was empowering because it gave their child a voice. Furthermore, all participants reported that the iPad had improved their child's communication skills, and the iPad was an effective and efficient tool to use for their child's communication skills.

Theme 2: Concerns for Other Children

In examining the theme of *parents believes it is empowering*, I noted and additional themes that emerged important to the meaning of participant experiences. Five out of eight participants (63%) expressed their *concerns for other children*. The participants were vocal about the concerns for other children having access to AAC tools such as the iPad. One participant stated that children with speech-language impairments should have the same access to books, and she is a "strong" advocate in her home state because some children "do not have access to the same stuff that the general ED kids do." She also stated that children who had access to iPads being used as AAC gave children a "voice," with many options for children who are unable to speak because apps such as Proloq2Go used on the iPad are inexpensive and that when children receive the AAC devices. One participant stated the iPad allowed children to have choices about the books they read, and parents did not have to be concerned about viruses such as COVID-19 that might be transferred by other children.

In addition, the five participants believed the iPad being used as an AAC offered something for all children. These five believed the iPad is an inexpensive AAC, and anyone could use it. Half of the participants expressed that it was not very practical for children with speech-language impairments to use "low-tech" tools such as pointing, sign

language, or a stack of picture cards to use for their communication needs. P8 went further by stating that not all people knew sign language, but everybody understood her daughter when she used the iPad. Overall, the participants reported that children have a lot to say and that all children with speech-language impairments needed some type of AAC, including the iPad, to communicate.

Theme 3: The iPad's Usefulness

The third theme that emerged was parents' attitudes about *the iPad's usefulness*. All eight parents stated the iPad was useful for their child's communication needs. However, not all participants agreed it was the pinnacle for AAC devices. One of the participants initially used the iPad as her child's dedicated AAC but quickly found that the iPad's other uses were not conducive for her son's communication needs, although she stated it is useful as a backup to her son's dedicated talker. Also, another participant stated that she did not have any communication apps loaded onto her daughter's iPad for her communication needs because she did not know how to use the apps, but she found the iPad was useful as an AAC without using the apps. Seven of the eight parents believed the iPad provided many uses as an AAC for their child.

Seven participants stated they believed the iPad and its apps were an effective AAC and it was key to enhancing their child's skills and communication; they were happy their child could use it to communicate. Additionally, one participant stated she was thankful and happy that her child could express himself. Most participants (N=7) were grateful they implemented the iPad and its apps for their child's AAC usage, and four participants expressed they "wished" they had implemented it sooner. P8 reported

that the use of the iPad and its apps eliminated the use of several devices needed in different areas of school, and the iPad functions for all her child's school needs.

Upon further analysis of the theme regarding *parents' attitudes about the iPads' usefulness*, all participants expressed that the iPad was user-friendly and did not require much intervention for their child to begin using it as an AAC. Additionally, all agreed the iPad helped motivate their child with their communication learning, and they did not have to force their child to use it. P4 expressed this by stating the iPad motivated her child, and using it helped encourage her child to communicate. One participant summarized what parents believed about the usefulness of the iPad when she stated, "what I noticed about the usefulness of the iPad is that he was motivated by it. I mean, just as he was motivated for bubbles or a park, he was with the iPad, motivated with the iPad." This statement summed up the importance expressed by the participants.

Although the participants positively reported the iPad was user-friendly, enhanced communication skills, and helped keep their child motivated to use it, seven participants expressed there was a slight learning curve to using a newly implemented iPad. P8 stated she was concerned that the iPad could be used for other things; she found that setting up the Guided Access built into the Accessibility feature of the iPad eliminated those concerns. In addition, half (N=4) of the participants stated the iPad and its apps could be confusing to use when first learning to use it.

Theme 4: Other Uses Than AAC Usage

The theme *other uses than AAC usage* emerged from some of the responses to the usefulness of the iPad theme. Five participants allowed their child to use the iPad to play

music, play games, watch videos, attend classes or meetings, internet surfing, and shop. P3 stopped using the iPad as her child's dedicated AAC because there were too many other things for her child to do on it, which she claimed began affecting her child's behavior, and it was too much of a deterrent instead of it being a help. She removed the iPad and implemented another AAC to use as his dedicated device. Similar ideas were reported by P8, who set up the Guided Access on her daughter's iPad to ensure it is only used as an AAC. In addition, two of the participants believed it could be difficult to download music and videos.

Theme 5: Pros of Using the iPad

The third theme that emerged was parents' beliefs regarding the pros and cons of using the iPad. One pro that all eight participants agreed on was the cost of using the iPad and its apps because it is cheaper own and operate compared to other dedicates AACs. P8 compared the cost of repairing the iPad to the cost of repairing a dedicated device, and she stated it "every time she broke a device it was $1,000; every time she broke the iPad its $100." P6 stated that it was expensive to keep insurance on a dedicated device, and the devices were expensive to repair, such as a PRC, and it takes a long time to get it repaired. Still, replacing the iPad is less expensive than the expense of repairing the other AACs. Six participants stated they preferred the support offered for the iPad. Three participants stated their children carried the iPad around their neck and preferred it because it weighs less than other devices. All eight participants expressed similar opinions regarding the independence the iPad offered their children. P7 liked how it made work easier and was partial to using the iPad because it was innovative. P3 reinforced this

statement by declaring, “technology’s the way to go” and stated she liked that she could control what her child learns. Four participants stated they liked the iPad because it can help their children develop many skills and communicate better; it is convenient because it is mobile. According to P6, the iPad was “very easy to use, she is able to push the right buttons, she needs no help at all,” and her child could use it “sideways and upside down, backward.” P1 and P6 claimed there was “nothing” they did not like about the iPad. P1 also stated she has never used anything but the iPad and was not interested in using anything else.

Theme 6: Cons of Using the iPad

While participants identified many positive aspects of iPad usage, there were some areas over which they expressed concerns. Seven participants expressed concern over the safety of the iPad. For example, P3 stated that several people have tried to steal the iPad and the other device that her son uses. All eight participants expressed that the iPad is fragile and easy to damage when dropped or thrown by their child. In addition, all participants claimed they had to ensure the iPad was updated and maintained properly, which was challenging to do for some. Two participants reported the initial cost of the iPad was expensive but was not as costly as a dedicated device. One contrary statement reported by P3 regarding the use of the iPad was her son would use the iPad for everything but an AAC. P5 stated that it could be “frustrating to adjust” to use and that “ignorance” of it were factors that deterred her from using the iPad.

Research Question 2

The second RQ asked about parents' beliefs about the ease of use of the iPad and its apps for high school students with communication needs. There were three themes that emerged to answer the second RQ: (a) ease of use, (b) usage requires support from others, and (c) iPad versus other devices.

Theme 7: Ease of Use

The first dominant theme that emerged pertaining to the parents' beliefs about the iPad's ease of use was ease of use. All eight participants agreed that the iPad and its apps are easy to use and operate. P2 described it was easy for his son to navigate, chat or talk, and attend appointments and class while using the iPad. Seven participants described it as being easy to facilitate communication, being handy, and user friendly, as well as it provided many options. P8 indicated she should have been using it all the time, and P3 described its ease of use for her son as just pressing buttons, she stated: "I'm going to get this instead of stomping my foot or banging my head" because she can understand what her son is communicating. Seven participants also made similar comments regarding the iPad becoming easier to use the longer they use it. P6 summarized the consensus of seven participants by stating the iPad "became an extension of what we'd already been doing" because it was easy to use. Six participants believe the ease of use has helped their children progress with their communication skills. And the iPad's ease of use was summarized by P3, who stated its use has "opened up the world, so many words."

However, participants addressed some issues regarding its ease of use. For example, four participants reported their children did not have the manual dexterity to use

the iPad without someone assisting them. P6 reported that people "don't realize how much motor" skills they use because he had to make arrangements to ensure help was available because of his daughter's limited motor skills in using the iPad. Additionally, P6 stated that he believed his daughter's school opposed to letting her use the iPad because he believed they felt it was too difficult to use and did not know how to implement the iPad into his daughter's learning. P2 stated that his son was limited in operating the iPad because he has cerebral palsy. P8 also reported concerns for her daughter because she had "trouble with being able to isolate fingers." In addition, two participants claimed that some of the communication apps were difficult to learn and difficult to download.

Theme 8: Need for Support From Others

A theme that emerged from some of the responses related to the ease of use was that the *usage requires support from* others. Participants stated the iPad was easy to use, but they have to rely on others to help their children use it. P3 summarized the participants' thoughts regarding usage requires support from others to assist their children as they used the iPad as an AAC when she stated, "it takes a village." All eight participants expressed similar opinions about not teaching their child to use the iPad as an AAC device alone; it required many others outside their home to help, and they relied heavily on their families for in-home support. Two participants stated they had to ensure other family members were available to set up the child's iPad when the child needed or wanted to use it because they have physical limitations preventing them from fully operating it. Participant 1 stated that she depended upon her other children and extended

family to help teach her daughter to use the iPad for her communication needs. All 8 participants stated their children have received or were currently receiving support and/or interventions from school staff and teachers, AAC experts, speech-language therapists, physical therapists, occupational therapists, and ABA experts.

Theme 9: iPad Versus Other Devices

A final theme that emerged for the second RQ was the iPad versus other devices. Overall, seven of eight participants preferred the iPad over other AAC devices. P3 was the only parent who preferred a different dedicated device over the iPad and stated, "During the assessment they felt that that'd be the best" to use a dedicated talker. She decided the other device had more research available and felt this was better suited for her son's needs, but she does use the iPad if the other device needs repairs or is misplaced. P6 stated that his daughter used another AAC that followed the language acquisition motor planning (LAMP) device before the iPad. They used it only for a year, then switched to the iPad, which followed the LAMP protocol, and it was less expensive. P8's child used another device as an AAC and taught sign language, but she soon realized that her daughter could not do sign language because of her limited motor dexterity. She switched her daughter to the iPad mainly because it was less expensive to own, operate, and repair. Four participants have not used anything but the iPad as their child's dedicated AAC device after they graduated from using "low-tech" communication tools, such as picture cards or pointing.

Six of the eight participants reported negative thoughts regarding the low-tech communication tools. P3 stated that she thought the picture cards were not sustainable.

She believed it was too difficult for her child to use the picture cards to communicate because it would require him to sort through more than 100 cards to tell her that he was hungry and wanted an apple or cookie. P1, whose daughter has limited speech, stated her daughter had to point at the various pictures placed through her home to communicate her needs. Still, she liked the iPad better because it was easier for her daughter to use and easier for her to understand her daughter instead of trying to guess what her daughter was communicating. P6 stated the cards were not efficient and that his daughter's school still uses "other low tech methods," and that he stated it was "a very unpractical thing" for his daughter to carry "a bunch of cards" to sort through to communicate her needs or wants. P7 stated the cards were not easy to work with. P8 stated her daughter's motor skills were limited and "sign language was not working" because her daughter could not isolate her fingers. Two participants did not provide any information regarding the low-tech tools used by their children.

Discrepant Cases

Two discrepant cases emerged during the data analysis: (a) frustrations from various things and (b) hope. I discuss details related to both below. The discrepant case *frustrations from various things* emerged when participants claimed they had various frustrations regarding their child's school, properly maintaining the iPad and its apps, as well as frustrations with people trying to steal the device. One participant stated she was "continually" after the school regarding her child's use of an AAC, and the schools "were too worried about saying more bubbles and, blowing bubbles all day and eating breakfast than they were about teaching the kid where the first word." One participant stated that

some schools only let children use the school-owned iPad or any AAC device at school, and they have nothing to use at home. P6 stated he was concerned that his daughter's school only wanted to use low-tech and believed the school administration felt they would have to provide the iPad for his daughter. He stated he only wanted the school to help her with her communication skills by using the iPad he provided. He compared their usage of low-tech to a neighboring school system that was using different devices, but his daughter's school was opposed to change. He stated he blogged about his frustrations over this and could not understand why the school opposed his daughter using the iPad for her AAC device. However, he concluded that the school added some usage in his daughter's IEP at the beginning of the academic school year, 2021. Additionally, two participants expressed their frustrations with their child's progress because sometimes it was slow. Half of the participants claimed that people needed to be "constantly" educated on using the iPad as an AAC. Furthermore, five participants expressed frustration when the iPad broke because their child would throw or drop it. Three participants stated they had frustrations from always having to ensure their child had the device with them at all times; they had to maintain it and keep it charged. P2 stated that it could be frustrating to ensure someone was always available to help his son operate the iPad. P4 stated that it was frustrating if the electricity was out because the iPad was not usable without electricity because her Internet was dependent upon electricity.

The second discrepant case of *hope* emerged when participants expressed some form of hope, whether they had hope, were losing hope, or not having any hope. P3 stated

that she was hopeful that her son would learn to talk and believed the iPad helped him communicate because he had a lot to say, but "not the way we interact."

Four participants expressed they had hoped their child would learn to communicate once they implemented the iPad and were hopeful that implementing the iPad as an AAC would help speed up their child's communication. P2 stated, "I'm sure it's making an impact," in what he can understand. Three participants stated they were hopeful their child would be able to communicate even though their children were completely non-verbal. An example of this was expressed by one participant who stated that his child was "pretty adept about expressing" herself with the iPad, and it seemed to be getting easier the more she used it. P6 expressed that he had hoped that his daughter's school would continue to cooperate by allowing her to use the iPad as her primary AAC device.

Some participants expressed little to no hope because they realized that communication for their child was dependent on people or things that were barriers to their child's communication learning. P3 expressed this by stating that an Applied Behavior Analysis provider told her that her son would never talk and he would not learn to talk. She stated she realized "his brain is just not getting the words out the way we do," and this could not be changed, which made her sad. P6 stated his daughter was completely non-verbal from birth and that he had little hope that his daughter's school would allow her to use her device because "they are resistant to using any kind of a device" even though the "AAC is part of their requirements" and he has had "very little luck" getting the school to allow his daughter to use it. Two of the participants expressed

they had faltering hope about their child being able to operate the iPad because of physical limitations that prevent them from operating it independently.

Summary

In this chapter, I presented a detailed discussion of the participants, setting, data collection, and analysis process. I also included a discussion of the evidence of trustworthiness and the study's findings. The eight qualitative interviews resulted in the emergence of six themes for the first RQ, seeking answers regarding parents' attitudes about the perceived usefulness of the iPad as an AAC. The second RQ sought answers to parents' beliefs about the ease of use of the iPad and its apps while their students use it to assist with their communication needs. The data analysis from this RQ resulted in the emergence of three themes. Two discrepant cases emerged related to frustrations and hope. In Chapter 5 I provide an interpretation of the findings and a discussion about the limitations of the study. There is also a discussion of recommendations for further research and the study's implications for positive social change and implications for the practice.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this generic qualitative study was to examine parents' attitudes and beliefs about the adoption and ease of use of the iPad and its apps as an AAC to meet students' communication needs. I conducted the study to address the perspectives of parents, a key stakeholder group, on the use of the iPad for student language learning. In Chapter 4, I reviewed the data collection and presented the findings from the qualitative interviews I conducted with eight participants. In Chapter 5, I further interpret this study's findings and provide a detailed discussion of this study's limitations, recommendations, and implications. Chapter 5 also includes a conclusion to the study that provides a detailed discussion, including the participants' beliefs that the iPad and its apps positively affected their child's communication needs and that it enhances their children's vocabulary. Participants also believed it takes others to support their children while using the iPad. In the conclusions, I also discuss the participant's beliefs about the iPad being easy to use. They also expressed frustrations with schools because they believed schools presented barriers in helping their children communicate with the iPad. They expressed concerns regarding their children's physical barriers while using the iPad.

Interpretation of the Findings

The purpose of this generic qualitative study was to examine parents' attitudes and beliefs about the adoption and ease of use of the iPad and its apps as an AAC to meet students' communication needs. This study helps to close the gap in the literature regarding parent stakeholders' attitudes and beliefs regarding the iPad as an AAC by high

school students. In this section, I discuss the findings that emerged from the data analysis. First, I discuss the findings in relation to the TAM conceptual framework. Then, I interpret the findings in relation the key study variables, thus confirming, disconfirming, or extending the findings based on the literature.

Interpretation of the Findings Based on the Conceptual Framework

The conceptual framework for this study was the TAM. The TAM has two elements, which are the perceived usefulness of the technology and the technology's perceived ease of use. The themes that emerged from the two RQs addressed the participants' attitudes about the perceived usefulness of the iPad as an AAC and their beliefs about the ease of use of the iPad and its apps while their children use it as an AAC for their communication needs.

Research Question 1

RQ1: What are parents' attitudes about the perceived usefulness of the iPad as an AAC for high school students with communication needs?

While reviewing the literature relating to the TAM, I found that the attitudes of parents of high school students who have speech-language impairments were often overlooked, specifically regarding the perceived usefulness of the iPad as an AAC for students' speech-language communication needs. The TAM defines the element of perceived usefulness as how the users believe the technology will help them complete their endeavor (Davis et al., 1989). In their interviews, all eight participants provided insight regarding the iPad's usefulness to their children.

The participants' responses support the use of the TAM as the study's conceptual framework. All eight participants said that they believed that the implementation of the iPad as an AAC was empowering and gave their child a voice. They said that it had improved their child's communication skills. These findings are consistent with Diop et al.'s (2019) argument that the TAM offers a framework for explaining why users accept technology. Additionally, one participant claimed that the iPad was empowering but used another device for her son's communication needs. She initially implemented the iPad as a dedicated device for her son's speech-language communication needs but quickly replaced it with a different dedicated talker. This finding aligns with Buchanan et al.'s (2013) and Tsai et al.'s (2017) arguments that the TAM is useful for examining why people prefer one technology over another.

Participants also shared their attitudes towards the iPad's usefulness as an AAC. All eight participants had positive thoughts regarding the usefulness of the iPad. Seven participants said they believed the device was useful as an AAC because it enhanced their child's communication skills as they used it to communicate. Furthermore, one participant stated that it was useful even though she only allowed her son to use it as a backup to his dedicated talker. Moreover, five participants felt so strongly about their child using the iPad as a dedicated device that they expressed concerns for other children needing access to the device. The five participants said they believed the iPad was a helpful tool AAC that was suitable for all children because anyone could use it, and it is an affordable AAC. These findings align with Smeda et al. (2018), who stated that the TAM can predict and explain why technology is adopted. Additionally, the findings align

with Bagozzi et al.'s (1992) argument that users' attitudes are reasons for adopting the technology and their beliefs about technology leading to its adoption. In addition, four participants stated that they wished they had implemented the iPad sooner for their child's communication needs. This finding supports Luijkx et al.'s (2015) claim that children influence parents' decisions to adopt technology when they see the children using it.

Participants provided data regarding the pros and cons of the usefulness of the iPad. All participants stated that they found the iPad useful because it was easy to maintain, mobile, and not expensive to use. Additionally, they stated that it provided independence for their child, and some said that it was useful because it improved their child's communication skills. Two participants stated that there was no aspect of the device that was not useful. These findings are supported by Tsai et al. (2016), who argued that perceived ease of use of technology has definite advantages that influence the perceived usefulness and that technologies' advantages embellish the ease of use.

Research Question 2

RQ2: What are parents' beliefs about the ease of use of the iPad and its apps for high school students with communication needs?

In reviewing the literature on the TAM, I found few studies of parental beliefs about the iPads' ease of use. However, while analyzing the data collected during the qualitative interviews, I found that parents had much to say about the ease of use of the iPad and its apps as an AAC for their children. The second element that the TAM is based on is the perceived ease of use. The TAM was helpful in examining the beliefs that

participants had regarding the iPad's ease of use because the iPad may be perceived as being useful; however, if the iPad is perceived as being difficult to use or involves very much work to acquire the skills or the know-how to use it, the user could abandon it (Davis et al., 1989).

All eight participants stated that the iPad and its apps were easy to use and operate. The findings illustrated that all participants had positive beliefs that the iPad simplified ease of communication because it was user-friendly and offered many options. Additionally, some participants stated that the iPad was useful in keeping their children motivated to learn, and they did not have to force the children to use it. In addition, participants expressed some hope because they believed the iPad's ease of use offered a tool that could help their child to communicate. According to parents, their children experienced rapid results with improvement in their communication skills. In addition, some participants expressed that they had little to no hope because of various barriers—barriers that were related to the physical or mental limitations that their child has, and barriers that were created by others such as school. These findings are consistent with Smeda et al. (2018) and Venkatesh and Davis (1996), who claimed that attitudes toward technology directly affect the users' beliefs regarding its ease of use. In addition, the findings are in alignment with Johnson and Howard's (2019) finding that beliefs regarding the ease of use helped keep users motivated when using the iPad mini with preloaded apps.

However, a few participants in this study did not consider the iPad easy to use by their children because of the children's motor skill limitations. One participant stopped

having her child use the iPad altogether because her child easily figured out the other features it offered and wanted to play on it rather than use the device as his dedicated AAC device. Although these findings are negative regarding the iPad's ease of use, they are supported by Tsai et al. (2016), who claimed that perceived ease of use has definite qualities that affect the perceived usefulness of technology. These qualities, in turn, influence the users' belief regarding its ease of use. Furthermore, this is also supported by Huntington and Worrell (2013), Smeda et al. (2018), and Zhao et al. (2018), who argued that the TAM could be used to explain why some adopt certain technologies and why others reject the iPad.

Interpretation of the Findings Based on the Key Variables and Concepts

In this section, I discuss the interpretations of the findings based upon the key variables and concepts.

Use of the iPad As an AAC for Speech-Language Impairments

The use of the iPad as an AAC for speech-language impairments was a key variable used in the literature review of this study. Eight participants stated that the iPad was easy to use as an AAC and did not require much intervention or support for their child to use. Seven of the eight participants expressed that the device was effective as an AAC, but there was a learning curve to implementing it. Also, all eight claimed that the iPad helped keep their child motivated to use it for their speech-language needs. Additionally, all eight revealed that they liked the independence the iPad provided their children. All participants said the iPad was fragile and needed to be placed in a sturdy case to protect it when dropped or thrown. One participant stated that three people tried to

steal her nonverbal child's device, and she had to be proactive to prevent it from happening again. Furthermore, three participants believed that the iPad enhances their children's vocabulary and spelling, and they claimed their children can grasp more complex words with the help of the iPad. These findings are similar to DeCarlo et al.'s (2019) finding that a parent's attitude about technology such as the iPad as an AAC directly affects learners' success or failure. In addition, my study's findings were similar to those of D'Agostino et al. (2016) that understanding the user's beliefs regarding the usefulness of the iPad is vital. Their results revealed that students using the iPad were heavily involved with their learning. Additionally, D'Agostino et al. upheld that there was something fundamentally useful about the iPad being used in learning.

Additionally, the findings revealed five of the eight participants allowed their children to use the iPad for playing music and games, internet surfing, watching videos and sports, attending meetings and school, shopping, drawing, file storage, calendar, and reading. However, one participant removed the iPad as her child's dedicated device because the child wanted to use it for everything but an AAC. And these participants claimed that maintaining the devices could be challenging, and the start-up cost could be expensive but not as expensive as other AAC devices. Additionally, half of the participants had to have someone available to support their child because they could not operate the iPad due to manual dexterity limitations. de Jong et al.'s (2010) study was similar to these findings because it explored the effects technology, such as the iPad, had on student performance. In addition, King et al.'s (2017) study claimed that understanding barriers such as the physical limitations that users have while using tablet

technology such as the iPad was vital because it impacts all areas of education and can add value to learning.

Use of the iPad As an AAC for Communication Needs

While examining the literature for this study, a second common theme was revealed that indicated a colossal need for practitioners to gain a deep understanding regarding the use of the iPad as an AAC for communication needs. All eight participants claimed the iPad had a positive effect on their child's communication needs; these children have a lot going on in their heads and have a "lot to say." Furthermore, the participants who had non-verbal children hoped that implementing the iPad as an AAC would help their children's communication needs by improving their communications skills. The participants believed the iPad and its apps were making an impact on their children's communication. Participants also expressed little to no hope because people and things were barriers to their children's communication needs. The participants described the barriers as children having physical limitations that prevent them from operating the iPad by themselves. Barriers included experts saying they would never talk, teachers who wanted the children to keep using the low-tech cards with words and pictures for communicating, or people who tried to steal their device. P3 summarized the participants' thoughts on the people who create barriers as "we do have to constantly educate people" that these children can communicate, but "not how we interact." These findings were similar to King et al. (2017), Pandya et al. (2016), Murdock et al. (2013), and Baker (2017), whose studies looked at the usefulness of the iPad and its apps being used as an AAC with students who have communications needs. All studies stated that

the iPad and its apps being used as an AAC by different users positively impacted the users' communication skills.

In addition, the findings revealed it took more than just the participants to support their children using the iPad as an AAC. For example, Participant 3 has a team of Speech-Language Experts and specialists, along with teachers and extended family helping her son with his communication needs. All participants agreed they relied upon others to help their children. These findings are similar to the finding of Chang and Wang (2018), Kent-Walsh et al. (2015), and Waddington et al. (2017), who used various communication partners to determine if various partners in different situations and environments had an impact on students using tablet technology for their communication needs. Waddington et al.'s study had successful outcomes from interventions with 80 percent accuracy. Chang and Wang (2018) claimed student requests were more accurate, and their peers started mimicking the study's participants. Kent-Walsh et al.(2015) claimed their study's intervention had long lasting effects on their participants.

Traditional Versus Nontraditional Devices

A third key variable discussed in Chapter 2's literature was the traditional vs. nontraditional devices. The findings of this study revealed that all eight participants believed the "nontraditional" devices such as the iPad was better suited for their children's communication needs, with seven of the eight using the iPad and one participant using the PRC as their children's dedicated AAC device. The findings revealed that most participants (n=6) felt that traditional devices such as pictures and cards with words were not practical. They did not believe their children could

communicate effectively with the traditional AACs. These findings were similar to Hill and Flores' (2014) and Jimenez and Stanger's (2017) study that revealed that student communication is not hindered when the iPad is used. Using nontraditional devices such as the iPad is a sensible device because it helps improve their development of communication skills.

Furthermore, all the participants stated that their children's communication skills had improved with implementing the non-traditional device, regardless of whether it was an iPad or PRC. The finding also revealed that participants liked the device's mobility and felt that use of the device gave their children some freedoms that they did not have with traditional devices. These findings are similar to the findings of Alzrayer et al. (2014), who claimed that the iPad had a positive effect on their participants' communication skills; and Bean et al.'s (2019) paper that asserted that AAC devices such as the iPad has the potential to increase communication skills of the user. Additionally, these findings align with Krivoruchko et al. (2015), who claimed that using non-traditional AAC devices optimizes the learning process, provides easy access to school work, and provides users with freedom because non-traditional devices are mobile.

Discrepant Case 1: Frustrations

Frustrations were reported by several (n= 4) of the participants that their children's schools would not let the child have access to the AAC device that was not "traditional" because participants believed the schools were resistant to change and preferred conventional communication devices. These findings are supported by Young (2016), who claimed that school staff and faculty could prevent students from using the

iPad and its apps because there are concerns regarding their concern for changing classroom practice and a lack of confidence in faculty knowing how to adapt it into the classroom appropriately. Other frustrations reported by participants had to do with participants providing additional support to help their children who had physical impairments that limited them from using the iPad. This finding is supported by Jimenez and Stanger's (2017) study that investigated barriers to students with physical impairments needing teacher support to assist with learning math. The researchers claimed the study revealed that it is essential to recognize and address ways for all students to participate in learning. Without it, some students do not have access due to their physical limitations. Another frustration reported by participants as it was challenging to maintain the up-keep of the AAC device due to constant changes in the technology, expenses for repairing it, and the time it takes to learn to use new apps and general maintenance such as charging it, ensuring the child has it with them all the time, and keep it safe. These findings are similar to findings reported by McNaughton and Light (2013), who argued interventions must be provided to the communication partners to ensure they can successfully support the person using the AAC.

Discrepant Case 2: Hope

The second discrepant case revealed in findings was hope when participants reported they had some type of hope, whether they had hope, were losing hope, or did not have any hope. Four participants reported that implementing the iPad would help their children communicate. Three participants stated they were hopeful their completely non-verbal child would communicate with the help of the iPad. These findings are supported

by Allen et al. (2015). Their study revealed that the iPad might influence learning in children with ASD because it reduces stress created in the environment and allows the learner's cognitive capabilities to be committed to learning. However, some participants reported little hope because they realized that communication for their child was dependent on people or things that were barriers to their child's communication learning. In contrast, other participants claimed they had faltering hope about their child operating the iPad because of physical limitations that prevent them from operating it without someone supporting them. These findings are similar to Wendt et al.'s (2019) study. The researchers investigated the usefulness of the iPad as a speech-generating device and revealed that some vocalization during the baseline increased one participant's spoken words. Still, two other participants who were utterly non-verbal did not develop spoken words during their study. The researchers claim that the study's findings provided evidence that although some participants did not develop spoken words after receiving AAC intervention, the interventions did not stop language development either.

Limitations of the Study

The purpose of this study was to examine parents' attitudes regarding the adoption of the iPad and its apps as an AAC and their beliefs regarding the ease of use of the iPad and its apps as it is used as an AAC by their high school students who have communication needs. After joining 34 Facebook groups and sending out 89 private messages to parents within these groups, I recruited eight participants to interview for this study. This study was limited to parents of high school students who have communication needs, and it did not focus on any other group. According to Yin (2018), it is difficult to

generalize the finding of a study to other populations because it is limited to its uniqueness. Since only a small number of participants were interviewed, it made the findings unique to this study. I was contacted by a few additional participants, who had the same speech and mannerisms as three other previously interviewed participants. This immediately caused me to think that these five individuals were the same person. Upon a lengthy discussion with my dissertation chair, I declined their requests to participate. Additionally, the three participants I was suspicious of being the same individual created some researcher bias, and I address this severe limitation below.

As a strenuous effort to reduce researcher bias, I took extraordinary steps to eliminate it. Since I was the only person who collected and analyzed the data, I used an audit trail, reported the discrepant cases, and used triangulation of the data that included allowing the participants to review their interview transcripts. I reflected upon my notes that were extensive to eliminate my bias. I also conducted a thorough, systematic, and exhaustive review of the notes, transcriptions, and coding process, which helped reduce and curtail the bias (Merriam & Grenier, 2019). Regarding the three participants, I was suspicious of being the same person; I searched myself and discussed this situation at length with my dissertation chair. On several occasions, I reviewed my telephone logs, listened to the interviews' recordings, re-read the interview transcripts, and noted where my suspicions lay. This extensive review of the interview recordings and transcripts led me to believe that there was no possible way to prove or disprove my thoughts. According to Moser and Korstjens (2018), the researcher must remain as objective as possible while conducting a study to report the data obtained from the study accurately.

The above steps were taken to ensure my study was dependable and plausible. In conclusion, I had to take the data as it was and report my findings as such.

Furthermore, the generalization of this study rests upon transferability, which was another limitation of this study (Carminati, 2018). Although this study provide thick descriptions of the participants' conduct and experiences that might be viewed as meaningful to readers of the study, it is limited to readers who are investigating the use of the iPad and its apps as an AAC, using iPad technology in special education, and using the iPad technology for speech and language communication tools (Korstjens & Moser, 2018). Additionally, Elo et al. (2014) argued that a qualitative study's transferability might not occur if the reader cannot connect the findings of a study to their particular need.

Recommendations

The findings from this study revealed the attitudes parents' had regarding the adoption of the iPad and its apps as an AAC and their beliefs regarding the ease of use of the iPad and its apps as it was used as an AAC by their high school students with communication needs. This study was conducted during the COVID-19 pandemic, and it should be recreated to see if the participants would report findings contrary to this study's findings. Additionally, this study revealed that parents allowed their children to use the iPad for other things outside the perimeters of a dedicated AAC. A recommendation for future research should include investigating parents' attitudes towards the iPad and its apps being used as an AAC, but their high school children use it for everything but an AAC. This study's participants included two fathers; I recommend future studies involve

more male participants, specifically investigating fathers of male students who use the iPad and its apps as an AAC. Additionally, researchers of future studies should replicate this study but streamline the RQs to get a better understanding of parents' attitudes regarding the implementation of the iPad as an AAC in high school students who have communications needs that are caused by specific mental or physical limitations, such as Autism, cerebral palsy or deafness. Another recommendation for future studies is focusing only on the parent's beliefs regarding the ease of using the iPad and its apps while their high school student uses it as an AAC. I also recommend that researchers further elaborate on the application of the TAM as the conceptual framework to gain a deeper understanding of technology adoption.

Future studies should also investigate if the iPad and its apps being used as an AAC help improve their children's communication skills while they are using it as an AAC. Other studies should compare traditional (conventional) devices and non-traditional devices, such as the iPad and its apps being used as an AAC. Future studies should also consider using AAC apps designed to report user progress to various stakeholders such as parents, teachers, and speech-language therapists, which might help children with speech-language needs, and it might improve the adults' understanding of what technology can contribute to various interventions. Future studies might also investigate why parents become frustrated with schools when parents want to provide the iPad, and its apps as their child's dedicated AAC device and schools oppose it. Additionally, researchers should also look at what causes parents to have hope, lose hope,

and have not any hope when implementing the iPad and its apps as an AAC for their non-verbal children's speech-language communication needs.

Implications

This study could affect other families considering implementing the iPad and its apps as an AAC by showing that parents who currently implement it as an AAC understand the pros and cons of implementing it into their children's communication needs for everyday practices. In addition, this study could help educators understand that implementing the iPad and listening to the parents who believe the iPad does increase students' learning abilities and skills, and that low-tech is not parent's preferred method for their child to communicate, and parents are willing to ensure their child has the right tools to use for their communication needs. By understanding the parent stakeholders' attitudes and beliefs, the educational systems should tailor the iPad and its apps as an AAC to appeal to the students' parents, who are significant contributors to their student's communication needs. The findings from this study offer a foundation upon which other research could be developed on ways to implement the iPad into other areas of education. This study could help educators within speech and language pathology who want to help students of all ages obtain more profound communication skills. The findings of this study provided ideas that may help improve the learning conditions for students enrolled in speech-language special education classrooms who have speech impairments of differing severity and type. This study shed light on how the iPad provided high school children an electronic voice, and it showed how parents believed it was enhancing their children's communication skills. Furthermore, anyone who has an interest in learning

about the adoption of the iPad into the speech-language educational system outside the classroom may benefit from the findings of this study because it provides some insight into the attitudes and beliefs that parents have about the iPad being used as an AAC tool for students communication needs in high school Grades 9 through 12.

Conclusion

Conducting this generic qualitative study was a very tedious effort that presented numerous mountains to climb, but it fed a few passions at the same time. The findings of this study were based upon and interpreted from a TAM conceptual framework view. The study findings were consistent with the literature presented in Chapter 2. This study provided recommendations for future studies regarding parents' perceptions about implementing the iPad and its apps and parents' beliefs regarding its ease of use while being used as an AAC by their high school children with communication needs. The findings of this study confirmed what I believed regarding the iPad being used as an AAC and how my passion as an educator believes that all children can learn and learn to the best of their abilities when provided with the appropriate tools. It also fed the mother in me, who wants all children to communicate and learn and believe that they should be afforded the same opportunities as their peers. My biggest passion fed by this study confirmed my belief that the iPad and its apps provide an electronic voice to children who cannot convey their thoughts and expressions effectively without it.

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Appendix A: Permission to Use Technology Acceptance Model Image (Figure 1)

Fw: Permission to Use an Image of TAM (1986)

Sarah King <sarah.king@waldenu.edu>
Wed 10/14/2020 12:50 PM
To: sarah.king.7@us.af.mil <sarah.king.7@us.af.mil>

From: Davis, Fred <Fred.Davis@ttu.edu>
Sent: Tuesday, September 1, 2020 9:40 PM
To: Sarah King <sarah.king@waldenu.edu>
Cc: Rob R. Foshay <wellesley.foshay@mail.waldenu.edu>
Subject: RE: Permission to Use an Image of TAM (1986)

Sarah,
It would be fine with me if you used that image. You have my permission to use it. I appreciate your asking.
Best wishes

Fred Davis

From: Sarah King <sarah.king@waldenu.edu>
Sent: Tuesday, September 1, 2020 10:02 AM
To: Davis, Fred <Fred.Davis@ttu.edu>
Cc: Rob R. Foshay <wellesley.foshay@mail.waldenu.edu>
Subject: Permission to Use an Image of TAM (1986)

Good morning, Dr. Davis,

My name is Sarah King and I am a PhD Candidate at Walden University. I am using the TAM as the conceptual framework for my dissertation, and I would like to have permission to use one of the images that is presented in your dissertation: *A Technology Acceptance Model for Empirically Testing New End-User Information Systems: Theory and Results* (1986). The image is located on page 24 and is titled: Figure 1 *Technology Acceptance Model.*

Please let me know if you need any more information regarding me using this image.

Sarah King
PhD Candidate
Walden University

Appendix B: Permission to Use Technology Acceptance Model Image (Figure 2)

FW: Requesting Permission to use Image

Landrum, Vivian <vlandrum@bauer.uh.edu>
Wed 10/14/2020 6:00 PM
To: Sarah King <sarah.king@waldenu.edu>
Cc: info@decisionsciences.org <info@decisionsciences.org>

Dear Sarah,
You may use the image as long as you clearly give credit to where the image came from – journal, Vol, Issue, title author, etc. that you noted below.

Best,
Vivian

Vivian Landrum
Executive Director
Decision Sciences Institute (DSI)
C.T. Bauer College of Business
University of Houston
4750 Calhoun Road, Room 325A
Houston, TX 77204-6021
713.743.4893
vlandrum@bauer.uh.edu
decisionsciences.org

From: Sarah King [mailto:sarah.king@waldenu.edu]
Sent: Wednesday, October 14, 2020 11:40 AM
To: info@decisionsciences.org
Cc: Rob R. Foshay <wellesley.foshay@mail.waldenu.edu>
Subject: Requesting Permission to use Image

Good morning,

I am Sarah King, and I'm a Walden University Ph.D. candidate and currently I am writing my dissertation proposal. I would like to obtain permission to use an image titled Figure 1: *Technology Acceptance Model* that appeared in Decision Sciences, Vol. 27, Issue. 3 on page 453. In the article: Venkatesh, V., & Davis, F. D. (1996). A model of the antecedents of perceived ease of use: Development and test.
You may reach me at this email address or via cellphone, [redacted] if you need further information or clarification.

Sincerely,

Sarah King

Appendix C: Invitation Letter to Participants

I hope that all is well with you. I am a Ph.D. candidate at the Walden University working on completing my dissertation. As part of my dissertation, I am conducting a generic qualitative study that is seeking to answer questions about the attitudes parents have regarding the perceived ease of use of the iPad and its apps as an AAC and their beliefs regarding the ease of use of the iPad and its apps as it is used as an AAC by their high school students in high school grades 9 through 12, who have communication needs. Communication needs are defined as any deficiency, mild to severe that prohibits or prevents an individual from understanding and/or expressing their "needs, wants, feelings, and preferences", or their ability to transfer information and ideas, and requires the use of an AAC device to assist them with modified "movements, gestures, objects, vocalizations, verbalizations, signs, pictures, symbols, printed words" (American Speech-Language-Hearing Association, 2021).

Would you be interested in assisting?

Please let me know if you would like to participate.

You can contact me by phone at [redacted] or e-mail at sarah.king@waldenu.edu, if you have any questions.

Appendix D: Recruitment Flyer

WANTED:
Parents & Caregivers

Are you the parent or caregiver of high school students in grades 9 through 12, who have communication needs and use the iPad and its apps as an AAC for their communication needs?

You are invited to take part in an interview for a research study that is seeking to answers to questions about the attitudes and beliefs parents have regarding the iPad and its apps as an AAC as it is used by your high school students.

Please consider participating in this study.
You will receive a $10.00 Walmart eGift Card upon completion of the interview.

Participants will be asked to complete the following activity:

One interview lasting approximately 45-60 minutes – either by phone, Zoom, FaceTime, or Skype.

If you are interested in participating, need more information or have questions, please email: sarah.king@waldenu.edu

This study has been approved by the Institutional Review Board of Walden University IRB#04-22-21-0418372

Appendix E: Interview Questions

Demographic Questions

1. Please tell me your experiences with your child's communication needs.
2. How old was your child when you discovered they had communication needs?
3. Who discovered the communication impairments?
4. What type(s) of treatment(s) has your child for their communication needs?
5. What is your perception of your child's communication skills before they began using the iPad and its apps as a language learning tool?

RQ1. What are parents' attitudes about the perceived usefulness of the iPad as an AAC for high school students with communication needs?

1. What did you believe about the usefulness of the iPad before it was implemented into your child's communication learning needs?
2. How do you feel about your child using the iPad and its apps as an AAC for their communication needs?
3. What factors may have influenced your decision to use it as an AAC for your child's communication needs?
4. What factors may have deterred your decision not to use it as an AAC for your child's communication needs?
5. What was/were the deciding factor/factors for using the iPad that led you to adopt it as an AAC for you?
6. What do you find useful regarding the iPad and its apps as your child uses it as an AAC?

7. What do you find difficult regarding the usefulness of the iPad and its apps as your child uses it as an AAC?

RQ2. What are parents' beliefs about the ease of use of the iPad and its apps as an AAC for high school students with communication needs?

1. What do you think about the ease of use the iPad might offer your child as a communication tool?
2. What other communication tools has your child used for communicating?
3. What do you think about the iPad's and its apps ease of use?
4. What do you like best about the iPad and its ease of use while your child uses it as an AAC?
5. What do you like least regarding the iPad and its ease of use while your child uses it as an AAC?
6. How do the iPad and its apps ease of use compare to other communication tools used by your child?
7. How do the iPad and its apps ease of use differ when compared to other communication tools used by your child?

Appendix F: Interview Script

Opening script:

Thank you for agreeing to participate in this interview. The interview should last approximately 30 to 45 minutes. Do you mind if I audio record the interview? [Wait for response] [Inform participant that you will begin recording if the participant agrees.] I will be using two devices to record the interview to ensure that your responses are captured accurately. I will also be writing down your responses as we move through the interview. I will begin the interview by asking some demographic questions, and then I will progress to the interview questions that pertain to my study's topic. If you need clarity on any question or you need to take some time to think about any question, please feel free to let me know. I will also give you a copy of the interview questions. Do you have any questions or concerns before we begin? Are you ready to start the interview? [Wait for their response.] Let's begin.

Demographic questions:

1. Please tell me your experiences with your child's communication needs.
2. How old was your child when you discovered they had communication needs?
3. Who discovered the communication impairments?
4. What type(s) of treatment(s) has your child for their communication needs?
5. What is your perception of your child's communication skills before they began using the iPad and its apps as a language learning tool?

Interview questions:

These questions pertain to what are your attitudes about the perceived usefulness of the iPad as an AAC as your child uses it for their communication needs?

1. What did you know about the usefulness of the iPad before the iPad before it was implemented into your child's communication learning needs?
2. How do you feel about your child using the iPad and its apps as an AAC for their communication needs?
3. What factors may have influenced your decision to use the iPad and its apps as an AAC for your child's communication needs?
4. What factors may have deterred your decision to not use the iPad and its apps as an AAC for your child's communication needs?
5. What was/were the deciding factor/factors for using the iPad and its apps as an AAC for you?
6. What do you find useful regarding the iPad and its apps as your child uses it as an AAC?
7. What do you find difficult regarding the use of the iPad and its apps as your child uses it as an AAC?

These questions pertain to what are your beliefs about the ease of use of the iPad and its apps while your child uses it to assist with their communication needs?

1. What do you think about the ease of use the iPad might offer your child as a communication tool?
2. What other communication tools has your child used for communicating?

3. What do you think about the iPad's and its apps ease of use?
4. What do you like best about the iPad and its apps being used as an AAC?
5. What do you like least about the iPad and its apps being used as an AAC?
6. How does the iPad and its apps ease of use compare to other communication tools used by your child?
7. Which of the communication tools used by your child do you believe has been easiest to use? Why?

Closing script:

That completes the interview. I will email you a copy of your interview to review for accuracy within the next two weeks. You will be receiving an email from my waldenu.edu email address with a transcription of your interview. Please read and reflect on the transcription and send any corrections or comments about the transcription to me within two weeks. If you wish to remove yourself from this voluntary study, you can indicate this at any time. Do you have any questions? [Wait for their response.] Thank you for your help and time, and have a nice day.

Appendix G: Sample of the Various Colors Used for Individual Reviews of Data