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ABSTRACT

I focused this dissertation on what is happening within schools regarding iPad usage and students with disabilities. Technology usage is thought to help provide students with another modality for learning the curriculum. iPads, specifically, are leading the technological revolution in classroom environments. One benefit of iPads in instruction is that they assist all students, especially those with disabilities by helping them complete a task with increased ease. The focus of this research was to study the usage of iPads in K-6th educational settings with students with low incidence disabilities. Technology usage among students with disabilities continues to rise, yet teachers are still unsure as to whether or not their technology integration is meaningful. I found that teachers had strong intentions to integrate iPads with students with disabilities, but oftentimes their teaching practices did not promote the usage of the devices.

This study utilized a qualitative approach including semi-structured interviews, observations, and document analysis. I used these approaches to understand the following questions:

1. In what ways are iPads used in inclusive classrooms to support the needs of students with low incidence disabilities?
2. What are the iPad integration practices of teachers with students with low incidence disabilities?

I conducted semi-structured interviews with teacher teams to see how teachers and other school personnel integrated iPads into their inclusive general education classrooms. I interviewed student users and one parent to gather their perspectives and perceptions on the usage of the iPads. I used observations as a method to gather data on the usage of

iPads to meet the needs of the user and to understand how the teachers integrated iPads into the curriculum. I completed document analyses of student IEPs (Individualized Education Programs) to understand the goals and needs of the student in comparison to their instruction.

USE AND INTEGRATION OF IPADS WITH STUDENTS WITH LOW INCIDENCE
DISABILITIES IN ELEMENTARY SCHOOLS

by

Katie Heath

B.S., St. John Fisher College, 2007

M.S., Keuka College, 2012

Dissertation

Submitted in partial fulfillment of the requirements for the degree of Doctor of
Philosophy in Teaching and Curriculum

Syracuse University

June 2018

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My first acknowledgment goes to the teachers, parents, and student participants in my study. Without their support and the support of their schools, there would be no data to report. The participant teachers' commitment and dedication to the teaching field allowed me to reflect back on my years as an elementary classroom teacher.

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CHAPTER ONE: INTRODUCTION

My Personal Story

During one of my qualitative courses, I had to complete observations and write field notes about a special area of interest. I decided to review the usage of iPads with students with disabilities in the classroom. Mobile technology always sparked my curiosity. I saw the benefits of using these devices on a regular basis with my students. Unfortunately, my experiences with integrating iPads into the classroom did not include students with disabilities; thereby yielding no evidence of how they utilized these devices in the classroom. Thus, I entered that project without first-hand experience in using iPads with students with disabilities. I had worked for years as an elementary teacher and was excited to learn about using iPads with students with disabilities. The resulting research for this course became the beginnings of my dissertation. I felt that it was imperative to see how teachers used iPads with students with disabilities.

By working in the teaching field, I had accumulated multiple contacts and found a teacher in a local school district that was a big proponent of incorporating iPads into her classroom. I approached her about observing her class, and she welcomed me with open arms and enthusiasm. Mrs. Carol (pseudonym) accepted me into her classroom to observe a third grader named Jimmy (pseudonym). I previously observed her class, and this time I was excited to see Jimmy and his iPad usage. When I arrived at the small, close-knit, kindergarten-fifth-grade school, the secretary and Mrs. Carol greeted me. We walked together to her classroom, which was in the far corner of the school, right next to the special education classroom. Since I arrived prior to the start of the day, Mrs. Carol and I had a chance to sit and discuss the observation. We began by talking about how

she used assistive technology (AT) in her classroom. She explained that she used AT with one little boy who has Cerebral Palsy and used a wheelchair. She explained that he mainly used the iPad for socialization purposes; he used the iPad to communicate. As we continued our conversation, the students started to arrive. As I observed, I saw no socialization between Jimmy and the other students in the classroom. The only people that interacted with him were his paraprofessional and his teacher. At this point, Jimmy did not have his iPad in front of him for usage. In fact, there was no sign of the device, its involvement with the lesson, or the class itself. Towards the end of the hour-long lesson, the aide placed the iPad in front of Jimmy. The paraprofessional then proceeded to play a number game by guiding the student's hand toward the screen forcing him to touch the correct numbers. I sat there, disappointed, taking my field notes. What I saw was not what I expected.

My experiences in Mrs. Carol's classroom, coupled with my years as an elementary teacher, increased my awareness of the usage and misuse of iPads with students with disabilities. I saw iPads used as a form of technology to enhance educational content, as well as a form of technology for in-class entertainment. When I was a fourth-grade teacher, I used technology because my school gave it to me. I decided that just using technology was not enough. I was curious to explore how this technology, specifically iPads, could transform my lessons. I moved from using "tech for tech's sake" to using it because it made a difference in the lives of my students. For the purposes of this study, I use the word technology in reference to technology in schools. I use the definitions of technology and technology integration from the Technology in Schools Taskforce (2003):

...technology pertains to the full range of computer and computer-related equipment and associated operating systems, networking, and tool software that provide the infrastructure over which instructional and school management applications of various kinds operate (p. 5). Technology integration is the incorporation of technology resources and technology-based practices into the daily routines, work, and management of schools (p. 75).

It is important to remember that these definitions do not describe successful technology integration but rather the foundations of technology integration.

Positionality

My position on this topic stemmed from my previous years as an elementary school teacher from 2007-2012. I chose to study iPad usage in the classroom because I was an early adopter of iPads into my classroom. I had the opportunity to pilot an iPad program where every student in my classroom received an iPad. Although I experienced the benefits of incorporating iPads into my instruction, I did not have the opportunity to see how iPads benefitted students with low incidence disabilities. Low incidence disabilities are the disabilities that we see least often in our classroom, as opposed to high incidence disabilities that we see more often. As a certified special education and childhood education teacher, I taught in an inclusive classroom. In my classroom, I had a diverse group of students, with up to five students identified with one of the 13 disability categories. The identified students were within the realm of high incidence disabilities (learning disabilities, mild to moderate intellectual disabilities, communication disorders, as well as emotional or behavioral disorders). Other teachers shared with me that they used iPads in their self-contained rooms to provide alternative ways for students with disabilities to access the general education curriculum. I wanted to understand how teachers use iPads with students with low incidence disabilities. My job as the researcher

was to tell the stories of the teachers, student users, and parents/guardians to advance the technological and curricular knowledge of all school personnel.

Context

One issue in schools today is that teachers receive technology without the proper training and support (Beyerbach, Walsh, & Vannatta, 2001; Bushrow & Turner, 1994; Inan & Lowther, 2009; Kurtts, Dobbins, & Takemae, 2012). With little training and support, teachers often feel unprepared to integrate technology with their students. They integrate and use the technology with their students with little guidance from school staff. It is here that teachers either sink or swim. It is important to understand what happens in classrooms when technology is available, especially with students with disabilities. The purpose of this research was to examine how teachers integrate iPads with their students with disabilities. Specifically, I wanted to understand if teachers instruct students to use iPads in a manner that benefits them educationally. This is important to understand in order for schools and teachers to provide positive educational opportunities for all students.

Teachers use technology in a myriad of ways. Technology usage relates to planning for instructional delivery, enhancement of a lesson, and delivery of instruction (Inan & Lowther, 2009). Nevertheless, just using the technology is not enough. Carver (2016) and Rogers (1983) explained that it goes beyond just acquiring it. Teachers are stuck on how to use the technology in the classroom because they are faced with barriers to integration (Alper & Raharinirina, 2006; Bausch & Hasselbring, 2004; Beyerbach, Walsh, & Vannatta, 2001; Carver, 2016; Flewitt, Messer, & Kucirkova, 2015). One

specific barrier is that technology constantly changes and schools change the technology that is available to teachers.

One specific form of mobile technology, iPads, leads in classroom technology usage because they are portable, affordable, interactive, and customizable (Etherington, 2011; Hu & Garimella, 2014; Najmi & Lee, 2009; Sharples, 2006; Shuler, 2009a). iPads provide enhanced opportunities not only as educational technology devices but also as also assistive technology devices. They also provide the needed supports and scaffolds that students with disabilities, especially students with low incidence disabilities need (Bouck, Flanagan, Heutsche, Okolo, & Englert, 2011; Judge, Floyd, & Jeffs, 2008). As a result, school personnel use iPads more often in schools today.

Chapter One introduces my dissertation study. The chapter is broken up into different sections including a background explanation, problem statement, list of research questions, aims of research, rationale for research, significance of study, and my theoretical framework.

Background

The usage of iPads and other mobile devices in the classroom is common in today's schools and has led to improvements in academic performance (Shuler, 2009b). Teachers use mobile technologies, such as iPads, as educational tools to assist students in learning. Researchers define mobile technology as, "the facilitation of learning and the delivery of educational materials to students using mobile devices via a wireless medium" (Bachfischer, Dyson, & Litchfield, 2008, p.287). Mobile technology allows students to collaborate with others, work independently, and access information (Linskens, 2013). Mobile technology, like the iPad, is easy to use across environments,

garners little negative peer stigma, and is very common in the lives of many adults and children, thus resulting in a narrower learning gap (Rodriguez, Strnadová, Cumming, 2013). Teachers use mobile technologies like iPads in classrooms with students with disabilities because of the positive effects, but I found little research on technology usage with students with low incidence disabilities.

Multiple scholars and organizations have defined the term low incidence disabilities. I chose to look at low incidence disabilities from the definition provided by IDEIA (Individuals with Disabilities Education Improvement Act) in conjunction with the definition from CAST (Center for Applied Special Technology). Students with low incidence disabilities vary from students with high incidence disabilities because of the prevalence of students falling under each category (Jackson, 2005). IDEIA (2004) places students with low incidence disabilities in Category C. Category C students are students that require the most significant support needs, thus requiring highly specialized teachers to know how to meet their needs (IDEIA, 2004). Students with autism often fall under the low incidence disability category because of their complex communication needs. In Table 1, I provide a visual of the different disability categories that fall under low incidence disabilities versus the categories that constitute high incidence disabilities from both IDEIA and CAST.

Table 1

*Low Incidence
Disabilities (LI)
vs. High Incidence
Disabilities (HI)*

IDEIA (LI)	CAST (LI)	IDEIA (HI)	CAST (HI)
Intellectual Disability	Blindness	Speech and Language Disability	Communication Disorders
Hearing Impairment	Low Vision	Specific Learning Disability	Specific Learning Disability (including ADHD)
Orthopedic Impairment	Hard-of-hearing	Emotional Behavioral Disorder	Mild/moderate Intellectual Disability Emotional or Behavioral Disorders
Visual Impairment including Blindness Deaf-blindness	Deaf-blindness		
Deafness	Significant Developmental Delay		
Other Health Impairments	Complex Health Issues		
Autism Spectrum Disorder	Serious Physical Impairment		
Traumatic Brain Injury	Multiple Disabilities		
Multiple Disabilities	Autism		

Effects of technology integration. Technology can enhance classroom learning through multiple avenues. Researchers, Murray and Olcese (2011) found that technology provides students with another modality for learning educational material when used as a visual, auditory, or physical tool. They explained four ways to integrate technology into the classroom in a meaningful way to include all students in the learning process: tutor, explore, tool, and communicate. For example, technology allows teaching through a

device. The authors concluded that students have the opportunity to use the devices to explore and make decisions about the information that they access and gain. Thirdly, teachers might use technology not just for educational purposes but also as a tool for entertainment purposes (Murray & Olcese, 2011). Finally, the authors stated that schools could use technology for student communication, whereby students send and receive messages and other information through networks. Teachers have the option to teach the curriculum through multiple avenues using technology. While these authors focused on the occurrences of technology integration in the classroom, it is also important to understand the additional benefits of technology integration and implementation.

Technology provides options for students to learn in different ways and provides adaptations to assist students with diverse needs. The U.S. Department of Education in their Technology Initiatives (2004) stated, “technology can help improve education by individualizing students’ needs, equipping teachers with technology tools, empowering the public with current data, expanding the reach of teachers to include the best resources and opportunities, and engaging students in new ways of learning” (as cited in Al-Bataineh, Anderson, Toledo, & Wellinski, 2008, p.382). Technology can also provide students with tools to meet their needs and equip teachers with the knowledge and tools to support their students’ needs through individualization and customization through apps. Technology can help to increase, maintain, or improve the functional capabilities of individuals, especially students with disabilities because devices help to decrease student isolation and increase classroom participation (Cavanaugh, 2004). The process of adapting and utilizing technology in the classroom affects both student users and teachers. Teachers need to know how to use the technology, as well as how to integrate it

into the curriculum to be able to address individual students' needs. As a result, technology can affect students' experiences either in a positive way when used effectively, or in a negative way when teachers do not receive the proper training and support.

In schools, teachers may use technology both instructionally and as an assistive technology tool (Douglas, Wojcik, & Thompson, 2012). Instructional technology refers to educational materials intended to teach ideas and concepts, whereas assistive technology is any tool or device that helps students perform a task with greater ease or independence (Douglas, Wojcik, & Thompson, 2012). While the literature presented from Douglas, Wojcik, and Thompson (2012) provided detailed information about how technology usage can enhance learning, it did not address the usage of iPads.

iPads are one type of popular technology device currently used in classrooms to support individualized instruction. iPads are commonly found in public schools because they are very affordable and have multiple built in accessibility features. They are also very practical, non-stigmatizing, and portable (Najmi & Lee, 2009; Sharples, 2006). The research from McClanahan (2012), Najmi and Lee (2009), and Sharples (2006) focused on how iPads redefine school culture. iPads help to redefine school, work, and home life because the technology offers one-to-one, self-paced tailored instruction (McClanahan, 2012). This one-to-one tailored instruction lends itself nicely to using technology with students with disabilities through individualized instruction (McClanahan, 2012). Researchers found that iPads specifically benefitted students with disabilities.

iPads as classroom technology for students with disabilities. McClanahan (2012) explained that iPads are one source of technology used more often with students.

The author explained the importance of iPad usage empathetically by announcing, “Barbara Ludlow-editor of *Teaching Exceptional Children* suggested that the iPad and similar devices are the future of one-to-one educational delivery, if not education itself” (p. 20). One-to-one education provides enhanced educational opportunities for students to learn and comprehend the information and content that teachers deliver through different avenues.

Dixon (2011) argued that iPads could be particularly useful for children with special needs stating, “For children or teens walking into schools this year, as well as for adults, the iPad is simply cool. It has the potential to be a powerfully inclusive tool” (Changes in Technology section, para. 2). All students benefit from the novelty effect of iPads because iPad applications are constantly changing and providing complex knowledge use (Johnson, Davies, & Thomas, 2013). iPads also provide several other benefits to students, including self-directed learning, personalized learning, offering an extension of prior learning, accessibility, increased engagement, and enhanced social interaction (Johnson, Davies, & Thomas, 2013). iPads have the opportunity to provide students and teachers with versatility, connectivity, and mobility (Mango, 2015). They also have the ability to help increase academic achievement and development of students throughout all content areas by providing a tool that is mainstream but still engaging and interactive (Cumming & Rodriguez, 2013). Using a tool like the iPad provides for unlimited potential for individualized teaching, learning, and communication (Cumming & Rodriguez, 2013).

Much of the research presented above provides reasoning behind why teachers incorporate technology into the classroom. There are multiple benefits for students. The

above research focuses more on the benefits and not as much on the extent to which teachers use the technology to support their lessons and the needs of their students. This is where my study enhances the literature.

Researchers found that iPads benefit students with disabilities, particularly low incidence disabilities because they assist in multiple areas. Different applications available for iPads allow users to work on areas such as home/life skills, community/neighborhood skills, school participation skills, school learning skills, health and safety, social skills, and advocacy skills (Douglas, Wojcik, & Thompson, 2012).

The literature review provides an in-depth look into iPad usage with students with low incidence disabilities. Two themes helped to explore this topic: technology usage in the classroom and the relationship between disability and technology integration. After a review of the literature, I found gaps that my study addressed. I explain the gaps in the literature in further detail in Chapter Two.

I specifically examined the usage of iPads in the context of K-6 inclusive school environments. For this study, I define inclusion as the placement of students with disabilities in the regular education environment where they receive needed services and supports for at least one content area of their day (Blankenship, Boon, & Fore, 2007; Obiakor, Harris, Mutua, Rotatori, & Algozzine, 2012; Villa & Thousand, 2003). In this study, I explored the usage of iPads in inclusive classrooms and the practices of teachers in supporting the needs of students with low incidence disabilities.

Problem Statement

The problem found from the review of literature revolved around the lack of published research on how teachers integrate iPads with students with low incidence disabilities. I found substantial information about iPad integration to enhance student

learning, but little research on teacher and student effects. I also found few practical and transferrable examples of iPad implementation and integration with students with low incidence disabilities. Finally, I further explain the stories of students who use devices and how that usage relates to their IEP goals, objectives, and needs, another field of knowledge with little research backing. The following research questions directly relate to the problems that emerged from the existing literature.

Research Questions

I supported my research through my findings of the literature and observations. I used the following research questions to help guide my study.

1. In what ways are iPads used in inclusive classrooms to support the needs of students with low incidence disabilities?
2. What are the iPad integration practices of teachers with students with low incidence disabilities?

Aims of Research

My research focuses on the usage of iPads by both students and teachers in K-6 educational settings with students with low incidence disabilities. iPads are a form of mobile technology; there has been an increase in teacher usage of iPads within educational settings with more than 4.5 million iPads used in U.S. schools (The Apple Corporation, 2015). Mobile technology provides a way for children to collaborate, interact, and learn from each other. Teachers use mobile technology with students with varying disabilities because of the ability to repurpose the device to fit the needs of students concerning assistive technology or for an educational enhancement tool (Cavanaugh, 2004). Since teachers use these types of technologies in the classroom, it is

imperative for them to understand how to integrate them best to meet the needs of their students.

Assistive technology plays a vital role in the integration of all students into their least restrictive environment and the inclusive classroom (Gray, Silver-Pacuilla, Brann, Overton, & Reynolds, 2011). Laws such as the Individuals with Disabilities Education Improvement Act 2004 (IDEIA) require schools to consider assistive technology when including students with disabilities in their least restrictive environment and identify services that are necessary to support their implementation [20 U.S.C. 1400 § 614(B)(v)]. The federal definition of assistive technology used in IDEIA is, “any item, piece of equipment or product system, whether acquired commercially or off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities” [IDEIA, 2004), 20 U.S.C. § 1400 (251)]. Assistive technology has the potential to facilitate instruction for students with disabilities in the inclusive classroom (Gray et al., 2011; Kurtts, Dobbins, & Takemae, 2012; Merbler, Hadadian, & Ulman, 1999; O’Malley, Lewis, & Donehower, 2013). Other studies based on mobile technology such as iPods and Palm Pilots helped make a case for using iPads in classrooms with students with disabilities. These studies focused on the usage of mobile technology regarding video modeling and communication for students with autism and intellectual disabilities and can be generalized to students with disabilities because of their effective usage as assistive technology tools (Burton, Anderson, Prater, & Dyches, 2013; Cihak, Fahrenkrog, Ayres, & Smith, 2009; Flores et al., 2012; Hammond, Whatley, Ayres, & Gast, 2010). I found limited existing literature on the usage of iPads in the classroom to the connection between iPads, academics, and

engagement (Carr, 2012; Cumming & Rodriguez, 2013; Ellis, 2011, Johnson, Davies, & Thomas, 2013; Mango, 2015; O'Malley, Lewis, Donehower, 2013).

Teachers use iPads instructionally and for entertainment purposes, but iPads also have the capability for customization to fit individual needs. My approach addressed what was currently occurring in schools with students with disabilities and how the usage related to their specific educational or communicative needs. My approach, through document analysis, semi-structured interviews, and observations did not describe the uses of the technology as positive or negative, but instead showed technology usage with students with disabilities and in what ways it provided them access (or lack thereof) to what teachers taught in the classroom.

Rationale for Research

The completion of this study is relevant within the field of education because technology changes constantly. iPads can increase student engagement, motivation, and accessibility (Carr, 2012; Cumming & Rodriguez, 2013; Ellis, 2011; Johnson, Davies, & Thomas, 2013; Mango, 2015; O'Malley, Lewis, & Donehower, 2013), which I discuss in Chapter Two. By integrating iPads into the classroom, students may have an opportunity to learn information through an additional modality. Johnson, Davies, and Thomas (2013) expressed that their participants agreed that iPad usage tended to reinforce core curriculum. This explanation built upon the fact that the participants integrated the devices during times of content reinforcement and review. Therefore, iPad usage in the classroom should essentially reinforce what the students are learning in all content areas. As a result, teachers should see growth, academically, for students with disabilities.

Effective usage of iPads as a way to support students with disabilities is important to prepare these students to participate in the classroom environment and learn along with their peers. Many schools still grapple with the inclusion of students with disabilities, especially since the passing of IDEA (Individuals with Disabilities Education Act) in 1975 (Villa & Thousand, 2003). As a result of IDEA, integration of students with disabilities into the general education classroom is more common (Villa & Thousand, 2003). As of the 2015-2016 school year, there were 6,814,410 students ages three to 21 that received services under IDEA (U.S. Department of Education, National Center for Education Statistics, 2016). An even smaller percentage, 3.18% of this population, fit into the category of low incidence disabilities (U.S. Department of Education, National Center for Education Statistics, 2016).

For this study, low incidence disabilities included students with blindness, low vision, deafness, hard-of-hearing, deaf-blindness, significant developmental delay, complex health issues, serious physical impairment, multiple disabilities, and autism. When considering the relationship between low incidence disabilities and the 13 Federal disability categories, I matched the categories from IDEA with the CAST (Center for Applied Special Technology) website definition. CAST is an educational research and development organization that focuses on UDL (Universal Design for Learning) in the classroom (CAST, n.d.). I chose to use the CAST definition because of their focus on UDL and assistive technology integration. For this study, the operational definition of low incidence disabilities included the categories listed above because of the importance that CAST places on technology. I matched visual impairments in IDEA with blindness and low vision in CAST, hearing impairments with deafness and hard-of-hearing, deaf-

blindness with deaf-blindness, intellectual disability with significant developmental delay, other health impairments with complex health issues, orthopedic impairments with serious physical impairment, multiple disabilities with multiple disabilities, and autism with autism.

Teachers will most likely have students within their classroom that have a disability because inclusion of students with disabilities has increased. According to the Condition of Education Report, from 1990 to 2004-2005, the percentage of students' ages six through 21 receiving IDEA services increased from 4.7 million to 6.7 million. As of 2014-2015, there were 6.6 million students served under IDEA and just over 60% of them received education inside the general education classroom class 80% or more of the time (National Center for Education Statistics, 2018). Because of the incidence of certain disabilities, multidisciplinary teams need to know how to support students, provide them access to the curriculum, and foster their learning and communication needs. Additional support comes from the usage of an iPad when used as an educational and assistive technology tool. The consistent usage of iPads allows the researcher to observe how schools use these devices within the educational context.

Significance of Study

Teachers have the ability to support their students' educational goals and learning needs by integrating instructional practices linked to iPad usage. This project is relevant because since 2010, the United States has promoted and leveraged the importance of technology to transform learning (U.S. Department of Education, Office of Educational Technology, 2017). Through the creation of the National Education Technology Plan (NETP), lawmakers established a national vision to enhance learning through technology

(U.S. Department of Education, Office of Educational Technology, 2017). By using technology such as iPads, teachers provide different opportunities to increase student engagement, motivation, and accessibility (Johnson, Davies, & Thomas, 2013). This study also contributes to the emerging body of literature on iPads used as educational tools for students with disabilities.

Teachers need to understand how technology can provide benefits for students with low incidence disabilities because the availability of technology in the classroom is increasing and the need for positive educational experiences for students with disabilities is important to help increase their learning capacity. Teachers and schools also need to focus on students with low incidence disabilities because these students represent the minority in the general education classroom and their inclusion is just as important as all other students. The research I found focused on students with high incidence disabilities because there is a greater percentage of students in education identified with these types of disabilities (U.S. Department of Education, National Center for Education Statistics, 2016).

The usage of iPads in classrooms varies. Teachers often feel they do not have the time to thoughtfully integrate the devices into their curriculum (Alper & Raharinirina, 2006; An & Alon, 2013; Bausch & Hasselbring, 2004; Beyerbach, Walsh & Vannatta, 2001; Flewitt, Messer, & Kucirkova, 2015; Inan & Lowther, 2009). Teachers can use these devices to make changes in the delivery of education. Teachers can garner and maintain the interest of our “tech savvy” students and digital natives and increase learning and authentic interactions (Bouck, Shurr, Tom, Jasper, Bassette, Miller, & Flanagan, 2012).

Technology integration is important because devices provide diverse opportunities for students to learn and promote self-directed learning (Sharples, 2006). Students learn differently, so including iPads can provide a different modality of learning when engaging in the curriculum to help reach those students that are technologically inclined (U.S. Department of Education, Office of Educational Technology, 2017). Technology is also an important collaborative tool because it has the potential to promote interaction between students. As a result, technology can provide a means to change the delivery of instruction whereby teachers take on the role of an encourager, facilitator, and coach (Murray & Olcese, 2011). Twenty-first century learners need to problem solve, innovate, self-direct, and collaborate (U.S. Department of Education, Office of Educational Technology, 2017); iPads are tools to help prepare these learners and can be instrumental for students with low incidence disabilities (Flores, Musgrove, Renner, Hinton, Strozier, Franklin, & Hil, 2012; Johnson, Davis, and Thomas, 2013; O'Malley, Lewis, & Donehower, 2013).

This study contributes to a better understanding of the educational contexts of individuals with low incidence disabilities and their usage of technology in the K-6 classroom. With a better understanding of these contexts, school administrators, educational teams, families, and the students themselves learn to improve classroom supports, educational outcomes, and technology usage. I grounded this study and the findings in a theoretical framework. I framed a picture of the integration of iPads in classrooms for students with low incidence disabilities.

Theoretical Framework

Before I could reference technology and disability in this paper, I first had to determine the meaning of the terms. I had to think about how I understood technology and disability. I determined that my ideas of technology and disability were rooted in how other researchers understand these areas. I found myself relating to a socially constructed definition of disability. Asch and Fine (1988) were the first to define the social construction of disability. They determined that, "...it is the attitudes and institutions of the non-disabled, even more than the biological characteristics of the disabled that turn characteristics into handicaps" (Asch & Fine, 1988, p. 7). This perspective of disability includes a definition constructed by people who are not disabled (Jones, 1996). For someone to understand disability in this way, they move from exploring disability as related to the people that have the disability to also understanding disability through the lens of the people who are not disabled (Anastasiou & Kauffman, 2011; Asch & Fine, 1988, Kliever, Biklen, & Kasa-Hendrickson, 2006). Having a social constructionist mindset on disability means that one celebrates the uniqueness of the individual and looks for ways to remove oppressive structures (Jones, 1996). It is within this mindset that I feel technology usage fits within the discourse on disability. As teachers, we need to remove the barriers in our classroom and provide tools to students with disabilities that will help them succeed within the educational environment.

Multiple authors focused on a particular barrier to reshaping a social constructionist mindset known as ableism (Storey, 2007) and ableism in the classroom (Hehir, 2002). Ableism is having prejudicial beliefs about someone because they have a disability, thus resulting in lowered expectations in the classroom (Hehir, 2002). Hehir (2002) explains that through the eyes of many educators, it is preferable for students who have a disability

to do things the same way as students without disabilities. Leonardo and Broderick (2011) referenced the ideology of smartness. When teachers have an ableist mentality, they conclude that some students are "smart" while also thinking that others are "no-so-smart." The authors explain this as pedagogical (Leonardo & Broderick, 2011). Ableism often occurs within a classroom setting because teachers and other school personnel are unaware of disability issues and often think that such students are not capable of doing something a non-disabled student can do (Storey, 2007). Leonardo and Broderick (2011) explain this as cognitive ableism, where teachers view students with disabilities as less capable. It is within this realm that disability and ableism connect.

Assistive technology, disability and ableism are also all connected. Two particular groups of researchers looked into how these three constructs connect. This connection relates to a disability studies lens. Disability studies looks at the portrayal of disability in society, but this concept is often lacking within assistive technology literature (Mankoff, Hayes, & Kasnitz, 2010). Mankoff, Hayes, and Kasnitz (2010) found that technology designers often define disability with respect to the intended usage of that piece of technology. Assistive technology interventions take on an ableist mentality that asserts that people with disabilities need to align with people without disabilities, for example student with autism need to be able to communicate like neurotypical people (Mankoff, Hayes, & Kasnitz, 2010). As a result, technology usually encompasses the ideas of about how a person should operate and are reflective of an ableist worldview (Foley & Ferri, 2012).

The designers of the assistive technology often relate more to the medical model of disability because they focus more on the physical and functional limitations of the

person (Mankoff, Hayes, & Kasnitz, 2010). Both Mankoff, Hayes, and Kasnitz (2010) as well as Foley and Ferri (2012) urge technology developers to create technology that is universally usable. Shneiderman explained the term universally usable as enabling, "...not just access to technology, but success (access and usability) by all, regardless of technology, ability, or skills" (as cited in Mankoff, Hayes, & Kasnitz, 2010, p. 5). This helps to create more of an inclusive design that works at closing the gap (Mankoff, Hayes, & Kasnitz, 2010). Foley and Ferri (2012) also urge designers to think more inclusively, "We contend that technology should be conceived of as a global, accessible, and inclusive concept, not one that requires a qualifier based on who it is for" (p. 192). It is at these crossroads that people understand the use of assistive technology is better.

I also believe that within a social constructionist mindset, teachers need to learn how to presume the competence of all their students. Biklen and Burke (2006) explain the presumption of competence as allowing others to reveal their thinking without assuming what they do or do not know. When teachers presume competence, they discover how to meet the needs of their students. They are able to tailor their instruction to enhance the opportunities of students with disabilities (Biklen, 1990; Blatt, 1999; Goode, 1992, Kliewer, 1998); this is where I believe the intersection between technology and disability comes into play. In schools, the presumption of competence is often related to the educational approaches available (Biklen, 1990; Blatt, 1999; Goode, 1992, Kliewer, 1998), thus either hindering or promoting the usage of technology.

To build off my theoretical framework, I explored three key concepts. First, I had to understand my definition of technology, especially mobile technology. Then, I had to look at the influence of technology in education. Finally, I had to determine how assistive

technology helps students with disabilities in academic instruction. I discuss these concepts below.

Key concepts. I explored three key concepts before embarking in my study. These concepts revolved around the definition of technology and its influences on education. The concepts include my definition of technology especially mobile technology, the influence of technology in education, and the integration of assistive technology in helping students with disabilities in education. The three key concepts characterize a progression of the representation of technology in the classroom. They also helped me to explore the research problem. The research problem involved the lack of research in how teachers integrate iPads with students with low incidence disabilities, and thus provides a foundation for this study.

Definitions. To understand the progression of my study, I had to define three major concepts, technology, mobile technology, and assistive technology. I defined technology as a piece of equipment used in conjunction with making learning easier and faster. I used the definition for mobile technology from Bachfischer, Dyson, and Litchfield (2008). They define mobile technology as, “the facilitation of learning and the delivery of educational materials to students using mobile devices via a wireless medium” (Bachfischer, Dyson, & Litchfield, 2008, p.287). For this study, I used the Federal definition of assistive technology from IDEIA. IDEIA defines assistive technology as, “any item, piece of equipment or product system, whether acquired commercially or off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities” [IDEIA, 2004], 20

U.S.C. § 1401 (251)]. I used these definitions to understand the influence of technology integration.

Influence of technology. To understand the usage of technology in education, I had to understand the influence of technology. Schools and teachers find that technology provides students with multiple educational benefits. Various authors discovered the added benefits of technology integration. Johnson, Davies, and Thomas (2013), as well as Cumming and Rodriguez (2013), found that technology like iPads increases learning and achievement through personalization, engagement, and self-direction. Technology usage also provides benefits to the teachers integrating the devices. Duhaney and Duhaney (2000) stated that technology allowed teachers the opportunity to change the delivery of instruction by creating new and different learning opportunities and activities. I included an expansive overview of technological influences in the literature review.

Assistive technology and students with disabilities. The various technologies available to students and teachers in schools today provide benefits, but schools have found that assistive technology especially benefits students with disabilities (Duhaney & Duhaney, 2000). Researchers found that teachers also used iPads as an assistive technology tool for students with disabilities. The applications on an iPad allow for personalized learning in a variety of skill areas (Douglas, Wojcik, & Thompson, 2012). Flewitt, Kucirkova, and Messer (2014) promote the usage of iPads with students with disabilities because they provided a simple learning curve, effortless touch, and allowed for immediate results and recognition. Researchers concluded that using iPads with students with disabilities requires the teacher to adapt the technology to fit the needs of the student. I focus my attention on this part of the literature. I decided that it is

important to recognize this confluence of concepts and their influence on the classroom environment. All three areas influenced the lens through which I viewed technology usage in the classroom.

Conclusion

In this study, I engaged myself in observations of students and teachers who used iPads in the classroom. I wanted to understand how teachers used iPads to enhance student opportunities and share these stories with other teachers and school personnel. It was important for me to understand how and why iPad usage varied throughout schools and classrooms in order to share these stories with future and practicing teachers. It was my hope that through observations, interviews, and document analysis, I might stumble upon new and innovative ideas for technology integration. Understanding iPad usage with students with low incidence disabilities was an important topic during my research and still is today. iPads are continuously increasing in number in our schools because of the ease of availability and the ability for teachers to heighten educational opportunities through interactive measures. I explain more about iPads in schools in Chapter Two. Chapter Two provides an overview of the literature with a focus on two main areas: technology usage and integration and iPad usage and disability. In Chapter Three, I focus on my methodology. I explain about my research design as well as how I analyzed the data. I provide my analysis in Chapters Four and Five. In Chapter Four, I explain about the iPad usage of my participants and their different stories. In Chapter Five, I explain the overlapping themes found between the participants, specifically how teacher practices often did not coincide with teacher beliefs. Finally, I connect the literature to the analysis in Chapter Six through my discussion and conclusion.

CHAPTER TWO: LITERATURE REVIEW

In this study, I sought to understand how teachers used iPads in classrooms with students with low incidence disabilities. In the previous chapter, I presented a background to the topic of iPad usage in classrooms with students with low incidence disabilities. I also provided my positionality on the topic, my aim for the research, as well as the significance and rationale. I concluded the chapter with the theoretical framework and research questions. I used the research questions to guide my search for literature and found out more about past research on the topic. I reviewed literature within the areas of technology integration in classrooms as well as disability and technology integration. To understand these areas of research, I had to understand the evolution of technology integration within the educational context.

With the advancement of educational technology and affect on student learning, I looked into the effects that technology has on students with disabilities. Schools in the twenty-first century need to equip their students with all possible knowledge for them to succeed in education as well as society. Researchers see technology integration in the classroom as twofold. Teachers use technology as an educational or instructional technology tool as well as an assistive technology tool. Cavanaugh (2002) defined educational technology as technology used as a tool in education, whereas the definition of assistive technology addressed technology tools used in education with students with disabilities. These were the most basic definitions. The themes of this chapter reflect the different forms of technology used in the classroom. I focused the first part of the literature review on the continuum of technology integration with the second part of the literature review on students with disabilities and their usage of technology. I found the

literature on assistive technology to be lacking within the realm of students with low incidence disabilities. When the literature discussed assistive technology with students with disabilities, it often referenced communication devices and had little connection to the academic goals and needs of the students. The problem with technology integration in schools revolves around classrooms often disregarding certain populations of students because they make up a small percentage of the population of students with disabilities. In addition, when I researched students with low incidence disabilities, I found a minimal focus on how the technology influenced them academically and within their least restrictive environment. Carver (2016) explained this phenomenon: “Its [technology] impact is determined by how teachers use the technology in their classroom instruction, not just the acquisition of technology” (p.110).

In this chapter, I provide a review of the literature. I broke up the literature review into two main sections: technology usage in the classroom with a focus on technology integration as well as a specific focus on iPad usage and disability. To understand technology usage in the classroom, I searched for literature about the different types of technology used in schools, barriers to technology usage, supports for teachers in integrating technology, and iPad usage in the classroom. I focused the second section on how schools use technology with students with disabilities, technology usage in an inclusive classroom, technology usage with students with low incidence disabilities, and iPad usage with students with disabilities. It is in this section that I found my perspective on disability, social constructivist perspective on disability to be more prominent.

Technology Usage in the Classroom

I found very general research around technology integration in the classroom. Much of the literature focused on how technology enhanced the educational lives of students (Campaña & Ouimet, 2015; Ellis, 2011; Etherington, 2011; Flewitt, Kucirkova, & Messer, 2014; Gray, Silver-Pacuilla, Brann, Overton, & Reynolds, 2011; Hu & Garimella, 2014; Linskens, 2013; Runyan, 2013; Ruggiero & Mong, 2015; Shuler, 2009a). I found a limited amount of research on integrating iPads as an assistive technology device with students with disabilities.

Much of the literature on technology integration in the classroom focused on the ways schools used technology to enhance lessons and activities but did not explain how a teacher must go beyond acquiring the technology and how to use it meaningfully in the classroom. According to Galloway (2010), technology refers to hardware and software within the physical and tangible world and the abstract realm of computerization. Technology used specifically in the classroom can be educational or instructional technology and can take the form of assistive technology. Technology can promote collaboration, where teachers can create learning environments where students work and learn together through the technology (Ellis, 2011; Linskens, 2013). Both Inan and Lowther (2009) and Lahm and Marisette (1994) proposed multiple ways classrooms could instructionally incorporate technology. Inan and Lowther (2009) explained that technology helped to enhance lessons, deliver instructional material, and enhance learning opportunities. Lahm and Marisette (1994) provided detailed examples of how to use technology instructionally: organization, note taking, writing, productivity, accessing materials, modification of materials, as well as assistance in cognitive activities. Neither Inan and Lowther (2009) nor Lahm and Marisette (1994) suggested the multiple uses of

technology in other realms of achievement. Judge, Floyd, and Jeffs (2008) argued that not only could technology enhance learning, but also teachers could use technology to assist in communication, movement, and sensory issues. Runyan (2013) also suggested that technology usage in the classroom provided access to the curriculum, enabled productivity, facilitated social networking and daily living skills, supported orientation, and built mobility skills. However, it is important to point out that the focus of technology needs to be on teacher usage in the classroom with the students and not just acquiring the technology (Carver, 2016). Therefore, it was important for me to take a deeper look into technology integration and implementation.

Technology Integration

While multiple authors focused on the instructional uses of technology, it was crucial to understand the importance of technology integration and implementation and the benefits that evolve from successful integration and implementation. Rogers (1983) explained the implementation and integration of technology through Diffusion of Innovations. He suggested that changes occurred over time when the diffusion of technologies occurred, but these changes occurred only if the technology provided an advantage to its user (Rogers, 1983). According to Rogers, diffusion is “the process by which an innovation is communicated through certain channels over time among the members of a social system” (p. 5). The author believed that diffusion is a form of communication in which a new idea incorporates a message. Rogers described innovation as an idea, practice, or object perceived as new; the object does not need to be new to the individual, but the act of the adoption needs to be new (Rogers, 1983). This theory uses the term innovation synonymously with the word technology. During

diffusion of an innovation, social changes occur. Gray, Silver-Pacuilla, Brann, Overton, and Reynolds (2011) and Ruggiero and Mong (2015) agreed that to move beyond acquiring the device and into successfully integrating the device, the device needed to help meet the needs of the student. Ruggiero and Mong (2015) researched specifically how teachers integrated technology to create meaningful learning opportunities for students. Through their research and survey results, they constructed four themes. The focus of technology integration had to include a focus on technology integration as a process to create learning, designing and restructuring lessons based on student needs, the range of technology usage according to the area of need, and seeing the value of technology (Ruggiero & Mong, 2015). While authors deemed technology integration as important, many authors found various barriers to implementing technology devices.

Barriers and supports to technology integration. Much of the literature pointed out that while there were benefits to integrating technology, barriers existed within schools that deterred teachers from integrating the devices effectively. According to ABLEDATA, an online database of assistive technology, there are over 20,000 available different AT devices (Bausch & Hasselbring, 2004), but educators are ill informed about these devices and allocation (Beyerbach, Walsh, & Vannatta, 2001; Bushrow & Turner, 1994; Kurtts, Dobbins, & Takemae, 2012). These hurdles lead to the barriers seen in schools relating to technology integration. School-wide barriers include access and availability of devices, support/training for teachers, lack of knowledge on how to integrate the device, and lack of time (Alper & Raharinirina, 2006; An & Alon, 2013; Bausch & Hasselbring, 2004; Beyerbach, Walsh & Vannatta, 2001; Flewitt, Messer, & Kucirkova, 2015; Inan & Lowther, 2009).

Not only did the scholars agree that these barriers existed, but some literature also suggested that these barriers occurred because of poor pre-service and in-service trainings (Beyerbach, Walsh, & Vannatta, 2001; Bushrow & Turner, 1994; Kurtts, Dobbins, & Takemae, 2012). According to the literature, there was a connection between the lack of support and training provided by pre-service institutions versus the lack of knowledge on how to use a particular device for teachers (Beyerbach, Walsh, & Vannatta, 2001; Bushrow & Turner, 1994; Kurtts, Dobbins, & Takemae, 2012; Inan & Lowther, 2009; Oliver, Osa, & Walker, 2012). Research conducted by Mintz, Branch, March, and Lerman (2010) focused on the strong connection between teacher attitude and its effect on teacher implementation of technology. The study looked into different factors that affected technology integration with students with disabilities. The research pushed for mobile technology used in a manner to achieve educational objectives with students with disabilities. The authors developed the HANDS project, which specifically helped students with Autistic Spectrum Disorders (ASD) develop social skills and self-management skills, thus building upon their communication skills and educational objectives. The study also focused on the ease of introducing something new and the issues that related to introducing a new technology (Mintz et al., 2010).

The study involved four test school sites that implemented a software application for mobile phones (Mintz et al., 2010). The completion of classroom technology evaluations related to the complex teaching and learning of the students and teachers in the classrooms (Mintz et al., 2010). Through ethnographic research, the authors found a correlation between teachers' general attitude toward ICT (Information and Communication Technology), another name for Information Technology, and its role in

their teaching practice, thereby, putting emphasis on teacher attitude versus teacher implementation. In line with the existing literature, the researchers concluded that there were certain mediating factors to integrating a new form of technology into the classroom: teacher attitudes, structural issues, teacher perspectives on responsibility, as well as teacher positioning about the curriculum (Mintz et al., 2010). For teachers to feel comfortable integrating a device into the classroom, schools need to support them through the process and educate them on using the device.

Edyburn (2004) also agreed that teachers needed to learn about technology and the process of integration before entering the classroom, so they felt prepared. Through a survey to teacher preparation faculty members, Oliver, Osa, and Walker (2012) discovered that 29% of faculty members did not teach their education students anything about using instructional technology in the P-12 classroom. The other 71% of the faculty members explained that the most common form of technology used in the classroom was PowerPoint (Oliver, Osa, & Walker, 2012). The study by Beyerbach, Walsh, and Vannatta (2001) researched how both pre-service teachers, as well as faculty members, needed to learn how to infuse technology; professional development included hands-on learning, peer support, and continuous updates on the changes to technology. Over the course of two years, the study analyzed 360 pre-service teachers regarding their beliefs on how technology helped students learn through observations, surveys, and focus groups (Beyerbach, Walsh, & Vannatta, 2001). The researchers found that through the implementation of their Goals 2000 project, certain teaching strategies were necessary for teachers to believe in the integration of technology and sustained classroom usage (Beyerbach, Walsh, & Vannatta, 2001). These strategies included relating hands-on

experiences to applications in teaching and learning, providing education courses that modeled technology integration, field experiences in technology-rich classrooms, and the promotion of a constructionist vision on technology infusion (Beyerbach, Walsh, & Vannatta, 2001). Thus, pre-service programs needed to focus on technology-enhanced teaching. The literature also addressed additional barriers beyond those limited to the school building.

The literature also highlighted some outside barriers that affected technology integration. Alper and Raharinirina (2006) and Carver (2016) found that outside factors included the high cost of devices, lack of funding, eligibility issues, and willingness to use the technology by the student. Flewitt, Messer, and Kucirkova (2015) agreed that technology was addictive and over-stimulating, thus it affected the students' ability to focus and enhance their own learning. As a result, supports needed to come from all involved including administrators, school staff, and teachers (Dyal, Carpenter, & Wright, 2009; Edyburn, 2004). All involved parties needed to rethink what it meant to integrate a device and come up with a unifying theory (Edyburn, 2004). The literature agreed that this support came from the institution of meaningful professional development supported by the connection between technology usage and curriculum standards (Dyal, Carpenter, & Wright, 2009; Kayalar, 2016).

Along with professional development, the staff, teachers, and administrators need to commit to change and accept support and guidance, as well as take on any technical issues (Alnahdi, 2014; Bushrow & Turner, 1994). However, Kayalar (2016) found that even with these supports, teachers used technology better for facilitating and delivering instruction rather than integrating technology into the teaching and learning process. In

response to these barriers, Coleman (2011) developed an assistive technology checklist because the author concluded that training, consistent implementation, and timeliness was imperative to the integration process. Coleman specifically looked at the impediments to successful implementation and access. The author developed a checklist of assistive technology services and needs, as well as assistive technology devices for appropriate and timely curriculum access. The author found that assessment, training, timeliness and consistency of implementation, motivation and effort, and factors such as the environment, psychosocial interaction, and culture all were impediments to access. In response to these issues, Coleman provided suggestions, in the form of an AT checklist, for teachers and related service personnel. The checklist provided pertinent questions to address the different areas related to access: AT services/needs including assessment, training, implementation, and other factors, as well as devices related to specific areas of access for physical support, computer access, communication, vision, and specific curriculum areas (Coleman, 2011).

In response to these shortcomings, multiple authors looked into different solutions and methods to help with the integration process. In the same study by Coleman (2011), the author provided possible solutions for educators about how to use assistive technology successfully in the classroom. In the beginning, Coleman suggested that teachers should address student needs through student assessments; this evaluation of the needs of the students versus the effectiveness of the device should be ongoing (Coleman, 2011). The author also concluded that training was imperative to the integration process because when there was a lack of training, underutilization of devices occurred. Parents, teachers, and students involved in the usage and integration of that device needed to

attend these trainings (Coleman, 2011). Timeliness and consistent implementation of a device was also important. Students needed to learn how to use the device so that implementation into their coursework occurred. Consistent usage of the device provided educators the ability to collect data on device usage, the benefits, and the match (Coleman, 2011). The author also addressed factors such as personal feelings, motivation, and effort and found that students were sometimes reluctant to use a device due to stigmatization. Teachers needed to provide the student with coping strategies to help with the acceptance of the device. Finally, the author found that motivation related to effort. If motivation increased, effort time load was reduced (Coleman, 2011). Coleman's (2011) recommendations provided a guideline for successful technology integration. The Technological Pedagogical Content Knowledge (TPACK) and Substitution Augmentation Modification Redefinition (SAMR) models that were developed provided technology integration guidelines.

The establishment of two models, TPACK and SAMR, shed light on the competencies and expertise that teachers needed to have for technology integration to transform the educational environment. TPACK involves specific teacher competencies needed for effective integration (Brantley-Dias & Ertmer, 2013; Harris & Hofer, 2011; Koh & Divaharan, 2011). It was here that the literature explained that the teacher's usage of technology became meaningful through the integration of pedagogical knowledge (PK), technological knowledge (TK), and content knowledge (CK). The combination of technological knowledge, content knowledge, and pedagogical knowledge formed the TPACK focal point where through the interplay of multiple knowledge bases, the teachers no longer saw each knowledge base in isolation (Koehler & Mishra, 2009). It

was also here where the teachers' use of technology became meaningful when integrating all knowledge bases. Additionally, the SAMR Model involved transforming lessons through substitution, augmentation, modification, and redefinition (Kihzoza, Zlotnikova, Bada, & Kalegele, 2016). Both the TPACK Model and SAMR Model enhanced teacher knowledge on the integration of technological devices. Pre-service institutions and school districts that implemented these models provided support services through trainings to teachers integrating technology in the classroom.

iPad integration in the classroom. The literature on technology integration presented above failed to address specific technology usage about iPads. iPads are a form of mobile technology that create portable learning opportunities, make learning interactive, and help to bridge the gap between the informal and formal learning (Najmi & Lee, 2009; Sharples, 2006). Technology integration evolves from year to year and includes distance learning, e-learning (web), and now learning through mobile technologies (Najmi & Lee, 2009). Bachfischer, Dyson, and Litchfield (2008) defined mobile technology as using mobile devices through wireless Internet to facilitate learning and deliver content to students. Additionally, teachers can use mobile technology for assessments, messaging, communication building, file-exchange, presentation and postings, sharing of information, personal management, information seeking and handling, games and simulations, data collection, and context awareness (Song, 2007). An and Alon (2013) constructed four models for iPad integration in the classroom and the different ways that their study's participants used iPads in the K-12 classroom environment. The manuscript explained why iPads became so popular and mainstreamed: "iPads equipped with applications, otherwise known as 'apps,' purport to

be educational, tend to keep children occupied, and appear to help motivate children to learn, thus encouraging many K-12 schools to invest funds for the purchase of iPads and apps” (An & Alon, 2013, p.3005). An and Alon found that there were four different ways that teachers integrated iPads into the classroom. These included the everyday, everywhere model, student-centered model, teacher-centered model, and the technology-centered model. The study also examined the challenges faced while using iPads as teaching/learning tools in the classroom. The four challenges discovered in their study related to professional development, funding, time, and distractions (An & Alon, 2013). Although this study explored the multitude of ways that teachers integrated iPads into the classroom, it did not focus on how teachers used iPads with students with disabilities.

iPads provide a benefit to schools and classrooms because they are more affordable, versatile, mobile, and customizable (Etherington, 2011; Hu & Garimella, 2014; Shuler, 2009a). The iPad is a tablet PC that came to the market in 2010 by Apple Corporation and has seen much of its usage within the educational context (Hu & Garimella, 2014). Apple has sold over 20 million iPads in the United States and out of all tablets sold, 99.8% used are iPads (Etherington, 2011). Schools use more tablet computers because of their affordability, versatility, and mobility, thus resulting in a 95% share in the U.S. education tablet market (Hu & Garimella, 2014). iPads provide customizable instruction through the App Store (Shuler, 2009a). An app is short for application; the definition of an app is software that extends the capabilities of a phone or tablet that allows users to accomplish and perform specific tasks (Purcell, Entner, & Henderson, 2010). Teachers can embed apps into the learning process to meet the needs of their students (Shuler, 2009b). For teachers to meet the needs of their students,

Rodriguez, Strnadová, and Cumming (2013) explained that there needed to be a strong fit between the iPad usage and instruction. This included purposeful planning and allowing the students to use the iPads in different settings and environments (Powell, 2014; Rodriguez, Strnadová, & Cumming, 2013). Rodriguez, Strnadová, and Cumming (2013) further explained the connection between technology and instruction as a strong focus on student needs through the specific usage of apps.

Researchers have found multiple benefits to iPad usage with students. Benefits of integrating iPads included not only increased learning academically, but also benefits in communication, visual attentiveness, reaching, and activating (Campaña & Ouimet, 2015). As a result, students were able to take responsibility for their learning, learn through an alternative path, and personalize their learning (Gray et al., 2011). Research by Flewitt, Kucirkova, and Messer (2014) found that iPads provided multiple benefits for students with disabilities because they allowed for effortless touch and provided immediate rewards, which in turn increased engagement. The researchers specifically looked at how teachers adapted iPads to suit the needs of students with disabilities (Flewitt, Kucirkova, & Messer, 2014). The focus of the study was on how teachers embedded iPads into classroom settings to build upon communication and literacy. The researchers discovered that the sensory and kinesthetic performance of touch technology from the iPad enabled and motivated the students to reach independence in their literacy skills (Flewitt, Kucirkova, & Messer, 2014). Increased independence then led to increased inclusivity within the classroom because students with disabilities took part in classroom activities through small group iPad instruction due to their portability and size (Flewitt, Kucirkova, & Messer, 2014).

The literature did not address the usage of iPads, the students who used the technology, and the instructional implementation. The literature explained the importance of iPad integration to enhance the learning of students with low incidence disabilities; however, the literature did not look at what the teacher did in order to meet particular student needs. The research supported the idea that iPads were used in multiple ways in the classroom however the literature lacked information about the activities that teachers planned to support individual student needs. During the present study, I observed teaching strategies and linked these to specific student needs. I used the interviews and observations to understand the extent to which teachers integrated iPads. As a result, through my study, I provided a connection between iPad usage in the classroom and the extent to which teacher integration and student usage affected the integration of the device to meet the needs of the students.

While the scholarship concurred that technology integration was important in enhancing the school experiences of students, the literature presented above did not include a focus on students with disabilities about technology integration. It was in this part of the literature review that I delve deeper into disability and technology integration, technology usage in an inclusive classroom, and assistive technology usage with students with low incidence disabilities.

Disability and Technology Integration

I needed to consider the topic of disability and technology integration in this study to understand a separate population of students served in our schools. Much of the research on disability and technology integration focused strongly on students with high incidence disabilities because of their prevalence within the general education classroom

(Jackson, 2005). I found a limited amount of research about students with low incidence disabilities and how their usage of iPads affected their educational needs and goals. I also had to frame my own beliefs about technology and disability within the social constructionist mindset. When understanding students with disabilities, I found that I viewed disability as a socially constructed phenomenon. Jones (1996) explained that persons without disabilities frame definitions of disability and often times include deficit thinking within the definition because they have limited contact with persons with disabilities. Exploring disability as a socially constructed phenomenon expands the definition to include both those with and without disabilities while focusing attention on social change and transformation (Asch & Fine, 1988; Jones, 1996). As a result, this altered mindset encourages schools and agencies to design programs and services that focus on the needs of the person with the disability (Jones, 1996). In order to align with this type of mentality, teachers need to break down the barriers of ableism. Teachers need to deconstruct persisting ideas that there are certain ways of living in the world and recognize that no one way is better than another (Ashby, 2010). Ashby (2010) referred to this belief as normalcy wherein people privilege certain normative ways over others.

Hehir (2002) defined ableism as:

...the devaluation of disability that results in societal attitudes that uncritically assert that it is better for a child to walk than roll, speak than sign, read print than read Braille, spell independently than use a spell-check, and hang out with nondisabled kids as opposed to other disabled kids (p.1).

When viewing disability through than ableist perspective, the inclusion of students with disabilities becomes more difficult (Storey, 2007). Johnson (2003) expanded on this idea of non-inclusive education and related it to other segregated programs. The author stated,

“because it was not seen as for ‘us’ but for ‘them,’ it was resented. Any money put into it was seen as taking from us” (p. 110). The crux of the problem relates to the wording of them (people with disabilities) and us (people without disabilities) and how we change that mentality (Storey, 2007). Hehir (2002) explained that the issue of inclusion could be resolved once the barriers of ableism are non-existent. When this type of deficit thinking is halted, more effective technology integration within the educational context can occur in support of students with disabilities.

When talking about disability and technology integration, the literature focused on the term assistive technology. Technology includes educational technology as well as assistive technology. Laws such as the Individuals with Disabilities Education Improvement Act 2004 (IDEIA, 2004) require schools to consider the use of assistive technology when including students with disabilities in their least restrictive environment and identify services that are necessary to support their implementation [20 U.S.C. 1401 § 614(B)(v)]. The federal definition of assistive technology has evolved and now is the same as the definition used in IDEIA, which is described as, “any item, piece of equipment or product system, whether acquired commercially or off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities” [IDEIA, 2004), 20 U.S.C. § 1401 (251)]. Assistive technology is a way to help students succeed within their needed areas, not to provide a “fix” or a “cognitive prosthesis” (Caverly & Fitzgibbons, 2007). Previous studies focused on the experiences of students with disabilities in school, their usage of technology in the classroom, and integration of devices.

Assistive Technology

Assistive technology involves a device or service that makes accomplishing a specific task easier (Parette & Peterson-Karlan, 2007). The literature agreed that assistive technology helps students succeed in a needed area by providing necessary supports and scaffolds (Bouck, Flanagan, Heutsche, Okolo, & Englert, 2011; Caverly & Fitzgibbons, 2007; Judge, Floyd, & Jeffs, 2008). Duhaney and Duhaney (2000) and Alexandersson (2011) agreed that assistive technology promoted cooperative learning, created unique new learning environments, and allowed students to take control of their learning. Ellis (2011) specifically researched school and hospital personnel's usage of assistive technology and the benefits to using technology with students with intellectual disabilities. Benefits included self-directed learning, personalized learning, the extension of learning, accessibility, increased engagement, and enhanced social interaction (Ellis, 2011). The benefits that resulted from the integration of technology helped affect the students' learning environment positively and allowed them to access the same curriculum as their peers. Duhaney and Duhaney (2000) also found that technology provided teachers with an opportunity to create a unique, new learning environment through integration into learning activities.

While the researchers agreed that there were benefits to integrating assistive technology into the classroom, these researchers did not address the issues of abandonment. Additional research focused on abandonment (Alper & Raharinirina, 2006; Bushrow & Turner, 1994; Dyal, Carpenter, & Wright, 2009; Phillips & Zhao, 1993), which included the subtopic about teachers lacking knowledge about devices. Multiple researchers found that educators were ill informed about assistive technology devices and allocation (Beyerbach, Walsh, & Vannatta, 2001; Bushrow & Turner, 1994;

Kurtts, Dobbins, & Takemae, 2012). Certain types of technological devices, like assistive technology, require multiple features and functions to help them run. These devices also incur higher costs. Schools must find funding and determine if students are eligible for certain types of technology because government agencies will not cover certain types of assistive technology. The lack of funding and denial of eligibility from government agencies often requires the schools to look at their budget to fund the needed technology (Alper & Raharinirina, 2006). Within these budgetary restrictions, schools have less and less money to work with but more state and federal mandates they have to follow (Alper & Raharinirina, 2006; Bushrow & Turner, 1994; Dyal, Carpenter, & Wright, 2009; Phillips & Zhao, 1993). Schools often pick the wrong types of devices when they are constrained monetarily (Alper & Raharinirina, 2006; Bushrow & Turner, 1994; Dyal, Carpenter, & Wright, 2009; Phillips & Zhao, 1993). When schools pick an incorrect device that students may not be able to use successfully, then the chance for abandonment increases.

Gray et al. (2011) and Chmiliar and Cheung (2007) explained that in order to combat abandonment, schools need to provide support to teachers and all people using assistive technology, including the service providers. Additionally, Gray and colleagues (2011) expressed the importance of better support for using assistive technology: “While every student served under IDEA is eligible for the consideration of assistive technology which could support their achievement and independence, the rate at which AT is actually delivered and supported for children is inconsistent and not well-documented” (p.18). Chmiliar and Cheung (2007) found that 70% of special education teachers did not receive training for assistive technology usage and integration, but rather the service

providers were the ones receiving the training. The authors concluded that training was critical for successful assistive technology usage because informed participation and collaboration were important and through training and professional development, teachers' knowledge on how to best support their students' technology needs increased (Chmiliar & Cheung, 2007). Without the focus on the multi-disciplinary team receiving the same training and support, the literature fell short on promoting the inclusive classroom environment needed for enhanced assistive technology integration.

Assistive technology in an inclusive classroom. The inclusion movement stemmed from the 1975 implementation of the Education for All Handicapped Children Act, also known as Individuals with Disabilities Education Act (IDEA) (Skrtic, Sailor, & Gee, 1996; Thomas & Loxley, 2001; Villa & Thousand, 2003). The original roots of assistive technology date back to before 1975 and the parent advocacy movement. This act promoted the right for children with disabilities to receive an education in their Least Restrictive Environment (Obiakor, Harris, Mutua, Rotatori, & Algozzine 2012). By the 1980s, this act evolved into including students with more intensive needs into general education classrooms where these students had access to meaningfully designed instruction through the general education curricula (Causton-Theoharis & Theoharis, 2008; Hitchcock & Stahl, 2003; Villa & Thousand, 2003). Finally, by the 1990s, it evolved into inclusion stating that students in special education must be able to participate, access, and make progress in the general education classroom (Hitchcock & Stahl, 2003).

The literature on inclusion agreed that for inclusion in the classroom to work, supports and services needed to occur within the classroom without removing the student

(Obiakor et al., 2012; Villa & Thousand, 2003). Inclusion referred to the placement of students with disabilities in the regular education environment where they received these needed services and supports (Blankenship, Boon, & Fore, 2007; Obiakor et al., 2012; Villa & Thousand, 2003). Villa and Thousand (2003) expressed the need for a combination of system-level support along with classroom-level support for inclusion to thrive. The authors referenced alterations to curriculum, instruction, and assessment including:

- A balanced approach to literacy development that combines whole-language and phonics instruction;
- Thematic/interdisciplinary curriculum approaches;
- Use of technology for communication and access to the general education curriculum;
- Differentiated instruction (p.22).

Even though the authors did mention the need for technology, the literature on inclusion did not cross-reference inclusion with assistive technology. On the other hand, Alnahdi (2014), Hitchcock and Stahl (2003), and Meyer, Rose, and Gordon (2014) explained that inclusion involved Universal Design for Learning (UDL), which focused on the intersection of assistive technology and education. Universal Design for Learning came out of the concept Universal Design used within the field of architecture (Meyer, Rose, and Gordon, 2014). Universal Design for Learning is a curriculum designed from the onset to meet the needs of a full range of students (Hitchcock & Stahl, 2003). UDL is a planning design that supports teachers including students with disabilities in general education (Meyer, Rose, & Gordon, 2014). Universal Design for Learning brings together research in neuroscience and education research. During the pre-planning stages of curriculum, teachers determine if technology could support student's needs and then how they could integrate technology into the lesson activities through options and

flexibility. With UDL, teachers incorporate multiple means of engagement, representation, and expression (Meyer, Rose, & Gordon, 2014; Nepo, 2017). As a result, UDL helps students overcome barriers and gain access to the curriculum (Alnahdi, 2014; Nepo, 2017). Today's technology affords teachers an easier avenue for implementing the proactive strategies of UDL because this technology has built in accommodations and adaptations (Nepo, 2017). Thus, this type of approach to designing the application of technology provides immediate feedback and additional prompts that help to reduce barriers and provide flexible usage (Nepo, 2017).

The area where UDL coincides with the usage of assistive technology is through the variety of materials and the expression of ideas. When using materials within the UDL framework, teachers need to create materials that are varied and flexible (Meyer, Rose, & Gordon, 2014). The authors believed that this variety engaged the learner in the learning process. The materials also offered alternative pathways to success where the teachers provided the students with varied levels of support and challenge, choice, and options for recruiting and sustaining interest and motivation (Meyer, Rose, & Gordon, 2014). The main goal of the authors of UDL was not about the selection of materials, but it was about creating options to meet the needs of diverse learners.

Universal Design for Learning assumes that by using flexible media and involving technology, educators can embed options into the curriculum to meet the needs of each learner (Hitchcock & Stahl, 2003). The integration of assistive technology in the classroom promotes classroom usage and the focus of adapting lessons to meet all students' needs (Kurtts, Dobbins, & Takemae, 2012). By incorporating components of Universal Design for Learning, educators make technology relevant and include the

appropriate content and method of instruction for the learner (Kurtts, Dobbins, & Takemae, 2012). Adapting lessons puts the focus on the student from the onset. Teachers then consider accommodations and modifications during the creation of the lesson and lessons include a wider range of learning styles and abilities, thus making it easier to meet the needs of the student (Kurtts, Dobbins, & Takemae, 2012; Nelson, 2006). Assistive technology blends planning and design techniques such as UDL to create an environment where all students engage in the learning process and have the opportunity to achieve.

While the literature on UDL explained that educators could use technology as an enhancement to a lesson or to support a specific student, it did not take into consideration how UDL specifically incorporated assistive technology. Additional literature focused on the best practices for integrating assistive technology into the curriculum. The literature focused on one particular area, sustained usage of technology. Akpan, Beard, and McGahey (2014) found that sustained usage resulted in increased benefits for the users. The authors explained that teacher focus should be on consistent classroom usage of an assistive technology device for students with disabilities to receive optimal benefits from their devices (Akpan, Beard, & McGahey, 2014). For sustained usage of assistive technology, Adebisi, Liman, and Longpoe (2015) researched the importance of team members matching a child's needs with specific technology. Along with this match, educators also taught technological skills to the child and the adults. Finally, on-going technical support and collaboration among the multidisciplinary team were necessary (Adebisi, Liman, & Longpoe, 2015). For sustained usage of an assistive technology device to occur, teachers and schools must consider all of these avenues. As a result,

sustained usage reduced costs for schools and helped to eliminate potential barriers that blocked instruction for students with varying needs (Akpan, Beard, & McGahey, 2014). Connor and Beard (2015) found a strong connection between the knowledge a teacher possessed on assistive technology and the likelihood of the teacher feeling motivated to integrate the device. With these ideas taken into consideration, it was important to address these issues with all disabilities and recognize the crossover. The inclusion movement and UDL promoted the usage of technology in classrooms to assist students in addressing all needs and reduced barriers (Rose, Hasselbring, Stahl, & Zabala, 2005). “In school environments today, assistive technologies, universal design, and UDL must co-exist, since no single solution provides all of the accessibility and support necessary for learning” (Hitchcock & Stahl, 2003, p. 49).

Assistive technology usage with students with low incidence disabilities. The Technology Related Assistance for Individuals with Disabilities Act of 1988 first defined AT for students with disabilities (Nepo, 2017). The purpose of the act was to secure funds for technology-related services for individuals with disabilities, thus defining this term (Nepo, 2017). Assistive technology usage with students with disabilities is widespread because of the reauthorization of the 1997 Individuals with Disabilities Education Act (Jones & Hinesmon-Matthews, 2014). Under Part B of the Act, school districts needed to provide effective guidelines within the IEP for AT usage because of the importance of planning for academic achievement (Jones & Hinesmon-Matthews, 2014). The National Council on Disability (2000) explained that under FAPE (Free Appropriate Public Education), schools needed to consider assistive technology as part of special education, and locate findings under the section titled related services, or

supplementary aids and services. I found scholarship on the usage of assistive technology in the classroom.

Davis, Barnard-Brak, and Arredondo (2013) conducted research on assistive technology acquisition and implementation. The authors found that out of 163 surveyed special education directors, they indicated that the person making the decision about which technology device to acquire often fell into the hands of the speech and language pathologist alone even though past research indicated that there were several advantages to assembling teams to make final product selections. The survey also elicited information about the common factors related to the decision-making process. Multiple special education directors (124) described a user-friendly device as the most important factor to consider, with the second most favored criterion being previous experience with the device (116 people) (Davis, Barnard-Brak, & Arredondo, 2013). Quinn, Behrmann, Mastropieri, and Chung (2009) researched the usage of assistive technology with specific groups of students. They found that assistive technology usage occurred most often in Grades 3-6, in self-contained classrooms (Quinn et al., 2009). The students using the devices within the self-contained classrooms constituted four main disability categories: multiple disabilities (27.71%), learning disabilities (16.72%), orthopedic impairment (14.66%), and autism (13.93%) (Quinn et al., 2009). Overall, the authors indicated that there was little representation of both high and low incidence disabilities and that future research needed to explore assistive technology devices and services for both these groups of students within not only a self-contained classroom but also an inclusive classroom setting (Quinn et al., 2009).

Much of the literature presented above pointed out the importance of the connection between assistive technology selection and student needs, but it did not focus on the improvements that assistive technology could have on students with low incidence disabilities. About thirteen percent (6.6 million) of students in the United States receive special education services (National Center for Education Statistics, 2018). Out of this total population, ten major disability categories made up the population of special education students served. Figure 1 depicts the different disability categories and the percentage of students ages six through 21 by disability.

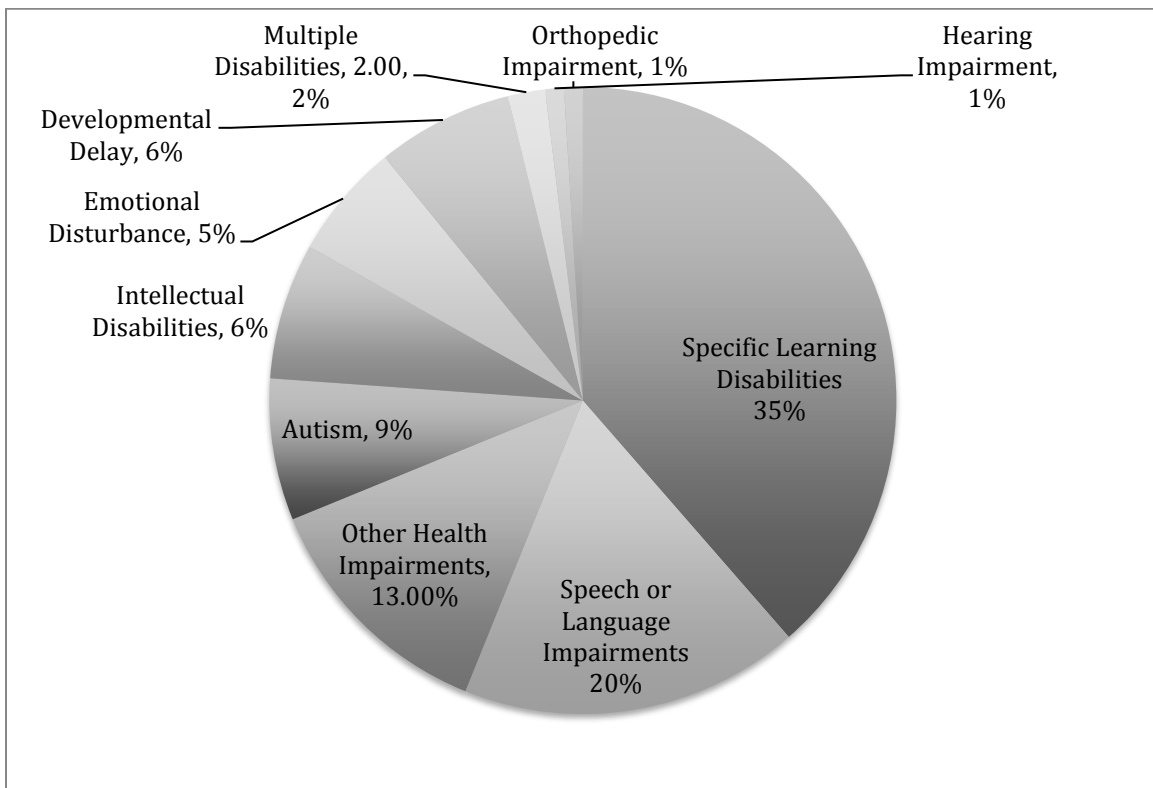


Figure 1. IDEA Categories and Percentage of Students. The figure depicts the top ten disability categories (out of the 13 categories) that fall under IDEA and the percentage of students ages six through 21 that make up each category.

One reason for this gap in the literature was that school districts encountered low incidence disabilities infrequently (Jackson, 2005). According to the National Center on Accessible Educational Materials and Center for Applied Special Technology (CAST) website, low incidence disabilities include each of these categories: blindness, low vision, deafness, hard-of-hearing, deaf-blindness, significant developmental delay, complex health issues, serious physical impairment, multiple disabilities, and autism. For this study, the operational definition of low incidence disabilities included the categories listed above because of the strong connections made by CAST about disability and technology integration.

The literature that addressed low incidence disabilities further focused on specifically students with autism and intellectual disabilities because iPads serve as easy augmentative and alternative communication devices (AAC) (McNaughton & Light, 2013). The usage of these types of mobile devices will most likely see an increase in schools and classrooms because of the availability of specialized communication-related applications (McNaughton & Light, 2013). Some students with autism spectrum disorder and Cerebral Palsy use AAC to help them communicate (Mirenda, 2008). According to Mirenda (2008), technology usage through AAC needs to become more frequent to support the development of communication skills.

iPads help to increase the usage of AAC because they offer potential benefits to users. iPads have the opportunity to raise awareness and social acceptance of AAC, availability of AAC solutions, increase adoption, greater functionality and interconnectivity, and increase AAC research and development (McNaughton & Light, 2013). In research by Connor, Snell, Gansneder, and Dexter (2010), the most frequently

used assistive technology device was an AAC device. They surveyed 44 teachers about their attitudes and usage of assistive technology and found that teacher preparedness was the most important predictor during the integration process (Connor et al., 2010).

Interestingly, the authors found that these teachers used general technology in their everyday lives, but when it came to integrating assistive technology and AAC devices, they were not as technologically savvy (Connor et al., 2010).

Flores, Musgrove, Renner, Hinton, Strozier, Franklin, and Hil (2012) and O'Malley, Lewis, and Donehower (2013) specifically looked at iPad usage with students with autism and the promotion of communication access and increased access to the curriculum. Flores et al. (2012) found that three out of five students in their study responded favorably to the app, Pick a Word, and all increased communication abilities with the app. Several of the students became interested in the usage of the iPad, which opened up multiple opportunities for the usage of the iPad in different realms of learning (Flores et al., 2012). Additionally, O'Malley, Lewis, and Donehower (2013) found that using math apps with students with autism created positive outcomes like greater independent task completion, increased student engagement, heightened interest in content, and increased math scores. Finally, a study by Johnson, Davis, and Thomas (2013) also explained that students with intellectual disabilities found greater independence and personalization in their learning skills, as well as enhanced engagement and social interaction when using an iPad.

iPad usage and students with low incidence disabilities. Technology evolves continuously with the invention of newer and cheaper devices. Manufacturers look for ways to repurpose everyday technology, so usage occurs in the classroom in conjunction

with students with disabilities to reduce stigma, lower abandonment, and make technology more affordable (Bouck, Shurr, Tom, Jasper, Bassette, Miller, & Flanagan, 2012). iPads are one form of technology that have built-in accessibility features, so educators can easily integrate the devices into the classroom for students with low incidence disabilities. The Apple iPad is a type of mobile technology that serves as a form of assistive technology for students with disabilities. Much of the research conducted on iPad usage involved students with communication disorders and visual impairments. iPad usage with students with low incidence disabilities results in not only academic benefits for students but also benefits in other areas. With the endless options of apps, students with disabilities can improve their communication, emotional development, sensory and visual perception, seeing and hearing, language development, and life skills (Etherington, 2011). Students with low incidence disabilities enjoy the responsive nature of iPads and the immediacy of results (Flewitt et al., 2015). Teachers and schools also enjoy the affordability and built-in accessibility features (Bouck et al., 2012). This area of research fueled the need to look into how educators use iPads with students with low incidence disabilities to support their needs.

Unfortunately, few researchers have explored the usage of iPads as instructional tools in special education (O'Malley, Lewis, & Donehower, 2013; Reichle, 2011). Reichle (2011) explained that in spite of assistive technology growth, much of the assistive technology integration involved non-tablet devices. I found only a few research articles that specifically referenced iPad usage. O'Malley, Lewis, and Donehower (2013) completed a single subject ABAB design study that focused on the instructional usage of the iPad. They looked at traditional math instruction as the baseline and a math app for

the intervention. The authors investigated how math teachers used an iPad as an assistive technology device with seven students diagnosed with autism to promote learning and independence. The findings from the study suggested that iPads created positive outcomes for students with disabilities when used within the classroom context. The authors found that students with autism demonstrated greater independent task completion and either maintained or improved math scores. The teachers from the study also felt that using iPads for instructional purposes positively influenced student engagement, interest in the content, and independence (O'Malley, Lewis, & Donehower, 2013). However, for technology implementation to occur, the authors found certain areas to consider including technical and logistical considerations, staff training, and parent involvement. The researchers supported the idea that teachers supported student needs through the modifications and adaptations that iPads provided, and as a result supported Universal Design for Learning (UDL), a framework that promoted inclusion.

As portrayed in the literature above, the apps used with students with low incidence disabilities were mostly edutainment apps. Edutainment apps combine education with entertainment where the teacher or user cannot change or extend the content (Flewitt et al., 2015). The extension of apps to match individual student needs was where the research lacked. The research also lacked in personal stories and achievements of using the devices. I gathered more information from major stakeholders, teams of teachers, student users, and one parent to understand how students with disabilities use iPads and how this usage might affect students' learning and communication needs. My interviews and observations helped to take the study by Johnson, Davies, and Thomas (2013) one step further to investigate specific apps that teachers used in the classroom and the extent to which these

apps and programs opened up access to the curriculum.

The usage of iPads allows students to experience equal opportunities within the classroom environment. When provided with a matched assistive technology device, student users access the curriculum through alternative means (Bouck et al., 2012). For example, assistive technology allows students to build upon their technology-literacy skills, take part in authentic learning tasks, and learn in multiple styles (Bouck et al., 2012). Access to the curriculum focuses not only on immersion in the content of the classroom but also the ability for all students to be able to send and receive messages to their teachers and peers while building communication abilities.

Conclusion

The literature review helped to shed light onto technology integration in classrooms. The literature focused on the variety of ways educators used technology in the classroom, whether for assistive technology purposes or educational technology purposes (Lahm & Marrisette, 1994). Each of these ways provided students with supports within the realm of communication, sensory, and learning (Judge, Floyd, & Jeffs, 2008). Technology allowed for an increase in participation by supporting and differentiating the learning for the students (Bouck et al., 2011; Judge, Floyd, & Jeffs, 2008). In order for this to occur, the literature explained that schools needed to provide teachers with supports (Dyal, Carpenter, & Wright, 2009; Edyburn, 2004), as well as the assistance to overcome barriers that often accompanied technology integration (Bausch & Hasselbring, 2004; Beyerbach, Walsh, & Vannatta, 2001). I also focused my literature review on the specific usage of iPads in the classroom because I wanted to understand how teachers used these devices with certain groups of students. When integrated

appropriately, iPads allowed for increased independence and participation for students with disabilities (Bouck et al., 2011; Judge, Floyd, & Jeffs, 2008).

The literature had a heavy focus on iPads in special education used as assistive technology. However, the research lacked substantial information about students with low incidence disabilities and how they utilized assistive technology. To understand this area of special education, I looked at literature about students with low incidence disabilities and their role in inclusive education. Again, I found that there was more of a mention of technology usage regarding augmentative and alternative communication; however, the literature did not mention the extent to which teachers and students used iPads for meeting learning goals and IEP goals within the inclusive school setting.

Gaps in the literature. After a review of the literature, two main themes emerged about technology usage in education. The first theme I identified was technology usage in the classroom. I found literature that described the technology integration process, the barriers and supports to technology integration, as well as how teachers incorporate iPads into the classroom. The second theme that emerged from the literature review focused on disability and technology integration. In this section, I found literature about technology usage in inclusive classrooms, assistive technology usage, and iPad usage with students with low incidence disabilities. After a review of the literature, I found gaps that my study would address.

The gaps in the literature revolved around the usage of iPads, the students who used the technology, and instructional implementation. The literature explained the importance of iPad integration to enhance the learning of students with low incidence disabilities; however, the literature did not look at both the teacher effects and student

effects on instructional implementation. The research supported the idea that teachers used iPads in multiple ways in the classroom, however the literature lacked information about the activities planned by the teachers to support individual student needs. During my study, I observed teaching strategies and linked these to specific student needs. I used the interviews and observations to determine why teachers taught in specific ways. As a result, I found a connection between iPad usage in the classroom and the extent to which teacher integration affected the integration of the device to meet the needs of the students.

It is imperative to understand how successful technology integration occurs and how to match student needs to technology usage to appropriately utilize a piece of technology. The practical knowledge I researched in my study may help teachers integrate iPads more successfully with students with disabilities. The gaps in the literature showed that research did not provide practical and transferable examples of iPad implementation and integration for students with low incidence disabilities. Providing specific examples of the usage of iPads to help support students with low incidence disabilities in inclusive settings helped address this.

The literature also highlighted the usage of iPads with students with disabilities, specifically students with communication disorders, intellectual disabilities, visual impairments, and autism. On the other hand, it did not provide in-depth information about the usage of iPads with students with low incidence disabilities and whether or not these students were meeting their individual goals, objectives, and needs as stated in their IEPs. In addition, specific studies addressed access issues to the curriculum, but they failed to address the setting of the access. A researcher needs to take into consideration how often

students access their least restrictive environment. I examined access to general education and how this connected to iPad usage, thus adding to the literature.

In this chapter, I synthesized the pertinent literature around my topic of iPad usage with students with low incidence disabilities. Much of the literature focused on two main areas: broad technology integration and the benefits associated with classroom usage as well as assistive technology integration with students with disabilities. However, the literature did not provide ample research on how teachers integrate technology like iPads as a form of assistive technology with students with low incidence disabilities. The lack of literature pushed me to look into how teachers integrate iPads with students with low incidence disabilities within an inclusive elementary setting and if the iPad usage related to the students' academic needs and goals.

My need for more information in this particular area fueled my research questions and methodology. The research questions are:

1. In what ways are iPads used in inclusive classrooms to support the needs of students with low incidence disabilities.
2. What are the iPad integration practices of teachers with students with low incidence disabilities?

In Chapter Three, I outline my methodology for the research. It provides a background on the qualitative research, my research design, and the description of my participants.

CHAPTER THREE: RESEARCH DESIGN, METHODS, AND PROCEDURES

In this chapter, I outline and discuss the qualitative research methods I used to investigate the usage of iPads in a kindergarten-sixth-grade inclusive classroom to support the learning needs of students with low incidence disabilities. I include information on the qualitative traditions that ground this work in the first section. I focused the second section on the design of my study, selection of participants, procedures, instrumentation, analysis, trustworthiness, ethical considerations and confidentiality. I focused the final section on the description of the participants. My methods addressed the following research questions in regards to the kindergarten-sixth-grade setting:

1. In what ways are iPads used in inclusive classrooms to support the needs of students with low incidence disabilities.
2. What are the iPad integration practices of teachers with students with low incidence disabilities?

Qualitative Research Tradition

I drew upon the qualitative research tradition, specifically grounded theory, in which I described the stories and experiences of my participants (Johnson & Christensen, 2008). I used semi-structured interviews, observations, and document analysis to collect data and form stories of the occurrences in the classroom regarding iPad usage with students with low incidence disabilities. Then, I proceeded to tell the stories of my four participants and their usage of iPads.

Grounded Theory

Grounded theory is a form of qualitative research that involves generalizability and observations in a variety of settings (Bogdan & Biklen, 2007). Glaser and Strauss first developed this theory in the 1960s (Creswell, 2008). Creswell (2008) defined grounded theory as the exploration of common experiences of individuals in order for a researcher to develop a theory at a broad conceptual level. In the case of my research, I generated a general explanation for the usage of the iPads by examining the experiences of the student participants and the actions of the teachers. As Creswell (2008) explained, I grounded the explanations in the data from the participants. Grounded theory involves purposeful sampling and the collection of interview data; in the data analysis, the researcher connects categories in order to formulate an explanation (Creswell, 2008). Grounded theory is often associated with theories and used when existing theories do not address a specific problem or group of participants (Creswell, 2008). Since my study involved students with disabilities, very few theories applied to this special population.

Research Design

I grounded this study in a qualitative research design, specifically grounded theory. My research strategy involved a combination of systematic design and constructivist design with open coding conducted with my data. I did not create a theory, but instead, I explained the feelings and beliefs of my participants through the questioning of my data (Creswell, 2008). I used different data collection methods to gain access to the experiences of the participants and weave together their stories of education. I collected data from multiple parties. The research involved careful, in-depth studies of the individuals and situations (Johnson & Christensen, 2008).

I looked at four participant groups and how these groups implemented iPads in their inclusive setting. Through grounded theory, I used a combination of different collection methods. For this study, I used semi-structured interviews, observations, and document analysis. I portray the methodological design of the study in Figure 2.

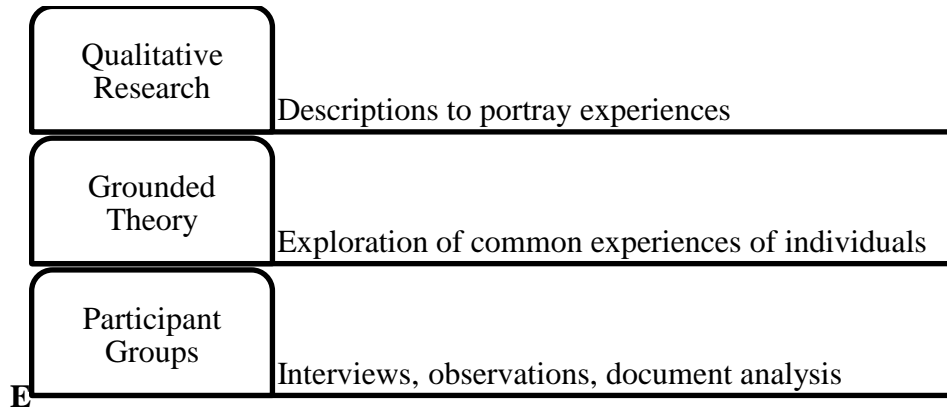


Figure 2. Research Design. This figure describes the design of the study including qualitative research, grounded theory, and participant groups.

I conducted both observations and interviews with four participant groups. Within each group, I completed interviews with teachers and students (depending on consent) along with document analysis (depending on consent), and observations of the students within a classroom environment. I also offered parent interviews, but only one parent agreed. Focusing on the usage or non-usage of technology in the classroom by the focal student, I analyzed activities across the groups. For the analysis, I wrote about each participant's story and I extracted themes that evolved throughout the interviews and observations. Then, I looked across participant groups to determine if themes overlapped or if new themes emerged. I looked across the different participant groups to find links to real-life situations. I could not find these links through a survey or experiment (Yin, 1994).

I used semi-structured interviews through an interview guide along with observations of the different teams of personnel who used iPads to support students with low incidence disabilities. I also used document analysis to analyze student's school records, such as his or her IEP (Individualized Education Program). In Figure 3, I illustrate how the different data sources related to the specific interview questions and how I analyzed the data.

Interviews

I used semi-structured interviews through an interview guide because it helped to address preplanned research questions and provided more structure. Through an interview guide approach, I decided upon the questions and order of presentation (Johnson & Christensen, 2008). I varied the questions in format and interpretation by the informant (Appendix B). I guided the questions but also allowed for on the spot questioning and additional prompting. To gather the perceptions and perspectives of assistive technology usage, I used semi-structured interviews with student users, teacher teams, and one parent. I conducted interviews with the teacher teams before the observations to gather information about the usage of iPads in the classroom. I conducted student interviews while observations occurred and final email interviews with teachers after all observations occurred.

Observations

I completed observations of my student participants and their corresponding teachers (Table 3). I used observations to reduce obtrusiveness and allow for prolonged contact so that reactions diminished (Johnson & Christensen, 2008). Observations allowed me to experience what it was like to be in the situation. These naturalistic

observations occurred in the classroom, where the students exhibited the behavior (Johnson & Christensen, 2008). I used observations to gather data on the usage of iPads to meet the needs of the user and the integration of technology into the curriculum.

Document Analysis

I used document analysis as an additional data source to analyze the special education services of my participants. Multiple data sources also helped with triangulation (combinations of data collection procedures).

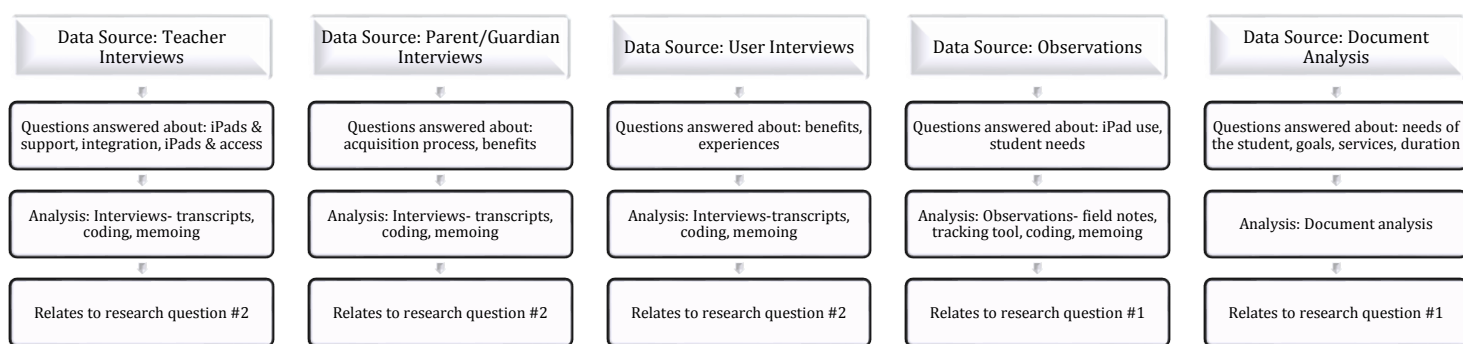


Figure 3. Data Analysis. This figure represents how I related the interview questions to the different data sources and analysis.

Setting

My setting included three elementary schools and one middle school in New York State. I gave each school and participant a pseudonym to protect confidentiality. School One was one of two middle schools in the suburban Everly District, located in Central New York. The building housed Grades 6 through 8. The middle school focused on a team concept where teachers had a core group of students. Each of the nine classes were 42-minute periods. The teams of teachers included content area teachers for each grade

level including English, social studies, science, reading, math, and a school counselor. Each team of teachers met every day to coordinate curriculum, review student work, and address parent and student contacts and conferences.

School Two was an elementary school in the small, rural Wellington District in New York's Southern Tier. The school was on one campus where all grades, preK-12, shared the same building. The school provided an iPad to every student in the elementary school. The students used their iPads throughout the school day. The curriculum focused on English language arts, math, science, social studies, as well as supplemental classes on health education and character building. During the school day, students received special classes in art, music, physical education, library, and computer science.

School Three was one of nine elementary schools in the Littleton School District. This school district is in a suburban area of Central New York. The school contained Grades K-6. The average class size for Grades K-3 was 22 students and 23 students for Grades 4-6. The elementary curriculum focused on five different subject areas including English language arts, social studies, science, math, and the fine arts.

School Four was one of two elementary schools within the Cedar School District. The Cedar School District was also in Central New York. School Four housed Grades K-4 with class sizes averaging about 21 students. Cedar's elementary program focused on child-centered education, heterogeneous grouping, integrated language arts, constructivist mathematics, and multi-disciplinary instruction. School Four integrated all special education students into their inclusive classrooms.

Selection of Participants

For this study, I selected teacher teams based upon their usage of iPads with specific students within their caseload. I focused on how the teacher teams used the technology devices to enhance student learning and accomplish specific student needs and goals. I gathered data through purposive sampling of four participant groups. Purposive sampling was the most appropriate in this case since the research questions required participants with specific characteristics (Johnson & Christensen, 2008). I identified participants through purposeful sampling by emailing current administrators and other school personnel to recommend qualified participants who fit the criteria of the study. I describe the participant inclusion criteria in Table 2.

Table 2

Participant Inclusion Criteria

Teachers	Students	Parents/Guardians
Has a student with a disability that uses an iPad	Is a kindergarten-sixth-grade student	Has a child that meets the inclusion criteria
Integrates iPads into the classroom	Has an IEP	
Teaches in a kindergarten-sixth-grade setting	Has a low incidence disability	
	Uses an iPad in school	
	Is placed in an inclusive classroom with students with and without disabilities	

I identified teams of teachers through special education administration in their schools and then asked them to explain their usage of iPads in the classroom, how often usage occurred, and when it occurred. The schools and participants that I included in my study had little diversity because the schools were predominantly white schools. In

addition, due to purposeful sampling, many of my personal colleagues also were not as diverse. I was unable to receive access to larger, urban schools because administrators did not contact me back. I depict the demographics of my participants in Table 5.

Each participant group consisted of teams of teachers with a corresponding child that used an iPad in an inclusive classroom. The student had to learn curriculum content for at least one content area during the day with his/her same age peers. The user also had to be fully included in the general education classroom for at least one content area instruction period, whether that be ELA, math, science, social studies, or the full instructional day. The general education or special education teachers were from the elementary grades (K-6) in a public school setting. Additional teachers on the team included speech and language pathologists, occupational therapists (OT), physical therapists (PT), paraprofessionals and teacher's assistants, as well as AT integration consultants. Once I identified teams, I asked for access to individual student IEPs, if consent allowed. In the IEP, I looked for identified services for the student, who carried out that service and when, as well as student learning needs and goals.

The students all had IEPs and identified with a low incidence disability. Students learned in an inclusive classroom setting in the general education classroom for at least one content area class. According to the National Center on Accessible Educational Materials and Center for Applied Special Technology (CAST) website, the disability types that I included in the realm of low incidence disabilities included blindness, low vision, deafness, hard-of-hearing, deaf-blindness, significant developmental delay, complex health issues, serious physical impairment, multiple disability, and/or autism (Jackson, 2005). I looked at the usage of the iPad as a way to support or hinder the

student in accomplishing his/her learning needs and/or communication needs. iPad access and usage came with the option of just being used in school, and/or at home, but did not have to be synonymous.

I started recruiting by contacting administrators, such as the Director of Special Education in the hopes of finding teams that possessed technological strength in integrating iPads (see Appendix A). I talked with the administrators that I knew in the area and had them suggest certain teacher teams that they knew had students that utilized iPads. I considered this purposive sampling. During recruitment, administrators considered these teams already strong in the area of technology integration and the usage of iPads. Then, I contacted these teachers to see if they were willing to participate in an interview and multiple observations. At this point, I made sure that they had students that used iPads in the classroom and had an IEP with a low incidence disability identification. I ascertained the frequency and duration of the usage, as well. Once I found and linked teacher teams directly to students, I then asked the teachers to send home consent letters for the students. These students and their parents/guardians also became participants if they gave consent. I describe the different steps of the recruitment and data collection process in Figure 4.

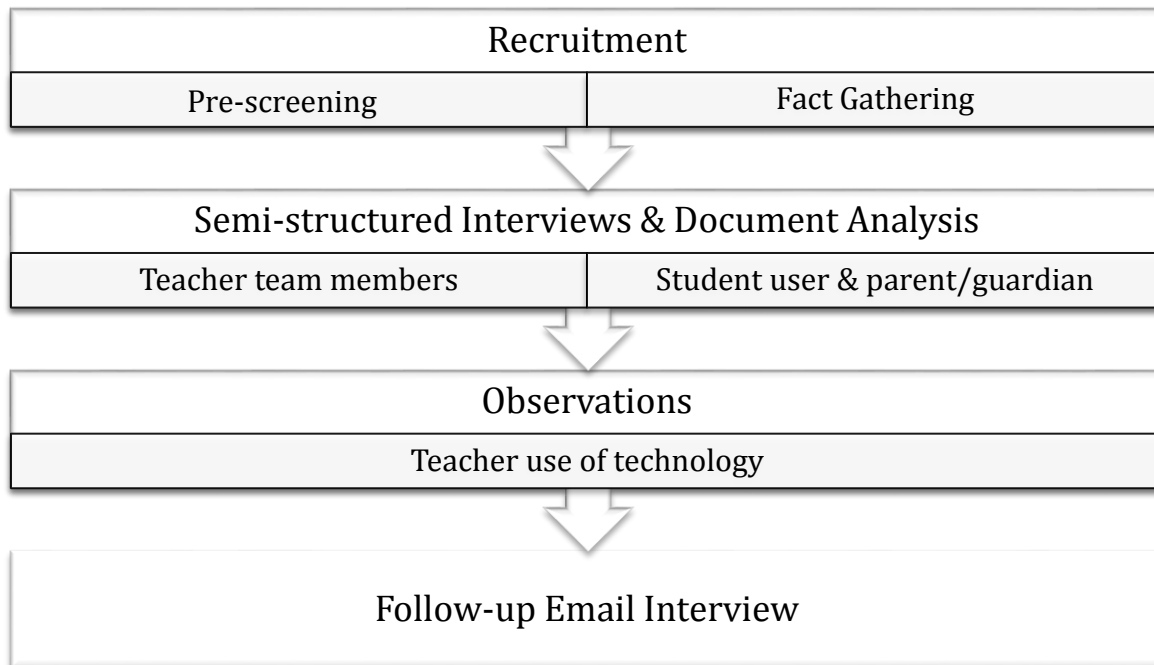


Figure 4. Participant Selection Procedure. The above figure describes how the participants continued through the recruitment and study process.

Procedures

I gathered data through semi-structured interviews, fact gathering through document analysis, and observations. First, I found teacher teams with corresponding students via the process described above. In the various school districts, special education directors, principals, and superintendents provided a list of teachers that used iPads with students with disabilities. Through emails with one superintendent and one special education director and meetings with one principal and another special education director, I determined which teachers to focus on and gained access to the school with a letter of cooperation. Once provided with four names, I then proceeded to email these teachers about participating in the study. After email correspondence and the establishment of preliminary meetings with all participants, I set a schedule for observation times. It was about two months from the start of the email correspondence to

the setting of a preliminary meeting and the scheduling of observations. All four agreed to participate. The four teachers became my four schools. I then found the other teachers that worked with the students of interest and interviewed them. In one school, I had to contact a different teacher to participate because I discovered that the student they picked did not have a low incidence disability.

I determined the stopping point when I saw the same situations of iPad usage occur repeatedly with the different participant users. Once I saw consistent, repeated usage, I decided to stop collecting data (data saturation). I did choose to add additional interviews with participants after I finished observations to clarify their iPad usage. I only heard back from five teacher participants for these follow-up interviews.

Gaining Access

I had four schools participate in my study. In order to allow them to participate, I had to gain access. Next, I describe my process for gaining access to each of the four schools.

School One. In School One, I contacted the superintendent to determine the names of the participants that I should contact directly. The superintendent provided me access to the name of the special education director who then provided me with a list of teachers who had children who fit my description. After meeting with the special education director, she guided me in the direction of certain students who utilized the iPads frequently. As a courtesy, she emailed the teachers and asked them if they would participate in the study. Each teacher on the team agreed to take part. After the initial email, I contacted the teachers for an interview.

School Two. School Two was the first school to become a participant site for my study. This school integrated iPads into everyday classroom activities for the last several years. Therefore, after short discussions with the elementary principal and superintendent, the school granted me access. I reached out to Mr. Pintak who was a huge proponent of iPad usage. He piloted the usage of iPads with his self-contained classroom about five years ago. At the beginning of the study, he moved from teaching self-contained and now pushed into the classrooms. Mr. Pintak explained to me that there was a student in Mrs. Credence's second-grade classroom that used the iPad to help build upon the skills he learned in the classroom. Since Billy fit all of my requirements, I decided to focus on him.

School Three. I had no personal contacts in School Three. After finding out who the Director of Special Education was, I emailed her because I knew that we had some common acquaintances. I explained my research project, and she graciously accepted me into her district. She was a big proponent of increasing awareness of technology in school, as well as Ph.D. students conducting research in her classrooms. She provided me with a list of teachers that might participate. Of the six teachers that I emailed, two teachers emailed me back. Of the two teachers, only one had a student who fit my criteria. Luckily, this student also had a parent who answered questions about her daughter's iPad usage. I connected with this parent through email.

School Four. The last school that I gained access to was School Four in the Cedar School District. This school was one of the first schools to grant permission for research but took me the longest to connect with the teachers there. The principal of the school prompted me to contact the speech teacher in the district. She graciously allowed

me to explain my research project. She forwarded me the names of the special education teacher and general education teacher of the student that fit the profile. She then expressed that she was very busy and hoped these teachers would be able to help me because she could not. I proceeded to contact the special education teacher and the general education teacher. The special education teacher told me that she was not the one to speak with and that I should contact the speech teacher and general education teacher. Her email stated, "The speech teacher said she was the point person on this being the speech therapist. So, I think you need to get a hold of her." The speech therapist never responded to my follow-up emails, and the general education teacher was on maternity leave until October. I emailed the general education teacher, Mrs. Tindle, about doing research in her room and she told me she was up for it. After a week went by and Mrs. Tindle returned from her maternity leave, we corresponded about a time to meet and conduct the initial interview. I interviewed her on October 28, more than a month after initial contact and more than two months after the school granted me permission.

Technology usage in this school was an everyday occurrence during the interview and observations. In October 2015, Mrs. Tindle first received a class set of iPads and her school expected her to integrate them into her teaching. This was the same time that I was conducting my study. She tried to find a balance between when to use the iPads, when not to use them, the benefits, and the negatives. Mrs. Tindle expressed to me that with higher expectations and requirements from school districts and state initiatives, teachers tried to keep up with the school district's requirements.

Interviews. Once I established the teachers, I completed interviews lasting about 15 minutes to one hour with each willing participant on the teacher team to determine the

needs of the student and the student's academic goals for the year. I started with interviews with one general education teacher, two special education teachers, and one case manager. After these initial interviews, I asked for additional interview contacts that worked with the students. At this point, I emailed those teachers and then completed interviews with them. In School One, I interviewed Mrs. Mallard a case manager, Mr. Pine a special education teacher, and Mrs. Perry, a general education teacher. Mr. Pine and Mrs. Perry co-taught sixth-grade math. I also interviewed my focal student, Mike, about his technology usage. In School Two, I interviewed a special education teacher, Mr. Pintak, and a general education teacher, Mrs. Credence. Mr. Pintak co-taught with Mrs. Credence to fulfill IEP requirements for the focal student. I asked the focal student, Billy, questions about his iPad usage. In School Three, I interviewed Theresa, the focal student, and two teachers that worked directly with her. I asked Theresa three short questions due to her lack of communication abilities. Then, I interviewed Mrs. Mellet, a special education teacher, and Mrs. Chancy, Theresa's one-to-one aide. Theresa's mother also answered interview questions via email. I did not interview other teachers at this school because Theresa rarely spent time in the general education classroom due to her needs. Finally, I interviewed Mrs. Tindle, the general education teacher, at School Four. She was the focal student, Ben's, fourth-grade teacher.

I gathered information from the interviews about the usage of iPads in the classroom, specifically how the teachers used iPads to support the student in accomplishing his/her goals. I conducted one interview with each of the different team members. Teacher team members included the special education teachers, general education teachers, case managers, paraprofessionals and teacher's assistants. I

conducted additional interviews with three student users and one email interview with a parent/guardian. For students with complex communication needs, I simplified questions to yes/no responses or one-answer responses and allowed for the usage of a PECS System or the Proloquo2Go app. See Appendix B for the interview guides. These interviews focused on similar questions to see if there was alignment between what the teacher said and what actually occurred in the classroom. I conducted about two to four interviews per participant group. In the four groups, I had 12 interview participants. I recorded and transcribed each of the interviews immediately after the interviews took place.

I interviewed seven general education and special education teachers, as well as one one-to-one aide. I conducted multiple interviews per each student participant. I also conducted interviews with the student participants. Student interviews lasted between 4 and 10 minutes; teacher interviews lasted between 15 and 35 minutes. The interviews took place within the fall and winter of 2015. I also conducted follow-up interviews with five of the teacher participants. The other participants did not respond to the follow-up questions. The questions from the interviews provided information about the usage or non-usage of technology in the classroom, how the teachers learned to use technology, how they used technology, and the access and support that assistive technology brought to students with disabilities.

Observations. After I completed the interviews, which was about two months after initial contact, I moved on to the observations to see what occurred in the classroom regarding iPad implementation and to better understand how the implementation practice helped the student's needs or academic goals. I completed observations during fall and

winter 2015. The observations I conducted included one teacher or multiple teachers co-teaching. I provide detailed information about the observations I conducted, in Table 3.

Table 3

Observation Information

Number of Observations	Date/Location	Length	Participants
Everly District (6)	10.23.15-math class	30 minutes	Observation 1,2,3, 5- Mr. Pine, Mrs. Perry, Mike Observation 4-Mr. Pine, all sixth-grade teachers, Mrs. Perry, Mrs. Mallard, Mike Observation 6- Mike, Mrs. Mallard, additional sixth-grade teacher
	10.29.15-math class	30 minutes	
	11.4.15-math class	30 minutes	
	11.9.15-cafeteria	30 minutes	
	11.18.15-math class	42 minutes	
	11.23.15-mixed class	42 minutes	
Wellington District (7)	11.5.15-handwriting	30 minutes	All observations- Mr. Pintak, Billy, Mrs. Credence
	11.5.15-math class	50 minutes	
	11.6.15-math class	55 minutes	
	11.17.15-handwriting	30 minutes	
	11.17.15-math class	50 minutes	
	12.2.15-math class	30 minutes	
	12.2.15-resource room	40 minutes	
Littleton District (6)	11.2.15-math class	35 minutes	Observation 1-Mrs. Chancy, Theresa Observations 2-6- Mrs. Chancy, Theresa, Mrs. Mellet
	11.10.15-science and social studies class/resource room	30 minutes	
	11.20.15-resource room	43 minutes	
	11.23.15-resource room	35 minutes	
	11.30.15-resource room	30 minutes	
	11.30.15-resource room	42 minutes	
Cedar District (2)	11.10.15-homeroom	35 minutes	All observations- Ben, Mrs. Tindle, one-to-one aide
	11.24.15-homeroom	27 minutes	

In School One, I observed co-teachers in a math classroom and multi-grade level teachers in a whole group setting. I observed four of the six times in math class; math class proceeded in the same fashion with a review of the agenda, review of homework, and introduction to new homework.

In School Two, I observed co-teachers in ELA and math, along with resource room teaching with the special education teacher. During the two ELA sessions, students worked on handwriting and used the iPads to practice cursive writing. Three observations of math focused on measurement and math units. I conducted the last observation in the resource room where the student practiced his math units using an iPad game.

In School Three, I observed the one-to-one aide working with the student. The first observation started in the student's co-taught math classroom and the second observation started in Theresa's co-taught science and social studies classroom. During each observation, Theresa left the classroom and continued her work in the resource room. During the four times that I observed in the resource room, Theresa embarked on activities that kept her focused and occupied.

In School Four, I observed the general education teacher leading morning meeting while the one-to-one aide worked with the student. After two observations in this classroom, the teacher prompted me to continue my observations in the speech room, but the speech teacher did not consent to observations, so I was unable to return to that school to finish any more observations.

I conducted observations during various points throughout the day to incorporate different content and instructional times. I tracked iPad usage location, who implemented

the usage, the activity associated with usage, a description of its usage, the duration, and the related goal regarding the IEP (see Appendix C). I observed for the length of the instructional time, not exceeding one hour per observation. I conducted six to seven observations for three of the participant groups. I concluded one participant group after two observations because the teachers stopped communication. I observed over a six-week period. Following the observations, I emailed teachers with any questions that I still had about their teaching strategies and integration of technology. Finally, to understand the student and classroom occurrences, I conducted a document analysis of their IEP. I looked at the services they received and their goals. I gained access to two IEPs from School Two and Three and School One verbally told me about the IEP. I answered the research questions using different forms of data.

I used data gathered from the observations to help me better understand these questions. I observed how the teachers used iPads to support the needs of the student. I determined the relationship between the activities that occurred in the classroom and the student's needs and/or goals as stated in his or her IEP and expressed through the interviews. I looked at the IEP for individual student goals and needs and interviewed participants. These methods helped me look at relationships between activities and needs. I defined relationships as instructional activities that supported the student in accomplishing a specified need or individual goal.

Instrumentation

I conducted the semi-structured interviews with student users and teacher teams. I also conducted one parent interview. I conducted the interviews before, during, and after observations. I asked each participant group similar questions, but I framed each

question to fit the participant and the context. I developed the interview protocol, found in Appendix B, based on the different participant groups as well as the research questions. I focused the interview questions on what “support” means and looks like, what “integration” means and looks like, how iPads support student needs, and how iPads open up access to the curriculum. I asked the teachers about themselves as a teacher, their experiences with assistive technology, how iPads helped students in the classroom, and what factors most influenced iPad integration. The interview guide for the parents/guardians included questions on the assistive technology acquisition process, how iPads helped their student access the curriculum, and what they would do differently regarding assistive technology integration. The interview guide for the student users included questions on the types of technology they liked to use in school, how these tools helped them succeed in learning, and the specific experiences they had with iPads in the classroom. If I still had unanswered questions, I followed up with emails. During the observation, I looked at how iPad usage and activities related to specific student needs. I used an observation tool to help correlate classroom activities with student needs and individual goals (see Appendix C). The tool helped to track whether or not the instructional activities and lessons that occurred when the iPad was in use supported specific goals and needs.

Data Analysis

My data analysis involved coding. Through coding I found commonalities in the data, which led to a description and then to an explanation (Johnson & Christensen, 2008). These commonalities became my themes (Table 4). I used the key concepts to lead my preliminary literature search. First, I defined the types of technology used in the

classroom, for example, educational, instructional, and assistive technology. Second, I looked into the influence of technology on student learning and IEP goals, and third I looked at how teachers used iPads as a form of assistive technology. These three areas framed my focus throughout the data collection and analysis process. Through multiple observations and interviews, I gained a better understanding of the classroom concepts and constructs regarding the usage of iPads as assistive technology. I used my initial codes in creating the interview protocol and observation tracking tool. I asked specific questions about participants' usage of technology, specifically assistive technology. I also asked about the benefits of iPad usage as a form of assistive technology. When I observed, I looked at how the teachers integrated iPads into the classroom, how often the students used iPads, and the educational outcomes associated with the usage. These preliminary ideas and focal points from the theoretical framework and key concepts became my initial codes.

To analyze the data from the interviews and observations, I analyzed transcripts and field notes. I coded the transcripts and field notes, looking for pertinent ideas and themes. I printed out each transcribed interview, typed observational notes, and then highlighted words that related to my initial codes. I then created headings in the margins for how these words all related. I looked at the themes and descriptors that appeared throughout the observations and interviews. I also used open coding to find codes that reappeared throughout the data that I had not captured with my initial codes (Bogden & Biklen, 2007). This included words that I found repeated throughout the interviews and observations. These became my categories and sub-categories. I also analyzed the tracking tool. I used the tracking tool during the observations to track iPad usage, who

was using it, the activity associated with the usage, usage duration, and the goal. Once I filled out the tracking tool from the observation, I then compared it to the interview questions. I compared the goal section of the tracking tool to the goals stated in the user's IEP. I provide a visual of the tracking tool and the results in Appendix C.

When I analyzed the data, I found variations that helped me to form Chapters Four and Five. For the analysis chapters, I analyzed the data by coding throughout the transcription process. From my initial codes, I created categories with sub-codes. Table 4 provides a list of the codes I used throughout the analysis process.

I started with constructs that I defined (initial codes) and then used these codes when analyzing my data. My initial codes included various definitions of technology, the influence of technology, and how teachers use iPads as a form of assistive technology. I then created categories based upon the data. The categories included experiences with assistive technology, promotion of inclusivity, why not to use technology, benefits of technology, how iPads are used, and forms of assistive technology. After reviewing the categories, I pulled out major themes that appeared. The major themes included visual access, universal usage, playing for fun, non-usage, and teacher practices vs. teacher beliefs. I refined these categories and themes as I continued to analyze the data from the interviews, observations, and document analyses. I refined these categories and themes to determine sub-categories and themes. When I refined the categories and themes, I found that the two other parts of my theoretical framework, ableism and presumption of competence, became evident. My sub-categories included: assistive technology used, technology used, assistive technology knowledge, teacher perceptions, learning curves, distractions, planning ahead, how technology supports student access, engagement,

motivation, reinforcement, game playing, repetition, universal usage, visual models, individualization, promotion of independence, and accommodations. My sub-themes included uses in different settings, individualized usage, visual stimulation, motivation, occupying time, distractions, pedagogy of competence, and pedagogy of participation. I depict these codes in the table below.

Table 4

Data Codes

Initial Codes	Codes & Sub-codes from Data	Coding Themes	Codes not Related to Technology Use
Types of Technology	-Experiences with Assistive Technology <ul style="list-style-type: none"> • AT used • Technology used • AT Knowledge 	Chapter Four -Visual Access <ul style="list-style-type: none"> • Uses in Different Settings -Universal Usage <ul style="list-style-type: none"> • Individual Usage • Visual Stimulation • Motivation -Playing for Fun <ul style="list-style-type: none"> • Occupying Time -Non-usage <ul style="list-style-type: none"> • Distraction Chapter Five -Teacher Practices versus Teacher Beliefs <ul style="list-style-type: none"> • Pedagogy of Competence <ul style="list-style-type: none"> ○ Individualized Learning ○ Repetition & Reinforcement • Pedagogy of Participation <ul style="list-style-type: none"> ○ Teaching Strategies 	-Choosing Teaching Characteristics of a Teacher -Teaching Strategies
Influence of Technology	-Promotion of Inclusivity -Why not to use Technology <ul style="list-style-type: none"> • Teacher Perceptions • Learning Curve • Distraction • Involves Planning Ahead -Benefits of Technology <ul style="list-style-type: none"> • How Technology 		

	Supports Student Access
	<ul style="list-style-type: none"> • Engagement • Motivational
iPad Usage	-How iPads are Used
	<ul style="list-style-type: none"> • Reinforcement • Game Playing • Repetition • Universal Usage • Visual Models • Individualization • Promotes Independence • Provides Accommodations
	-Form of Assistive Technology

I wrote memoranda after I reviewed the codes and came up with my coding themes (Bogden & Biklen, 2007). These themes became the foundation for Chapters Four and Five. I included a narrative of the students and their stories in Chapter Four and I focused Chapter Five on the overlapping themes across the different student and teacher participants. To implement this type of research, I studied the individuals and looked at their observation records and interview protocols, gathered data from their stories, and reported their individual experiences and the meaning of those experiences (Creswell, 2012). For Chapter Five, I used my categories and sub-categories to create themes, and then I wrote across those themes.

Trustworthiness

Guba, as stated in the research of Shenton (2004), considered four criteria to ensure trustworthiness in a study. The four criteria included credibility, transferability, dependability, and confirmability. Regarding credibility, I wanted to ensure an accurate

representation of their experiences (Shenton, 2004). I accomplished this with different data gathering methods such as interviews with different participants, observations, detailed descriptions of what occurred, and my own reflective commentary as researcher (Shenton, 2004). The different sources of data also helped with triangulation. I collected data from multiple sources and over an extended period (Mawson, 2007). I ensured trustworthiness through the transferability of the study, how it applied in other situations. I addressed transferability by accumulating data across settings and in multiple environments (Shenton, 2004). The different settings included collecting data in suburban and rural schools throughout kindergarten-sixth-grade environments. I utilized multiple environments because the observed participants taught in any inclusive classroom environment whether that be a homeroom classroom or a content area classroom. In Table 5, I include a depiction of the demographics of the schools and participants. This created a stronger transferability that enabled me to gain a more inclusive, overall picture. I addressed dependability through the detailed process of the study (Shenton, 2004). The research included in-depth coverage of the methods. I included the planning and execution, as well as the evaluation of the effectiveness of the process (Shenton, 2004). Finally, I addressed confirmability of the study to determine that the findings were a result of the experiences and thoughts of the participants (Shenton, 2004). By addressing the four criteria presented in the article by Shenton (2004), I addressed reliability and validity through the concept of trustworthiness.

Table 5

Participant Demographics

	School Population	Ethnicities	Free/ Reduced Lunch Rate	Participant Ethnicity
Everly	4,556	American Indian 1% Black/AA 3% Hispanic/Latino 3% Asian 1% White 89% Multiracial 3%	19% Free 5% Red.	Mike- Hispanic
Wellington	449	Black/AA 0% Hispanic/Latino 2% Asian 0% White 92% Multiracial 4%	46% Free 10% Red.	Billy- White (Central European Immigrants)
Littleton	7,167	American Indian 0% Black/AA 9% Hispanic/Latino 5% Asian 5% White 75% Multiracial 5%	34% Free 6% Red.	Theresa- White
Cedar	1,911	American Indian 0% Black/AA 1% Hispanic/Latino 3% Asian 1% White 92% Multiracial 3%	32% Free 7% Red.	Ben- White

Ethical Considerations

This study looked at the teaching practices and strategies used in inclusive settings. I examined a few ethical considerations because I conducted the study in an educational setting with a specific type of population. According to IRB (Institutional Review Board), I needed a letter of co-operation because I conducted the study in schools. In the letter of co-operation, it stated that parents had the right to inspect administered surveys and instructional materials, arrange to protect student privacy, and question physical examinations or screenings. According to IRB, my research involved human subjects, so participants needed to provide consent and assent (Appendix A). The consent and assent forms ensured that I did not use the research to reveal any political affiliations, mental and psychological problems, sex behavior and attitudes, demeaning behaviors, critical appraisals, confidential relationships, religious affiliations, or matters related to income or financial assistance. The student users were under the age of 18, so their parents and/or guardians needed to provide consent for them. The other participants (teachers and parents/guardians) were over the age of 18, so they consented for themselves. This study involved students with an identified disability and ones who currently had an IEP. Since my student users were children, the IRB considered them a vulnerable population. I filled out an additional form to ensure that this research posed no greater than minimal risk to children.

All participants had the opportunity to consider whether to participate in the study. I provided participants with a prior understanding of the basic elements of the research process. I gave them ample time to review consent forms. The consent form included information regarding the option to opt out of participation initially as well as

the option to withdraw during any part of the research process. Also, during the interviews, I provided wait time for the participants to answer any questions. To avoid coercion, I explained that participation in the study was voluntary, and they could withdraw at any point. I made myself available through email or phone to answer any questions and concerns along the way. It was my goal that participants had a full understanding of the scope and goal of the research. I conducted research only with the willing involvement of the teachers, students and parents/guardians. I welcomed any questions throughout the research process and answered them promptly.

Informed Consent and Confidentiality

I informed participants of the study through the informed consent process (Appendix A). Once I identified teams of teachers, I approached them with the consent letters, and they either agreed or disagreed to the observations and interviews. I also provided parents/guardians with consent forms to sign off on participation in interviews, their children's participation in observations and interviews, as well as granting permission to look at the student's IEP. I gained access to two out of the four IEPs. I read student participants their assent forms along with parental consent. In addition, to ensure the confidentiality of all participants, I used pseudonyms in place of proper names and academic institutions in my writing.

This study involved minimal risk, including uncomfortable feelings. I easily avoided these risks by reminding participants of their rights to interrupt or withdraw from the study. The social benefits of my study outweighed the risks as they included an appreciation for the participant perspective and their contribution to the knowledge base through the publication of the study. Overall, I conducted the interviews with all

participants presented, with no more than minimal risk to the human subjects; identification of subjects and/or responses did not place the participants at risk.

Description of Participants

Multiple schools, teachers and students participated in this study. I also offered parent interviews but only one parent agreed to answer questions. Below I include a description of each student along with the teachers, and in one case parent, related to that student.

Participant Profiles

The following section describes the four student participants. Within each participant profile, I also describe the corresponding teachers and the one parent that took part in the study.

School One: Student. Mike was an 11-year-old boy who attended sixth grade at School One. He was of average height for a sixth-grade boy and wore glasses to help with his vision. Since I could not access his IEP, his case manager shared certain aspects of his academic needs with me. Mrs. Mallard was Mike's case manager. She coordinated Mike's services and sat on his IEP committee. She stated that he had a visual impairment. He received inclusive services at the school with pullout to the resource room. He had two teachers for math, Mr. Pine and Mrs. Perry. Mr. Pine was the special education teacher that worked with Mike and pushed into his classes. He handled Mike's resource room time. Mrs. Perry was Mike's general education teacher.

Mike used a form of assistive technology to aid his sight. His case manager told me that he used a screen magnifier, enlarged keyboard, enlarged software, a computer, and access to an iPad. This meant that he could access the Promethean board in order to

complete written assignments. Mike received consultant teacher services, testing accommodations and program modifications that provided access to a teacher of the visually impaired, usage of a screen magnifier, enlarged print and instructional materials, manipulatives, and access to a word processor to type responses longer than a paragraph. His teacher shared one specific goal related to the usage of his technology in the classroom. His vision goal stated that given an assignment or task, he would access the technology required to complete the task with 75% success on three consecutive occasions.

Mike was a very outgoing and sweet boy. When introduced to me, he was excited that I was going to come and observe him and his iPad usage. He mentioned to his case manager that he liked using the iPad. During the times that I observed Mike, it was evident to me that he had many friends in the classroom. Often before class started, Mike talked to the other boys in the class. He used the iPad to access the information presented in class so that it showed up on his screen. He also used it to take pictures and zoom in on the information.

School Two: Student. Billy was a second-grade, eight year-old boy and identified as having autism. He had dirty blonde hair and was of average height and weight for a second-grade boy. He was a student in an inclusive general education classroom with push-in support. A teacher's assistant provided enhanced staffing during certain times of the day. Mr. Pintak, his special education teacher, pushed into the classroom multiple times throughout the school day through indirect and direct consultant teacher services. He also pulled Billy out for resource room and special class for an hour and a half each day. Billy only received special education services and/or programs

throughout the academic school year. Mrs. Credence was Billy's general education teacher.

According to Billy's IEP, he had shown growth in all academic areas and specifically enjoyed typing. The IEP stated that small group and individualized work groups allowed Billy to participate and focus on learning and create bonds with his peers. Billy noticed concepts when provided with repetition and practice. He relied heavily on adult prompting to encourage and sustain independent work. Visual models and adult prompting helped him in school. Billy had 13 annual goals listed on his IEP, including ones for reading, writing, mathematics, speech and language, social/emotional/behavioral skills, motor skills, and daily living skills. His testing accommodations included tests administered in a location with minimal distractions, revised test format, on-task focusing prompts, and clarified directions. The IEP stipulated that he participate in the same State and district-wide assessments of student achievement that teachers administered to the general education students. His IEP stated that he did not need an assistive technology device for any part of the day. The usage of an iPad with Billy was the choice of the general education teacher and the special education teacher and proved to help him enhance his academic skills.

Billy was a very happy-go-lucky boy. He followed directions and worked diligently to get his work done. He showed empathy for his fellow students. He noticed when something was different. During one interaction, he noticed I was sitting at the teacher assistant's desk and asked if I was her substitute. After I had replied "no" and that I was just trying to learn more about math, he continued to do his work.

School Three: Student. Theresa was a ten-year-old, fifth-grade student and classified with Autism Spectrum Disorder. Her IEP stated her as “ungraded.” Her IEP provided services both within the inclusive classroom and services pulled out in the resource room. She received integrated co-teaching services for math, ELA, science, and social studies. Mrs. Mellet was her special education teacher. Mrs. Mellet provided Theresa with her services, accommodations, and modifications. She also had a one-to-one aide that accompanied her in every classroom. Mrs. Chancy was her one-to-one aide; she provided all of Theresa’s instruction. She received occupational therapy, speech and language therapy, and physical therapy. From her IEP, her committee stated that she was showing good academic and social gains, which moved her from a 12:1:1 special class to her current inclusive classroom. Theresa’s significant academic delays and limited verbal skills allowed her to continue receiving special education services within an inclusive co-taught classroom throughout a 12-month school year. Theresa was currently at a first-grade reading level and could answer basic who, what, where and yes/no questions when given visual cue cards. Theresa was easily frustrated and responded well to frequent breaks and calming techniques such as sensory breaks, deep pressure, and deep breathing. She wore pink headphones on her ears whenever she was in a classroom or transitioning. She did not wear the headphones when she was with fewer students in the resource room. She became upset when she did not get her way, and at that point, she pushed, hit, or punched her one-to-one aide. She responded better to a highly structured learning environment with specialized instruction and clear and concise expectations. She needed frequent redirection to remain on task and within designated areas. From observations, when she was in the classroom, she separated herself away from the other students at her

own desk and did her own work. In the other classroom that I observed, she sat with another group of students in a desk cluster, but adjacent to her one-to-one aide.

Theresa was a very smart girl who understood what was going on in the classroom and could follow along when presented a sequence of activities. When provided tools, she used a schedule reminder on her iPad and a PECS board that presented her with the sequence of events. The aide reminded her of these activities and then the teachers expected her to vocalize back what the aide said. When asked questions about the activities that she was completing, she was able to answer the prompting questions. She mainly used the iPad to play games and occupy her time.

Theresa had seven annual goals listed on her IEP with 11 sub-goals. Her goals focused on building upon her reading, writing, mathematics, speech/language, and motor skills. The teachers provided various supplementary aids, services, modifications, and accommodations to Theresa. These included the usage of visual cues, a structured learning environment, specialized instruction, refocusing and redirection, a teaching assistant, additional wait time to respond, noise canceling headphones, access to a computer for visuals, and accessing the curriculum at her independent level. Theresa participated in alternative assessments for New York State. The teachers provided multiple testing accommodations including on-task focusing prompts, tests administered in a location with minimal distractions, usage of arithmetic tables, and having all content read. I was able to interview not only Theresa, but also her mother, Mrs. Fairfield.

School Four: Student. I was unable to obtain detailed descriptions of Ben due to the limited number of observations and lack of access to his IEP. Ben was a fourth-grade student who was currently non-verbal but made vocal noises. He was bigger than most of

the students in his grade. I assumed that he was around ten years- old. According to his IEP, he had autism. He had short brown hair. He had a one-to-one aide who accompanied him to all classes and sat next to him in class. I interviewed Ben’s teacher, Mrs. Tindle. According to Mrs. Tindle, his primary usage of the iPad was for communication purposes. I provided an overview of the participant profiles in the table below.

Table 6

Participant Profiles

	School One Everly District Public-Suburban			School Two Wellington District Public-Rural		School Three Littleton District Public- Suburban		School Four Cedar District Public- Suburba n
Student	Mike Sixth grade Visual Impairment			Billy Second grade Autism		Theresa Fifth grade Autism		Ben Fourth grade Autis m
Parent						Mrs. Fairfield		
Teacher	Mrs. Mallard Case Manage r	Mr. Pine SPE D	Mrs. Perr y Gen. Ed	Mr. Pinta k SPED	Mrs. Credenc e Gen. Ed	Mrs. Mellet SPED	Mrs. Chancy 1 to 1 aide	Mrs. Tindle Gen. Ed.

Conclusion

In Chapter Three, I provided an overview of my research methods. In the first part, I focused on the qualitative research tradition. The second section focused on the set up of my project including the design of my study, selection of participants,

procedures for implementation, instrumentation used, analysis, establishing trustworthiness, ethical considerations and confidentiality. The final section focused on the description of the participants used in the project. In this chapter, I provided the reader with a background on this research project before learning about the project's results. The next chapter will focus on the stories of the four students I observed and their iPad usage. Mike used the iPad to gain visual access to the general education curriculum. Billy used the iPad just like all other students: as an alternative to paper-pencil activities. Theresa used the iPad for various reasons like playing games, watching videos, and drawing. The teachers used the iPad as a way to occupy Theresa's time. Finally, Ben needed to use the iPad for communication access but rarely used the iPad in the classroom. I depict my analysis of the four participants through stories presented in Chapter Four.

CHAPTER FOUR: STUDENT IPAD USAGE

Participant's Stories

I saw technology usage and the usage of iPads in each of the schools where I conducted my study; however, there was little connection between device usage and student IEP goals and needs. The iPads played a role in how the students participated within the classroom due to the ease of access. The events that occurred during the observations and interviews revolved around how the teachers integrated the devices with each of the students. In this chapter, I illustrate each student's iPad usage through four different stories.

This chapter focuses on the stories of the four students and their iPad usage throughout all of their observations. Mike from the Everly District used the iPad to gain visual access to the general education curriculum. His iPad usage helped him visually access the content. The teachers in this school made strides toward full integration during math time, but his usage was inconsistent throughout the rest of the school day. Billy from the Wellington District used the iPad just like all other students. The teachers used the iPad as a twenty-first-century tool to engage and motivate their students, as an alternative to paper-pencil activities. Theresa from the Littleton District used the iPad for various reasons like game playing, watching videos, and drawing, which were all unrelated to the content that the other students learned. The teachers used the iPad as a way to occupy Theresa's time. Finally, Ben from the Cedar District needed to use the iPad for communication access but rarely used the iPad in the classroom. He did not use the iPad when I was present in the room. I present each of the students and their different stories of iPad integration.

Now I Can See

Mike was a sixth-grade student that received educational instruction within a co-taught classroom in the Everly District and used his iPad for visual access. His main IEP goal related to vision due to his visual impairment. The technology allowed him visual access to complete assignments and/or tasks. He had access to an iPad throughout his entire school day, but Mike was the only student in a class of nine girls and 12 boys that used the iPad. Mike had one particular goal in his IEP that directly related to his usage of the iPad. His vision goal called for him to access technology for an assignment or task so that he could complete a task with 75% success on three consecutive occasions.

Technology integration for a vision goal would be an example of the most basic level of access. Although his teachers made strides in integrating the iPad into everyday usage, they still worked toward integrating the iPad into his entire academic day and across multiple settings, moving beyond just using it for visual access. His access to technology was the most basic level of access because he either used it to help him see the content or did not use it at all.

In order for Mike to access the content that his teachers presented, the school provided an iPad. Mike used the iPad to connect to the Promethean board through the join.me app. He also used different apps, like the camera and photo app, to screen capture and enlarge materials. Mrs. Perry, his general education math teacher, explained that he used the iPad more often and now that he depended on it more, they discovered that he needed more training to move beyond using the iPad for just join.me.

Every time that Mike used the iPad, he used it to help him access the curriculum whether that was for enlarging the material, connecting to the Promethean board, or

watching videos. Mike's teachers used the iPad to help him visually access math material, which did not happen 100% during math class time. The following sections explain Mike's basic level of access.

Just making it bigger. Mike used the iPad in multiple ways during his math class to access the content and curriculum. Mike worked directly with his co-teachers, Mr. Pine and Mrs. Perry, during the math observations. Math class was 42 minutes long with the same schedule every day. The students walked into the classroom and referred to the posted agenda on the Promethean board. In addition, to the right of the Promethean board, the teacher posted the agenda on the chalkboard. The agenda called for the students to write in their planner, take out their DIN (Do It Now) and homework, and then put everything else under their chairs. For the four math classes that I observed, Mike sat at the front of the classroom, next to another student. There were groups of two desks so that students had readily available partners. As the students entered the classroom, the teachers prompted them to get ready for the class period. The students then read the agenda on the board, filled in their planner with the next day's homework, handed in any work, and took out their necessary papers that they needed at that time. The activities that Mike participated in throughout the day were the same as the other students in the classroom. The only difference was that Mike used an iPad whenever he needed to see the projections on the Promethean board.

Mike connected to presentations on the Promethean board by using his iPad and the join.me app, which then projected whatever the teacher's computer projected. Mike's teachers allowed him to use the join.me app because it provided a magnification of the material on his iPad. The app also allowed connections between different parties'

computers to video and audio conference, created mobile connections, recorded, scheduled, swapped presentations, transferred files, and shared screens. Mike's team of teachers used this technology to share screens so that he could participate in class discussions. During the interview with Mr. Pine, he explained how the iPad opened up access to the curriculum:

Well for this student in particular with the visual impairment, it just makes it so he can see it. So that is the biggest thing. If we have the luxury of getting the content on the iPad, then he doesn't have to have that big, giant piece of paper next to him. And so if you have it all on the iPad, it can help with the organization and freeing up that workable space for him. It makes it so that he can access the content that the teacher has presented and also to turn work in paperless, which I think is pretty awesome.

In addition to Mike's iPad usage, the teachers also used enlarged worksheets. Before technology devices, teachers who had students with visual impairments in their classroom had to print magnified worksheets so that students could see the print easier. Mike's teachers still used these magnified worksheets with Mike when the worksheets were not in a digital format.

In order to access join.me, Mike waited for Mrs. Perry or Mr. Pine to hand him a sticky note with the login information, as the code changed for each conference session. They placed it on his desk or gave it to him at the beginning of class to ensure anonymity. The teacher who set up the conference received the code and then provided it to Mike. The post-it note strategy was something that Mrs. Perry inherited from trial and error with a different student the previous year. She explained the transition:

Last year we used it a little differently. We used this free app, and I learned how to do it just kind of on the fly with my iPad. Then we figured out that hers [her iPad] would work so we had her charge it in my room and then it was all the little things that mattered a lot like she did not want to be different, so it meant coming in a little early, getting her onto the program and then having a little sticky note with the code kind of either already on her desk or casually walking around and

stick it on so that she could just casually log on. It took a little tweaking, but now I feel like I have my system. I have the sticky note on my computer so I can remember, remember, remember.

Mrs. Perry continued using this strategy on a daily basis with Mike and his iPad. She provided him with a sticky note with the login information. After logging in, he accessed the board and saw the DIN for the day. For each of the four observations, it took Mike anywhere from 1-5 minutes to log in to join.me depending on if his iPad was on and ready to go. At that point, he then worked on the DIN, but that meant that he was already behind the other students in the classroom. In addition to using the iPad for connecting to the Promethean board, I also observed Mike use the iPad for research purposes.

iPad as a research tool. Mike used the iPad to access videos during a PBL activity. The PBL activity was a Project Based Learning activity, which involved the students working together to investigate authentic, real-world problems. This Project Based Learning activity had the students brainstorming ideas on how to make a greener school. After viewing the video, he was able to go beyond using the iPad for accessing visuals to using the iPad for research. Before the research started, Mrs. Mallard prompted Mike to log in to join.me so that he could view the video. The teacher leading the class had the app already downloaded onto her computer. Since both the teacher and Mike used join.me, Mike was able to view the video. Mike logged into the app and then brought the video up on his iPad. He watched the video via the iPad so that he could see and hear it better. After the video, the students moved on to collecting research for their topic. Since Mike had an iPad, the group members had the advantage of each having a piece of technology to do research. The two girls had a Chromebook, and Mike had his iPad. Both the math example and PBL example showed how teachers provided basic

access to Mike by allowing him to log in to the join.me app. This type of iPad usage was another example of computer usage and did not include any adaptive usage.

Mike's math teachers felt very comfortable with Mike using the iPad to connect to the Promethean board. They had used the join.me app in the past with a student, so it was easy for them to use the app with Mike, as well. Since they were familiar with the log in process and allowed Mike to view the screen through his device, they did not have to learn how to use the device in a different way. As a result, the teachers stifled Mike's access opportunities because they never learned how to integrate the device in various manners. The device allowed Mike to engage with the class by connecting him to what the teachers presented, but if the teachers did not present information via the Promethean board, then Mike had to troubleshoot the situation.

The missing link. Mr. Pine and Mrs. Perry seemed very comfortable having Mike use his iPad in math class, but not all teachers used the iPad in this way. These teachers compromised Mike's access to the content. During certain times in math class, Mrs. Perry had students present their answers to the DIN (Do It Now) and the homework through the document camera. The document camera projected what was on the station, but there was no connection between the Promethean board and the document camera. Therefore, at this point in the lesson, Mike was unable to see what the students projected. Since the teachers did not provide any other accommodations, Mike had to figure out how to troubleshoot the situation without the usage of his iPad. Mike had a choice; he could remain seated at his desk listening, walk closer to the board, or take pictures of the projections. During one observation, Mike used his iPad to take a picture of the board and then used the zoom in feature to see the projected work up close. Mike learned how

to remedy the situation of non-access by using the photo app. He explained to me that he liked to use the photo app because it was fun and educational.

KN: You like taking pictures? Why?

Mike: I really like taking it because I feel like I am a photographer.

KN: Does it help you with your learning as well?

Mike: yeah

Mike learned that he could take a picture of the information projected on the screen and then zoom in on that picture, which allowed him access to the content. This in-the-moment adaptation worked for Mike to heighten his access, but the teachers never promoted or prompted this adaptation. When Mike took a picture of the board, neither teacher expressed to Mike that what he did was a great alternative to not participating or not seeing the board. Using the iPad as a way to access the presented information by taking a picture could be a great on-going solution to non-access, but the teachers did not promote or use the iPad systematically with Mike.

Another way that Mike increased his access was by choosing to walk up closer to the Promethean board to see the projections in a closer range. Mike made the decision to either approach the board to see the visually presented material or sat and listened to the explanations. Neither the teachers nor students seemed to have a problem with Mike getting out of his seat and approaching the board. This happened in each of the math classes that I attended. The teachers neither promoted nor prompted this accommodation as a way for Mike to access the information. The accommodation that Mike made on his own was not systematic and ongoing, thus only occurred when Mike took the initiative. Promoting the usage of the iPad in this manner could be a way for the teachers to provide on-going access for Mike. Not only did the teachers affect Mike's access in math but also in other settings that I observed.

Different settings, different uses. The teachers in Mike's math classroom used the iPad consistently for Mike to access content, but this was not the same situation in other classroom settings. During the same Project Based Learning lesson with the entire sixth grade class, the teachers provided no visual access for Mike with the iPad.

Before the lesson started, Mr. Pine gave me a little background information about the project and told me that Mike was not using the iPad. He explained to me that the teacher leading the group discussion did not prepare for Mike to be there and use the iPad; therefore, she had not downloaded join.me on her laptop. During this lesson, the teachers showed a video where Mike needed to connect to the join.me app to see the projected video. The teacher put a movie on the projector about growing a greener school. Mike sat in the back of the room where he was unable to see the video. As a result, he got up and switched seats with an aide that sat closer. He took the initiative to move to a different seat so that he could see and hear the video since he did not have access to his iPad during that time. Since the teacher's computer did not have join.me on it, Mike made the decision, without any teacher prompting him, to move closer to the screen.

The above observation provided an example of how if the teachers did not think about Mike's needs first, then Mike had to figure out how to access the content on his own. The usage of the iPad with different teachers and in different settings was not consistent, thus the basic level of access for Mike never occurred.

Conclusion. Mike's iPad usage involved using the device as a tool, at the most basic level, to access the general education curriculum. According to Mike's IEP, he needed the device to help him visually access instructional material. His teachers used

the join.me app to help Mike connect to each teacher's computer. Once connected, Mike viewed the projected material on his iPad. During my interview with Mike, he explained to me how the iPad helped him learn. "There is something called join.me. It helps me join someone. And um for math, um any class really. You just punch in a code, and it will be there in seconds." This meant that in order for Mike to participate in class he had to be in charge of knowing how to maneuver around the device and log in to different apps.

The teachers' integration of the iPad provided Mike with one dimension of access. The teachers felt comfortable allowing Mike to use the device to view the Promethean board but never pushed Mike to use the device in other ways. Mr. Pine explained to me that the teachers still worked on fully integrating the iPad into Mike's academic day. In a passing conversation with Mr. Pine, I asked why at certain times the teachers did not use the iPad or chose to use different forms of presentation where the iPad did not connect. He explained, "This is a perfect example of [a] lack of planning ahead." The teachers did not plan for technology usage. He explained it as precedence. For example, the teacher showed the homework and how the other students completed the homework via the document camera. To incorporate the join.me app, it required the teacher to know which student's homework she was going to show so that she could scan that homework into her computer and then project it onto the Promethean board.

The teachers provided Mike with the necessary tools to initiate the usage of his iPad, like providing him the login information when he needed it, but they never went beyond this basic level of access for Mike. As the literature explains, teachers need to expand in their knowledge of how to integrate devices in different ways to support the

needs of individual students. Teachers need to move beyond using technology at the basic level and push themselves to create meaningful experiences for their students (Galloway, 2010). As Galloway (2010) pointed out, technology usage should be student-centered and facilitate innovation and value.

I viewed Mike's story through the SAMR model of technology integration. The SAMR model focused on the transformation of lessons through technology, specifically through substitution, augmentation, modification, and redefinition (Kihoza, Zlotnikova, Bada, & Kalegele, 2016). The researchers explained that as a teacher moved from substitution to redefinition, they moved from using technology as an enhancement to using it to transform instruction (Kihoza, Zlotnikova, Bada, & Kalegele, 2016). Mike's teachers were at the initial stages of technology integration and did not push themselves to move beyond the substitution level of the SAMR model. They had simply substituted magnified papers for the join.me app on the iPad.

Billy's Universal iPad Usage

Billy was a student in the Wellington School District in an integrated second-grade classroom, but the previous year, Billy was in a 6:1+1 special class. For the 2015-2016 school year, the teachers used his previous IEP that stated he receive resource room program through small group instruction 30 minutes every day as well as indirect consultant teacher services for 20 minutes every day. At the time of the observations, Billy was eight years old and identified with autism. He was one of nine boys and ten girls in the classroom. His IEP did not mandate any communication services, yet it stated that there be push-in and pullout services provided by the special education teacher for content area mastery. Therefore, the special education teacher pulled him out during his

instructional day for one-on-one resource room instruction, as well as small group instruction with other students. His supplementary aids focused on enhanced staffing. The IEP did not list any assistive technology need. However, this district had a technology initiative in place that provided one iPad for every student in the prekindergarten-sixth-grade elementary school. Grades 1-6 had iPads in their classroom and Grades preK-K had grade level sets of iPads for classroom usage.

In the second-grade classroom that I observed, students had an iPad that they kept in their desks for use throughout the day. There was a portable charging station at the front of the room where students plugged in their iPads at the conclusion of each day. Billy used his iPad during the same time that the other students in the class used theirs. For example, the students used the iPads for practicing the content that the teacher taught. Billy's teachers initiated his use of the iPad, often connecting specific apps to the content area of concern. Billy's story of iPad usage revolved around the universality of the iPads since every student had access to the devices and used them in similar ways. His use of the iPad had no correlation to his IEP and he used the device for educational purposes instead of for assistive technology purposes.

Universal access and individualized usage. iPad usage in Billy's classroom was the same for all students. The teachers used the devices as twenty-first-century tools to enhance the learning opportunities of all of the students. Mr. Pintak, the special education teacher, worked directly with Billy during specific push-in and pullout services. There was also a teacher's assistant who worked in the classroom part of the day. Mrs. Credence, the general education teacher, worked directly with Mr. Pintak to create an individualized curriculum for the students. She explained that her goal of teaching was to

provide high expectations and to help all students succeed. Technology was a major component that helped refocus attention and get the students invested in their learning.

In the classroom, Billy used the iPad throughout his school day even though his IEP did not list this AT device. Billy's second-grade teacher and special education teacher co-taught classes. One focus of theirs was incorporating Billy's IEP goals. During instruction, they focused on initiation, follow-through, task completion, and attention to verbal instructions. Both teachers provided Billy with fewer prompts so that he became more independent. The iPad allowed for the growth of independence for not only Billy but also all of the second-grade students.

The teachers used the iPads with all students in the classroom, while they individualized the usage to build upon what each student needed. For example, the teacher put students on specific apps knowing that they needed extra focus in that area. During the third observation, the teachers directed the students to complete measurement questions on their IXL app. This app was an individualized-based app that required students to log in to their setting profile. Individual profiles provided personalized skill recommendations, diagnostic information, and analysis of learning. During this observation, the students played games and answered questions about measurement at their independent learning level. Billy needed to work on becoming more independent, so the teachers used the individualized iPad activities to build independence. An example of independence building occurred when Billy played the IXL measurement game. The teachers knew that the game was at his independent level. This meant that he could read all questions and complete the activities. This particular game had him manipulate a ruler and measure lines to the nearest centimeter. During one interaction with Mr. Pintak,

Billy expressed to him the steps that he needed to complete in order to arrive at the correct answer. After reading the question, he stated, “Line it up at the zero.” Mr. Pintak explained, “I am trying to step back and give prompts from a distance so that he is not so dependent on adults. The iPad, during reinforcement/practice, is helpful so that an adult can step back and allow more independence.”

During instructional time, the teachers also used apps to build motivation, appealing to his interests in Disney characters, and apps that were more game-based and interactive. Billy viewed using the iPad as game time. This was evident in the interview I conducted with him. He expressed to me that he liked to use the iPad to play games. As I was asking him questions about what he learned when playing the iPad, he had a hard time distinguishing between playing the game and learning. He told me that he liked truck games, and when I asked him if it was for practicing math or reading, he replied, “reading.” The special education teacher who was sitting nearby when the interview was going on chimed in and asked Billy, “What’s the skill you do with the truck?” Billy stated, “I destroy myself.” The special education teacher proceeded to say, “It’s a math one you goof, and you add.” Then Billy repeated, “Add.” When asked if the iPad helped him learn, Billy answered, “yes.” He also expressed to me that he had an iPad at home where he played games. I think that Billy did not view the iPad games that built upon content as a part of learning. All he talked about in the interview was different games that he played and had a hard time referencing the focus of the game.

Billy also enjoyed using other apps during instructional time, like the whiteboard app and IXL. The purpose of these types of apps were to engage Billy in the content in a different way. For example, after Billy learned how to form the cursive letters of the

alphabet, his teacher then let him practice on the whiteboard app forming the letters. The teachers used the device to individualize his instruction during certain settings because Mrs. Credence saw that the iPad increased engagement, allowed for incentives and motivation, and allowed hands-on learning through a game-like process.

Billy's teachers used the iPad in multiple ways because they were already familiar with the devices and saw the benefits of usage. The teachers' integration of the iPads became a motivational factor for the students. The teachers discovered that the students liked playing on the iPads, thus they integrated instructional iPad games into their lessons to build upon this motivational factor. Mrs. Credence explained in her interview that she used the iPads with all of the students during whole group instruction and small group instruction because she believed that technology enhanced learning opportunities. Mrs. Credence integrated the iPad as a supplemental learning resource. She believed that technology was never going to overtake the ability of a teacher's teaching potential, stating, "...I don't think technology is ever going to replace the human interaction or hands-on activities for kids, but I think it can be used appropriately for remedial...I think it's good for practice and then for supplementing your instruction." I saw the iPads used with all students during independent work time and group instruction.

Visual stimulation and motivation. Mr. Pintak and Mrs. Credence used the iPad as a way to enhance the curriculum and appeal to their twenty-first-century learners. The devices provided a way for them to conduct their lessons so that all of the students engaged in learning the content through the usage of a technology tool. Mr. Pintak and Mrs. Credence liked to use the iPads in a way that engaged and motivated not only Billy but also all of the students. In Billy's case, they knew that he enjoyed "playing" on the

iPad, so the usage of the device was a way for him to engage in the presented material through a different format. The teachers provided instruction by integrating the devices into their lessons.

During my observations, all of the students used the iPads for whole group instruction. In Billy's case, he did not stand out from the others because they worked on the same apps just at an individual pace. For example, the students worked on their iPads during handwriting time where they practiced writing letters and sentences. After completing each letter and sentence, the teacher checked the students for accuracy. Mrs. Credence explained that small groups were the best way to integrate technology into the classroom. I asked the question, "How are iPads best integrated into a classroom setting as a form of assistive technology, in your opinion?" She explained:

Small group. Because if you need to get on the Internet, it does not back things up and makes it difficult for the whole group to log on at the same time. Small group because the teacher can be supportive and with some assurance the kids are on task with where you want them to be.

The teachers used the iPads for small group and whole group based upon different activities. The teachers used the iPads for handwriting purposes, tracing apps, and for using the interactive whiteboard. Billy seemed motivated by the engaging and interactive aspects of these apps. Mrs. Credence explained that the apps she used with Billy kept him on task and kept his attention when she used them in small groups or individually. Mr. Pintak explained that the iPad helped to reinforce skills and provided extra practice for Billy. The device provided a way for him to tap into the visual video game world that he loved. "You are able to tap into that world, but you're not replacing a teacher or replacing the experience." Billy's IEP stated that he benefited from a visual model. The iPad provided those visual models and allowed for interactivity. The iPad apps that Billy

used for math had him manipulating place value blocks and using a ruler for measurement. This allowed him to interact with math tools in the process of building numbers and measuring items. These apps allowed for visual models of building numbers with place value blocks as well as providing visual representations of how to measure in different units. Billy's attention span was short during teacher talk or paper-pencil activities. During one observation, Billy worked on his handwriting and writing letters in cursive. The teachers and other students prompted Billy ten times to stay on task during the paper-pencil work, but when he used the iPad for the whiteboard app, he needed no prompts. Another time, the teachers redirected and prompted Billy six times during measurement review. The computer teacher also prompted Billy six times to continue logging onto his computer in computer class.

When Billy used the iPad, he focused on his work and required fewer prompts because he was interested in using the device. During the two observations where all students used the iPad for handwriting, Billy completed the task without taking a break or getting up out of his seat, thus needing no prompts to keep working. The only prompts given during this time were to create his letters with more accuracy. During one interaction, he expressed to the special education teacher that he came to school to focus. Billy responded well to working independently on iPad apps that included sequenced activities and prompts to help him move along on his own. The variety and fast-paced nature of many of the games allowed focused attention during these seven observations.

Billy required multiple interactions with a topic for him to understand that topic better. According to his IEP, "He [Billy] has picked up on concepts through repeated practice using various methods." The iPad provided a different means of instruction for

Billy. According to his IEP, Billy needed one-on-one instruction with the special education teacher to ensure extra practice on the new skills that he learned. I observed this type of instruction during my last observation. Mr. Pintak used the iPad as a way to reinforce the content taught during that day's math class. For example, during resource room, Mr. Pintak drew a connection between what Billy learned in class to what he needed for extra practice. Billy worked on this skill by playing an iPad game that had him manipulating math units for purposes of adding and subtracting different values. Mr. Pintak provided Billy with a different way of learning the math content through the usage of his iPad, thus individualizing instruction for him and allowing him the visual models that he needed.

Conclusion. Billy's story of iPad usage was not much different from the experiences of every student in his classroom because they all used iPads. The teachers provided iPads to the whole class, so they had the option of using the devices in any way that worked for them. This was an example of universal design where every student had access to the devices.

Universal Design for Learning (UDL) is an educational approach designed from the onset to meet the needs of a full range of students (Hitchcock & Stahl, 2003). Universal Design for Learning pushes the teachers to redefine technology usage in the classroom and integrate it in a meaningful manner (Meyer, Rose, & Gordon, 2014). Since the devices were universally available, the teachers integrated the devices throughout the school day to enhance the lessons. I saw the teachers use the handwriting apps and various math app games with the students. These apps let all the students practice content material and provided a motivational factor to learning. In conjunction

with the research of Coleman (2011), Billy's teachers also found that when their students used the iPads, their motivation increased as well as their effort. The teachers used the iPads to enhance the educational experiences of the students, rather than for specific assistive technology needs. No students in the classroom had a specific assistive technology need, not even Billy. The teachers used the devices on a daily basis because they knew that the iPads helped to focus student attention and that the students enjoyed using the devices.

Billy's usage of the iPad was much different from Mike's usage of the iPad. The iPad was a universal tool available to all students in Billy's classroom. Therefore, every student used the iPad to engage in games that enhanced the content that the teachers taught. Mike's iPad usage directly related to his needs as determined in his IEP.

Mike's iPad integration related to the SAMR substitution level where the teachers substituted the iPad for magnified materials. According to Mike's IEP, the teachers had the option of either providing Mike with magnified content material or access to magnified materials via an electronic device. As a result, Mike used the iPad to enlarge the content material, thus substituting enlarged papers for the iPad. In Billy's case, the integration of the iPads related to the augmentation level of the SAMR model (Puentedura, 2010). Puentedura (2010) defined augmentation as a direct tool substitute that provided functional improvement. In the case of Billy, the iPad enhanced the lesson and directly related to the content that the teachers taught. The teachers integrated the iPad because it helped Billy learn in a different way, but it was not any different from the instruction and access to technology that the other students received.

Theresa's iPad Fun

Theresa was a ten-year-old, fifth-grade student with a classification of autism, at the time of the observations. Theresa's home school district was the Littleton School District. During the academic school year, Theresa's IEP called for integrated co-teaching services in math, ELA, science, and social studies with pullout services for OT, PT, and speech and language. Theresa's IEP provided her with a teaching assistant for one-on-one support in attending to classroom activities. The IEP also listed that access to a computer was necessary for Theresa to use visuals as well as receive the curriculum at her independent level. According to her IEP, all of these services occurred in an integrated classroom setting.

Theresa's IEP stated that an iPad was a tool needed for her to access the general education curriculum. Mrs. Fairfield, Theresa's mother, provided a little background knowledge to why the iPad was the tool of choice. Mrs. Fairfield expressed to me that Theresa, "has always displayed an extra ability for technology and has used an iPad at home for play." She explained that the iPad helped her attend and provided her motivation. Through her usage and interests at home with the device, the school decided that they would try it out as a way to help her succeed within the classroom. Mrs. Fairfield explained that Theresa did not have strong writing abilities or verbal skills, but the iPad allowed her the interaction piece that she would not otherwise have. Not only did she use Proloquo2Go to help in communicating with peers and teachers, but she also learned how to use this application to build upon her vocabulary skills. Mrs. Fairfield told me that three years ago, she was nonverbal, but now she was able to talk and build upon her limited vocabulary. Finally, Mrs. Fairfield expressed to me that what she had

learned through this process was that using the device had to create meaning for the student. She stated, “If it is not meaningful to the individual, it’s pointless.”

During observations of Theresa, I noticed that Theresa used the iPad as a way to occupy her attention. Theresa’s IEP advised that she needed a piece of technology to access content at her level. The Assistive Technology Devices and/or Services section of the IEP stated that the school grant her access to a computer. The Service Delivery Recommendations stated, “Theresa requires access to a computer for visuals and to access the curriculum at her independent level.” Her IEP committee decided that an iPad would be the best device to use because Theresa was very familiar with it from usage at home. Theresa’s mom indicated that the iPad kept her attention and provided her with the motivation to keep learning. Below is an excerpt from the interview:

The school provided this (the iPad) for Theresa...It is one of the few things that has held her attention and has gotten her into reading, spelling, and math. It was a motivator of sorts. When we mentioned this to her teacher in the younger grades, they saw to getting her one themselves, and it has been a part of her curriculum since.

Her familiarity with the device prompted the committee members to use the device as a tool to help in reaching Theresa’s IEP goals. Theresa’s school activities did not relate to her goals, but instead, the teacher used the device as a way to keep her engaged and occupied with no expectations.

iPads are so fun. Access to the iPad allowed Theresa’s one-on-one aide to keep her occupied and engaged, and usage occurred consistently in a separate location outside of the general education classroom. Theresa’s aide, Mrs. Chancy, used the iPad with Theresa, when she felt that Theresa needed her attention focused for a period of time. During the observations, I did not see plans provided to Mrs. Chancy or see the special

education teacher provide her with any direction on how to use the iPad with Theresa. According to Theresa's IEP, iPad usage related to accessing the general education curriculum. Unfortunately, the games and activities that Theresa completed on the iPad were mostly unrelated to both her IEP goals and the grade level content. Her IEP goals revolved around reading a first-grade level passage and answering literal comprehension questions, improving written expression skills through handwriting and word processing, improving her receptive and expressive language skills, and printing three sentences from her own ideas. During all of my observations of iPad usage, Theresa worked on only one IEP related goal, which was improving her computation and money skills. The teachers used the device as a means to keep her busy while at school.

When the iPad usage involved instructional content, the content did not match what the other same grade-level students learned in the classroom or Theresa's IEP goals. For example, during one observation, Theresa watched a video on Henry Hudson and Christopher Columbus. At the same time, the other students learned about Veteran's Day. During another observation, Theresa played a measurement game and learned to measure objects, while the other students worked on the order of operations, with neither lesson associated with her goals nor the general education curriculum. Finally, during Theresa's scheduled math time, she remained in the resource room in a review group by herself. The math review group, located in the resource room with the special education teacher (which did not involve Theresa), focused instruction on the order of operations. Theresa worked with Mrs. Chancy on a subtraction app. Each example supported how Theresa's usage of the iPad never related to what the other students learned.

Wasting time. The iPad provided an avenue for her teachers to engage her with the content. During this time, Theresa used the iPad outside of the general education classroom. Theresa's day consisted of many pullout sessions with her special education teacher and her one-to-one aide. Pullout to the resource room often occurred when Theresa decided that she needed a break from her peers or from learning. During these times, Theresa got up from her desk in the classroom and left the room. Her one-on-one aide then followed her and prompted her to return to the classroom. When Theresa did not return to the classroom, the aide allowed her to continue her school day in the resource room. The special education teacher and teacher's assistant decided that leaving the room allowed Theresa a spot that was quiet and free from distractions where the iPad could keep her attention. Below is an excerpt of my notes during the fourth observation.

As I walked into the general education classroom, I noticed Theresa and her aide outside in the hallway taking a break. Her aide explained to me that she needed a break from the movie that they were watching because sometimes the lights and sounds throw her off. She then gave Theresa a choice of going back into the resource room to either play some games or to cut and color. Theresa continued to sway back and forth and then proceeded to follow her aide into the resource room.

Through my observations, I noticed that Theresa had an easier time focusing when in the resource room, perhaps due to the reduced noise level and the limited number of students. For example in observation four, Theresa and her aide were outside in the hallway taking a break from a movie because she felt Theresa needed a break from the lights and sounds. Unfortunately, the aide based this assumption on her knowledge of Theresa and not Theresa's own words. It was Theresa's decision if she removed herself from the classroom. During this observation, she stood up and walked out of the classroom where her one-to-one aide then redirected her to go into the resource room.

There was no effort on behalf of the aide to return her to the classroom. When in the resource room, the aide provided the iPad to Theresa and allowed her to go on any app so that she remained busy. Theresa seemed appeased by the resource room because she played on the iPad. When given a choice to use any app on the iPad, she used the drawing app. Unfortunately, she had no connection to the curriculum or the other students in the classroom because she never learned with those students.

In each of the observations, not much instructional time occurred because of Theresa's ability to remove herself from the classroom. The teachers did not confront Theresa when she chose to leave. During one interaction in the general education classroom, Mrs. Chancy told Theresa that science on the iPad was next. Theresa got upset and screamed, "laptop." Mrs. Chancy explained that the laptop would be later, but this did not appease Theresa. Mrs. Chancy then gave Theresa the laptop and instructed her to go to a specific program. Theresa again got upset and pushed Mrs. Chancy and shut the computer. As Mrs. Chancy reached for the iPad, Theresa got up and walked out of the classroom. Mrs. Chancy then persuaded Theresa to go into the resource room. She explained that if Theresa went on the iPad to watch a video, then she could draw, both unrelated to what occurred in the classroom. The teachers used the iPad as a way to keep Theresa occupied in a separate location during the times that her behavior flared. Mrs. Chancy expressed:

...when you are dealing with 20 something students, there is a wait time for things, and I find that some of the children we deal with it's nice to keep things moving...I can put her on BrainPop where it can support the lesson and give her the visual and keep her engaged, and when we go to the next thing, we can stop and still engage with the students that are around her.

Unfortunately, I did not see this occur because she used BrainPop in the resource room. Theresa never interacted with the same topics as the other students in the classroom and never received prompts to engage with the other students. It was unfortunate to see Theresa separated from her peers because her IEP stated that her peers accepted her behaviors. The IEP stated, “Many of her classmates are sensitive to her needs and will often offer emotional support when Theresa appears frustrated or sad.” In addition, the teachers did not try to engage her in the classroom so that she wanted to stay. Not only did her teachers separate her from her support system, but also they also denied her the opportunity to learn using a device that motivated and engaged her.

Conclusion. The manner in which Mrs. Chancy chose to have Theresa use the iPad did not involve her accessing content at her level as described in her IEP, but instead kept her busy and engaged through the integration of the device. During interviews with the teachers, it was clear that they believed in the motivational aspect of the device. To keep Theresa engaged in the learning process, Mrs. Mellet and Mrs. Chancy incorporated apps such as BrainPop that provided stimulation and incentive to continue working. There was no correlation between the apps and the content of the general education curriculum, and Mrs. Chancy integrated the iPad with no expectations for learning for Theresa. The only expectation was that Theresa remain engaged in playing the device. There was a disconnect between Theresa’s multidisciplinary team requirements of the device and how Theresa actually used the device. Theresa’s teachers integrated the iPad for “edutainment” purposes with no learning connections. Flewitt et al. (2015) defined edutainment as the combination of education and entertainment. Edutainment apps motivated students but did not provide options for individualizing content and instruction.

Theresa's usage related to the substitution level of the SAMR model. Theresa used her iPad to engage in activities and games instead of learning the content in the classroom. Using technology as a substitute involved the technology taking the place of a non-technological tool that ultimately provided no functional change (Puentedura, 2010). Theresa's iPad usage related to Mike's iPad usage because both teachers used the iPads as a tool substitute. Theresa's teachers used the iPad as a substitute for Theresa completing work through a different medium. Theresa used the device as another way to interact with the content. On the other hand, Billy's teachers went a step further using the iPad as a tool and creating functional improvement through the substitution of the tool. Regarding Theresa, if the teachers used the device more consistently with her, then there would have been more opportunities to build upon Theresa's communication, organization, and content knowledge.

No Help for Ben

Ben went to school in the Cedar School District and received instruction within an integrated classroom. Ben was a fourth-grade student who had limited verbal abilities, although he made some vocalizations through repetition of words and phrases. I had a limited picture of Ben's services and accommodations because the teacher did not allow me to review his IEP. Ben's teacher told me that he used the iPad for communication purposes. I learned that Ben mainly was in the classroom during morning meeting and then his aide removed him for the day. The teacher also shared that he spent less time in general education because they felt that he caused a disturbance to the other students in the classroom during instruction.

Ben had an iPad provided to him for communication purposes, but all of the students in his class also had iPads. The 2015-2016 school year was the first year that School Four started their “one iPad for every student” initiative. Storage carts in the classroom housed the iPads so that students could, in teacher-directed instructional periods, use the devices. Also, the students used the iPads during free time. Unfortunately, Ben did not have the same opportunities to use the iPad as the other students because his one-to-one aide controlled his iPad usage. Ben’s usage of the iPad was non-existent for communication during the two times that I observed in his classroom. Through communication with his teacher, I learned that Mrs. Tindle had many excuses for why she did not use the iPad in the classroom.

Excuses, excuses. In Ben’s classroom, there was a contradiction between what his teacher stated and what occurred in the classroom. Ben’s teacher explained that his team wanted him to use the iPad for communication, but she wanted less usage in the general education classroom to encourage more vocalizations. During the two times that I observed Ben in the classroom for morning meeting, he did not use his iPad to communicate and did not sit with the other students in the circle. Mrs. Tindle expressed to me that Ben liked to sit by himself. Mrs. Tindle consciously made an effort to remind the students that Ben was there and to include him in their morning meeting ritual. During the two observations that occurred, I did not see Ben use the device for communication in the classroom, but I did observe him vocalize to a student when prompted by his one-on-one aide. When it was time for student greetings, the teacher reminded the students not to forget about Ben and his one-to-one aide. She stated, “Remember, Ben can also say good morning, so go over there and wait for him to say

good morning.” During this interaction, the one-to-one aide prompted Ben to say, “Good Morning,” and then he repeated, “Good Morning.” This particular interaction was the only verbal communication I saw between Ben and the other students. Physically, there was a separation between Ben and the whole group during both morning meeting observations. Ben never sat with the students on the carpet but stood over by the counter with his one-to-one aide. The teacher did not refer questions to Ben, but only to the students on the carpet. His morning meeting time consisted of him standing and listening to the teacher and other students talk.

At the end of these interactions, Mrs. Tindle said to me, “...see how he doesn’t even want to sit with the group.” If the iPad usage occurred during morning meeting time, Ben would have had the capability of participating and learning along with his peers. I kept wondering, “Has he tried to sit with the group?” “What if the group compromised and did not sit but all stood like he did?” “What would happen if they used the iPad for communication?” These teachers would have answered the questions if my observations and interactions continued. Even though the school and teacher did not withdraw from the study, they stopped returning my attempts to contact them and further my experiences in the classroom. In my observations, Ben had access to an iPad for communication but the teachers did not give the option of using it to communicate with his peers or participate in the whole-group activities because of the excuses made by the teacher.

He is just a bother to the others. His teacher said that his behavior and vocalizations hindered him from participating in the classroom and created distractions for the other students. For Mrs. Tindle, Ben’s behavior determined whether he stayed in

the classroom and used the iPad. She explained that his behavior often consisted of him pacing and making loud noises. I did not see either of these behaviors occur during the observation times. She explained that there were times in the day when she could not have him in the classroom because of his disruptive noises and his need to pace around. As a result, she halted his access to the general education classroom and ultimately ended the instructional usage of the device. Mrs. Tindle explained:

Well with Ben, I would like to have Ben more but his behaviors really affect the other kids in the classroom and unfortunately there is a lot of pressure on us for good performance and you know Ben makes a lot of noises and he paces and you know there are certain times in the day that I can't have him in the classroom. I would like to have him all day, but he is also very physical and you know I can't. I do not think he is ever going to hurt any of the kids, but you never know.

During the observations, these behaviors did not occur, but the teacher still removed Ben from the classroom. Unfortunately, Mrs. Tindle believed that Ben's behaviors in the classroom directly affected his ability to use the iPad during classroom time. She also expressed to me that because of the pressure on the teachers for good performance, she had to ensure that her other students were learning and not distracted. Ben's behavior, vocalizations, and the need for movement interfered with her teaching abilities and the learning capacities for the other students, so it was best for the other students to have him not be in the room. Mrs. Tindle said, "It's unfortunate his situation because I think he likes being around the kids but doesn't know how to control some of his [behaviors]..." Mrs. Tindle shared that her intentions were to include Ben during content areas, but she also stated, "There was never a good time." I saw him use his iPad when the students completed morning work, and he had finished, so his aide allowed him to play a math iPad game.

After my second observation, I sent multiple follow-up email messages to set up my next observation. Mrs. Tindle told me that it would be more beneficial for me to observe Ben during one of his services. This email was the final communication I received from Mrs. Tindle. I sent four more emails to Mrs. Tindle about the times that I could observe speech and I received no response back. I knew that I would not be able to finish observing Ben because the speech teacher did not respond to my emails and was the teacher that told me at the beginning of the study that she was too busy to participate. As a result, I no longer observed in the classroom.

Conclusion. Ben's iPad usage was non-existent because his teacher never provided a time for him to use the iPad. Ben's teacher did not take the time to integrate the device into the content because he rarely stayed in the room for content-area instruction. According to Mrs. Tindle, device usage should have occurred for communication purposes but device usage depended upon classroom conditions and Ben's behavior. Mrs. Tindle knew that Ben needed the device to assist in heightening his communication abilities, but she made excuses not to use the device.

Ben's device usage or examples of non-usage did not directly relate to the stories of the three other participants. If Ben's teachers used the device to heighten and support Ben's communication, then the iPad could have provided a transformational value to Ben's educational experience. According to the SAMR model, if the teachers used the iPad for communication purposes, it would have fit under the modification level. Puentedura (2010) described the modification level as a level where teachers redesign tasks with technology. Unfortunately, Ben's story showed how technology could have

had a strong value on education and communication, but because the teacher did not integrate the iPad, Ben's educational experiences suffered.

The general education teacher wanted Ben to express himself vocally even though that was not his preferred method of communication. Ben's teacher did not understand his abilities through a social construction view of disability. Rather than shifting the focus of his inabilities to the environment, they focused on him not communicating verbally like everyone else. A social construction view of disability calls for educators to make modifications to ensure that individuals with disabilities have equal access to the educational environment (Higbee & Goff, 2008). Preferring one mode of communication over another, verbalizations over communication devices, aligns itself with the concept of ableism.

Rauscher and McClintock (1997) explain ableism as, "pervasive system of discrimination and exclusion that oppresses people [with]...disabilities on...individual, institutional, and societal/cultural levels (p. 198). Keith Storey (2007) connected ableism to schools to describe the reasons why students with disabilities are not included. Mrs. Tindle struggled with including Ben in her classroom because he could not do things the same way that the other students could. Mrs. Tindle expressed during the interview that the iPad provided a means to communicate with students who did not have a voice, like Ben, but then went on to say in an email that she did not want Ben to use the iPad in the classroom for communication. Ben's non-usage of the iPad stifled his voice. It was more important to his teachers that he vocalized through his voice in the classroom rather than use his device for communication.

Conclusion

The stories of the four different students varied tremendously. Each student accessed the same type of device, but the teachers integrated the devices in various ways. The SAMR model of technology integration helped to frame the students' stories in order to understand the iPad integration.

Mike's iPad usage mainly occurred within the math classroom. There was also sporadic usage of the device in different settings and with different teachers. He used his iPad to access any content material visually that the teachers projected onto the board. Mike's usage related to the substitution level of the SAMR model. In Billy's story, his teachers integrated iPads into the classroom for every student. Billy's story of usage fit with the augmentation level of the SAMR model. Theresa's iPad usage only occurred within the resource room. Her one-to-one aide used the iPad to engage her in activities, motivate her to keep working, and to keep her busy. Theresa's one-to-one aide used the iPad as a substitute for written work, thus fitting under the substitution level of the SAMR model. Despite the fact that he had access to a device to support his communication, Ben never used it. In the classroom, his teacher did not integrate the iPad because her focus was more on the other students and their learning. There was no connection to the SAMR model because he did not use the iPad.

Each student used the iPad in different ways and for different purposes. iPad usage ranged from non-usage to enhancing the curriculum with the device. In all cases, if the teachers changed the way that they integrated the iPads, students could see increased academic, communicative, and/or social outcomes. When meaningful integration of an iPad has the chance to occur, teachers have the chance to enhance the educational opportunities of each student.

CHAPTER FIVE: ACTIONS SPEAK LOUDER THAN WORDS

Beliefs and Practices

The teachers in each of the four classrooms used the iPads with the students in different ways. I looked at the four different participants and their stories and determined that there were cross-case themes. I found that teachers' planning and execution of iPad usage did not coincide with their stated beliefs about the best uses of iPads with students with disabilities. Through interviews, I talked with the teachers about their beliefs about their students and their usage of iPads. Then, through observations, I saw how these beliefs played out in the implementation of the devices. The inconsistency between teacher beliefs and pedagogy led to my construction of this chapter's themes. Mike and Billy's teachers felt that the iPads provided an avenue for differentiated learning and opportunities for full participation. Mike's teachers used the iPad in the classroom on a daily basis, but this usage did not extend to other settings. Billy's teachers also used the iPad on a consistent basis, but his usage mimicked the usage of his peers. Theresa and Ben's teachers believed in using technology, but then they rarely used the iPads for their intended purposes. Theresa needed the iPad for communication and she used it for playing games. Ben also needed the iPad for communication, but then did not have the opportunity to use it in the classroom.

I focus this chapter on how the idea of competence plays out across teacher-stated beliefs, and their actions with students who have low incidence disabilities. Presuming competence relates to the field of students with disabilities along with the construction of educational approaches available to these students (Biklen, 1990; Blatt, 1999; Goode, 1992; Kliever, 1998). I viewed the approaches discussed in this chapter through this

construct. I organized this chapter into two sections: teacher beliefs and teacher practices. I found that sometimes there was alignment between beliefs and practices and sometimes there was misalignment.

Teacher Stated Beliefs

The teacher stated beliefs evolved through the interviews conducted with each teacher. The teachers expressed that they had strong beliefs that their students could achieve in the classroom and that through the addition of a technology device, the achievement increased. The teachers expressed how iPads helped students with disabilities in their classroom access the curriculum. In the eight preliminary interviews I conducted with school personnel, each expressed a strong belief that their students could achieve in the classroom. There were three main points brought up in the interviews about how iPads helped students with disabilities access the curriculum and heighten membership: competence, individualized learning/differentiation, and repetition and reinforcement.

Pedagogy of competence. Presuming competence in the classroom involves finding different ways that students build upon and demonstrate their knowledge once teachers first presume that students can contribute (Biklen & Burke, 2006). The teachers expressed that they believed in what the students could do, but this was not always evident in the classroom. Mike's teacher, Mrs. Mallard coordinated his services and sat on his IEP committee. Through her interview, I noticed that she was a teacher who presumed competence. In my interview with Mrs. Mallard, she stated that she had always been a very compassionate person and liked looking out for the underdog. Her focus in the classroom was about wanting the students to achieve and go beyond their

capabilities. She expressed her presumption of competence for students in one of her answers to my interview questions stating:

I think that just wanting kids to achieve not just, what they are capable of but going beyond. That has always been a push for me. Not just the basics but push them beyond and to always have expectations for them that are higher than I think society for special education I think sometimes society expects of them.

I did not observe Mrs. Mallard working directly with Mike, so I did not see evidence of her presumption of competence.

Mrs. Chancy also expressed about the presumption of competence regarding Theresa. In an observation of Theresa, Mrs. Chancy, Theresa's one-to-one aide described how working with Theresa opened her eyes to what Theresa could do. During a side conversation, Mrs. Chancy explained that when she met Theresa, she did not think she could accomplish educational tasks. Mrs. Chancy explained that she did not know what Theresa was capable of until she provided her opportunities to show her knowledge. Her explanation of competence proved to be a positive one, but I did not see Mrs. Chancy push Theresa to engage in educational content at her level. Mrs. Chancy provided Theresa with opportunities to play games on the iPad instead of learning the curriculum. These examples demonstrated a disconnect between Mrs. Chancy's stated belief and her educational practice.

I had a similar interaction with Ben's teacher. During the interviews, Mrs. Tindle explained that she was supportive of using the iPad as a communication device because she saw the benefits of using it with another student.

...last year I had a child that spoke through the iPad, and she used her eyes...that was my first experience with using it and she was phenomenal with it...it was funny to see how much she was getting you know because she couldn't speak to me. But like we would be doing an activity, and she would be like isn't it snack time?...She was communicating at random, but she knew what was going on.

The quote explained Mrs. Tindle's openness to using technology in the classroom because she described how the technology helped a former student communicate and interact within the classroom environment. However, during the observations of Ben, I never saw her prompting Ben to use the iPad to communicate, so this halted Ben's participation in classroom conversations. In this case, there was a disconnect between the beliefs and pedagogy with which the teachers aligned themselves and what I saw in the classroom.

People often make presumptions about students depending upon their level and disability classification. These students with IEPs had classifications that placed them into a disability category. Often in special education, students have a harder time expressing their knowledge; therefore, teachers need to provide experiences for these students, so that they can gain new knowledge and demonstrate it in a way that works for them. Teacher actions and responses to my interview questions related to their thoughts on the presumption of competence. During the interviews, I asked teachers about the ways that students accessed the curriculum. Mr. Pine explained that he increased access to the curriculum through the integration of technology. The iPads allowed the teachers to have the students interacting with the content while the teachers acted in support roles:

...technology opened up that door for differentiating instruction for 25 kids in the classroom at the same time...two teachers were in the room and we would cycle around and go to the kids that needed the most support whereas kids that didn't need it, they could just work on their own.

Using the iPads in this manner allowed student access to the content in different ways.

Mrs. Perry also explained that having access to electronic resources helped with repetition and reinforcement of the curriculum. She expressed, "...most resources are

now electronically available...if you can't hear something or you can't see it or you just miss all the action, you can replay it and focus on different parts.” Mr. Pintak explained the importance of accessing materials quickly, “...you are able to use it as a quick tool in front of you to explain your thoughts to the teacher.” Through the interviews, I gained information from each of the participants about their beliefs in student abilities concerning iPad usage, but based upon my observations, teacher actions often masked teacher beliefs about the presumption of competence.

The usage of iPads with the students of interest helped them show their knowledge and understanding. The iPads, when connected to content and communication, provided different ways to engage in the classroom, and the teachers believed that these devices provided their students with benefits. In the interviews, the teachers expressed their feelings about device usage and how this type of technology supported students with low incidence disabilities in inclusive settings. Specifically, the teachers responded about how assistive technology provided benefits.

Mrs. Credence: I think what it allows them is a pacing alternative...It gives them practice and exposure.

Mrs. Tindle: ...it is the voice for many of them. Now they can communicate.

Mrs. Chancy: ...it gives them more visuals.

Mrs. Mellet:...I think it can help them with communication.

Mr. Pintak: ...having a tool to quickly get your thoughts out has been fantastic to really get kids to realize that they do have a voice and they can have a reciprocal conversation back and forth even if that is one picture, one word.

Mr. Pine: ...I really loved it because it differentiated instruction for everyone at the same time. And so kids that had disabilities in math or needed extra practice, they could work at their own pace and students who excelled and needed more challenges could move on and go onto the challenge problems.

Overall, the teachers believed that iPads provided multiple benefits for students that included hands-on learning, incentives, motivation, engagement, independence, reinforcement, and lesson support. Mrs. Credence's explanation of pacing and practice

connected to using the iPad to complete tasks without pressure because the tasks could be broken down. She also explained that the pacing alternative allowed students to focus on answering questions correctly before moving on. Mrs. Tindle found that iPads allowed students who could not communicate, or had communicative needs, a way to communicate through different apps on the iPad. She explained that this was important for Ben because the goal for the year was to help him build his communication skills with the iPad. Mrs. Mellet also agreed that iPads allowed for additional communicative support. Mr. Pintak explained that when he used the iPad for communication purposes, he found other issues ceased. He explained that many social and behavioral issues arose from not being able to communicate. When given the ability to communicate through a different avenue, the students realized that they had a tool that could quickly get their thoughts out to the rest of the class. Mrs. Chancy used the iPad as a way to provide a visual support for Theresa during lecture periods. As a result, the visual also helped to keep her engaged. Finally, Mr. Pine explained that using iPads helped to adjust the learning to fit each student in his classroom. Thus, differentiation became easier.

The above quotes and context provided insight into the teachers' beliefs that technology helped students with disabilities. The question revolved around if teachers believed that these devices helped, then why did the teachers not use these devices in those ways during classroom instruction? Mrs. Tindle and Mrs. Mellet expressed that the iPad provided a means for communication for their students. I did not see either teacher use the iPad with their students in a communicative form in order for their students to participate in the classroom or with their peers. Mr. Pine explained that the iPad provided differentiation techniques for all students. Mr. Pine incorporated the iPad with

his one student that needed it but not with any other students and did not use it as a differentiation technique. It came down to the teachers exhibiting their presumption of competence in the classroom for these students. There appeared to be a disconnect between beliefs and practices. The teachers in this study focused on individualized learning/differentiation and repetition/reinforcement as key strategies to increase student participation and knowledge.

iPads and individualized learning/differentiation. As Mr. Pine explained in his interview, iPads provided students with disabilities not only exposure to the uses of technology, which every twenty-first-century learner needed to have but also differentiated learning opportunities. Differentiation allows teachers to tailor instruction to meet the diverse learning needs of their students. When teachers differentiate instruction, they can alter the content, process, product, or learning environment. This type of instructional approach enhances individualized learning opportunities. One way that the teachers differentiated for Mike was by using the iPad to meet his visual needs. He explained how the iPad helped him to access the content visually. “There is something called join.me-it helps me join someone and um for math any class really. You just punch in a code, and it will be there in seconds.” Billy’s teachers incorporated the iPad to provide a different way for him to learn the content. The usage of the app and the iPad helped them to succeed in school and access classroom information.

Teachers incorporated iPads to help students with pacing, and the devices provided extra time and extra practice all in a device that did not set that student apart from the rest of the class. The teacher used iPads regularly, so students required little preparation for usage and there appeared to be fewer stigmas attached to using the device

when all students had the opportunity to use them. iPads provided students opportunities to learn the content in different ways. Mrs. Credence explained that different applications allowed the students to use their different learning modalities and styles by providing visuals, use of bodily movements through interactive activities, and instant gratification through sights and sounds. Coleman (2011) also found that praise and gratification awarded to students through the iPad helped to keep them engaged, motivated, and focused on the task. iPads also provided a convenient way to access information quickly and easily. The teachers scaffolded the content based on the student's needs and presented it in an easy manner. Just as Mr. Pintak expressed, iPads provided students with disabilities predictability and a way for these students to become independent self-learners who self-monitor. I asked Mr. Pintak how his teaching and the usage of technology helped Billy. He explained:

My main goals with Billy in the general education classroom are to assist him in initiating tasks, following through with tasks, completing tasks, and paying attention to the verbal words said. A multitude of prompts are used (visual, gestures, verbal, positional, and locational). The prompts vary by day and task; as of late, I am trying to step back and give prompts from a distance; so that, he is not so dependent on adults. The iPad, during reinforcement/practice, is helpful so that an adult can step back and allow more independence. From my experience, technology improves focus and stamina. Billy has benefitted from the iPad for those two reasons.

These supports, when combined, helped to provide access to the curriculum for students with disabilities.

During the interviews, the teachers also made statements about working toward curricular accessibility within the classroom.

Mrs. Mellet: I taught K-6 and when you get to 5th and 6th, it is a lot more lecture. I think that [iPad] allows for the information to be presented in a way that they can understand, whether it is a movie or a visual.

Mr. Pine: ...we would make videos of lessons that were pre-taught or post-taught and post online...the students can type the link in and watch the videos at home.

Mrs. Perry: It allows kids more access to direct connection to their teacher. I have kids who personally message me on Edmodo.

Mrs. Mallard: Well they [iPads] definitely make it more user friendly. When you have pieces of paper this big and books this big and homework papers this big, it is you know not as accessible for sure.

These four teachers each explained that the iPad provided an easier way for their students to access content by providing them with multiple avenues to understand the information presented. Mrs. Mellet explained that in the upper elementary grades, iPads allowed students to access movies or visuals that supported the curriculum. The iPad allowed for the presentation of information in a way that students understood it, and access occurred quickly. Mr. Pine also explained that he used iPads to present the content in different ways. He used them to create videos of the lessons for pre-teaching, as well as used the devices for flipped classrooms (the reversal of lecture and homework models in a classroom). Mrs. Perry also used the iPad in her classroom in this manner. When she used the iPad to aid in flipping her classroom, she felt that the iPad helped to create a stronger connection between her and the students because the technology provided 24-hour access. Finally, Mrs. Mallard expressed that the iPad provided instant accessibility because the teachers took steps to include all curricula information onto the iPad. Each of the teachers explained that they used the iPads in strategic ways to include the students in the learning environment, but this was not always evident in their actions. To accomplish the integration of the iPads to match student needs, the teachers needed to know the students and then individualize the curriculum to each ones' needs. Once accomplished, the integration of iPads occurred allowing teachers to meet individual student needs.

The teachers believed that individualized learning and differentiation helped students with disabilities access the curriculum. Individualized learning included tailoring instruction to meet the needs of the students. Mrs. Mallard explained that with iPads, students learned, but there was a learning curve. She explained that the iPad brought challenges with learning because the students had to learn how to use it appropriately. Mike, one of Mrs. Mallard's students, worked on his knowledge of how to use the tool to help him access the curriculum. She explained, "This little guy is not there yet, but we've kind of thrown a lot at him right now. So like I said...we're not necessarily there just yet but I'd rather he get confident with what [the iPad] he has." Through this statement, she expressed that Mike did have the ability to learn and demonstrate his learning, but he still worked on building upon his learning tools to use the iPad to aid him in the learning process. Mrs. Mellet also built upon this idea that technology made learning quicker and easier for students with disabilities. Instead of allowing them to struggle through the content, the iPads allowed them to access the information at their level. She explained that it allowed for the presentation of information in a way that students understood. "It just makes it easier to access the curriculum...the information to be presented in a way that they can understand it." Unfortunately, Mike did not consistently use the iPad in every classroom setting.

Three of the teachers, Mr. Pine, Mrs. Credence, and Mrs. Perry also mentioned the importance of meeting the various needs of their students. Mrs. Perry explained that she had to meet Mike's needs when she first introduced the iPad to him because he had trouble learning how to use it appropriately in the classroom. Without having the option to take the iPad home, Mrs. Perry provided training to him at school so that he felt more

comfortable using the device. She also explained that the iPad allowed her to provide him a way to access his textbook in a bigger font. "...the nice thing about the iPad for the visually impaired kids is ...they got our textbook ...on there, so it is not these big cumbersome sheets...now kids are getting good at enlarging on the iPads and scrolling up and down." Mr. Pine, who worked with Mrs. Perry, further explained that they also differentiated instruction by providing instruction via a flipped classroom. Mr. Pine explained how he incorporated a flipped classroom via the iPads:

I would use the service called Ensemble and you can upload your videos and it provides you a link to the Internet where the students can type the link in and watch the video at home. We have done both where they watch at home and watch in class and work at an independent level like a flipped classroom.

Finally, Mrs. Credence expressed that iPads provided alternatives. "I think in some cases it can provide a modification or number of practices or different types of practices." The teachers believed that iPads provided a means for tailoring instruction to meet the needs of their students. The iPads allowed the teachers the opportunity to individualize instruction so that teachers met individual student needs. Mike said, "It just helps me get everything done. It does a lot of stuff." Mrs. Perry and Mr. Pine tried to provide Mike with multiple opportunities to use his iPad to help him instructionally. Unfortunately, as described later in this chapter, even though the teachers believed that the iPads helped students academically, they did not use them in this manner.

iPads and repetition/reinforcement. The teacher interviews also elicited stances on the importance of providing students with disabilities ways to practice and repeat information as well as avenues for sparking their interest and increasing their motivation. The teachers explained how iPads assisted students with disabilities in learning because they provided repetition and reinforcement. Mrs. Chancy explained that iPads helped to

spark interest and keep students' attention so that the students built upon their skills. As a result, repeating the skills helped them expand their knowledge. She explained that her student, Theresa, considered using the iPad as fun, which helped to engage her. Mrs. Tindle explained further that when she connected learning activities to student interests with the iPad, student learning heightened and they became captivated by the topics. For example, I saw her use the iPads during morning work time where the students blogged about the question or comment of the day. Unfortunately, she did not include Ben in this activity. She also explained how she liked to use the iPad with Ben, "You know Ben loves music, so anything music related that goes along with the topic is great for him." I never saw Mrs. Tindle use the iPad with Ben in this manner. Mr. Pintak also agreed with the idea of reinforcing skills and making learning appealing.

In the follow-up email interviews that I conducted with five of the teachers, I asked them specifically about how iPads assisted students during the learning process. The teachers explained that iPads helped to meet individual student needs, engaged a diversity of learning styles, built independence, and increased motivation and interactions.

Mr. Pine: My teaching strategies are balanced so that I engage a diversity of learning styles and meet various needs of the students.

Mrs. Mellet: She is highly motivated by activities on the computer or iPad. In addition, it allows for the student to have material presented visually.

Mr. Pine explained that he liked to integrate the iPad into classroom instruction because it provided another way to meet the needs of his students. He further explained the connection between the iPad and meeting the needs of his student during his interview. He explained that iPads provided options for students to learn in different ways. Mr. Pintak agreed and stated that the iPad provided practice for Billy because it interested

him and it promoted independence. In his interview, he explained that he used the different iPad apps to teach the various areas of the curricula: tracing apps for handwriting, interactive whiteboards to portray content, math fluency, word processing, and word prediction. Finally, Mrs. Mellet reiterated the idea that the iPad was a motivational tool. She found that the iPad motivated Theresa because of the tactile interactions.

Many of the apps related to content and provided a form of remedial help or supplemental learning. The teachers believed that although this game playing was content-based, it occurred during recess or free time causing the students to see this type of iPad usage as a break from the normal learning routine. Both Mike and Billy alluded to iPads and game playing. During Mike's interview, he showed me different apps on his iPad. One app popped up, and he said, "This is a game for me." He later explained, "I sometimes use it-it's not really educational-it's just a game." When interviewing Billy, he explained that he liked playing the truck game. He said, "I like truck games." He referred to the app as a game, when it actually had educational content connected to it. The truck game was an adding game. The students appreciated the motivational praise given during times that a student mastered the activity.

Technology provided an opportunity for students to learn and demonstrate their knowledge in their way. For technology to support students in the learning process, teachers needed to believe that students could learn. Through the interviews with the teachers, I could tell that the teachers believed in using the iPads for reinforcing content and sparking interest, but this did not always happen during their act of teaching.

Teacher Practices

Some of the teachers, in this study, struggled with including students in the classroom because the teachers had the idea that some students could not do things the same way as all other students. Teacher assumptions about students led to a disconnect between teacher beliefs and practices, which some call ableism. Multiple authors have connected the definition of ableism to the classroom environment, often focusing on the prejudicial views of schools and teachers on students with disabilities (Hehir, 2002; Rauscher & McClintock, 1997; Storey, 2007). These views often revolve around the idea that there are preferable ways of living within our world (Ashby, 2010; Hehir, 2002; Storey, 2007) and those ways reflect nondisabled ways of being. To combat ableism, one needs to focus on the environment as causing persons to be disabled rather than on the individual (Higbee & Goff, 2008). When one breaks down their ableist perspective, then there are more opportunities for inclusion (Hehir, 2002).

From the initial interviews with Mrs. Chancy and Mrs. Tindle, I decided to watch their interactions with the students because certain parts of the interviews led me to believe that they had assumptions about their students. During Mrs. Chancy's interview, I asked about academic support on the iPad versus communicative support. She explained about the integration of iPads:

I think it depends on the student in general because some students have more skills in the communication side so they may not need as much but many of these students do need the schedule, so I find that some of it depends on the student. And how verbal they are and how much of an understanding they have.

Mrs. Chancy further explained that she mainly used the iPad for scheduling because communication was not yet there. From this interaction with Mrs. Chancy, I saw that she focused more on scheduling and not on educational or communicative opportunities when these were the opportunities specified as the need in the IEP. In addition,

according to Mrs. Chancy's own words, she presumed Theresa's competence but did not allow her to communicate her thoughts.

Mrs. Tindle made similar assumptions about Ben in her interview. Mrs. Tindle expressed during the interview that the iPad provided a means to communicate with students who did not have a voice, like Ben, but then went on to say in an email that "they" do not want Ben to use the iPad in the classroom for communication. Why is there this disconnect? The common thread was that both Theresa and Ben had limited verbal skills and both did not use the iPad for communicative purposes. Keith Storey (2007) explained that ableism related to a lack of understanding about disability issues. I saw this in these two classrooms. Mrs. Chancy explained that using an iPad with a specific program first depends on the student, "...how verbal they are and how much of an understanding they have." This quote proves that Mrs. Chancy connected a student's understanding to if they could verbalize their understanding or not. I think that Mrs. Chancy and Mrs. Tindle did not get to know their students' capabilities. They both celebrated speech over using the iPad as a means of communication. I questioned whether this was a point to make for ableism or if it was a call for the creation of stronger connections.

The non-usage of the iPad often occurred by the teachers in the classrooms because of efficiency and difference. Storey (2007) and Hehir (2002) explained efficiency as the best way to do something, for example, to roll versus walk. Storey (2007) explained difference as being open to the multiple ways of learning and obtaining information. I questioned efficiency and difference regarding Theresa and Ben. In Theresa's case, the teachers allowed her to remove herself from the classroom and then

proceeded to provide activities within the resource room setting. I never witnessed the special education teacher tell Mrs. Chancy to take Theresa back to the classroom. When the teachers provided activities, the activities were apps not directly related to what the other students learned. For example, Mrs. Chancy allowed Theresa to play on the drawing app, watch videos, and play with music apps. Instruction became more busy work than related to content. Theresa's one-to-one aide strategically planned her day so that she had no down time. A typical thirty-minute class period included a transition (walking the halls), her schedule presented visually, work on the iPad (either a game reinforcing a topic or a movie), a break including time to move or arm walks, free time, and then she finished up talking about a topic. Theresa's day included chunks of instruction so that the teachers did not overwhelm or frustrate her. The teachers built in breaks and instructional variety so that Theresa did not sit and learn for long periods. The teachers used the iPad for organizing her day rather than for meeting her educational needs at her level. The teachers kept her occupied through this device. Theresa's aide knew that the iPad was an efficient tool because it allowed Theresa to engage throughout the day. Mrs. Chancy explained, "I do believe that they make so many of these programs fun, so I think the child doesn't realize how much work they are doing which helps to engage them further." She also explained that for Theresa, they needed to keep things moving, so there was no wait time. The usage of the iPad ultimately reflected how to keep Theresa occupied rather than used in a way to support her communication and academic needs. Again, is this a form of ableism or just poor planning and integration?

Ben's story was very similar in that the teachers associated with Ben's education made the decisions about his iPad usage. His story reflected true ableism. In one of the

last interactions I had with Ben's teacher, she explained to me that they tried not to use the iPad for communication in the classroom because they wanted him to vocalize more.

In her final email, she wrote:

I think a better time to observe Ben may be in speech to see him use his iPad. We are encouraging him to use his voice as much as possible in morning meeting time. Speech is a great time to see the iPad being used.

This quote reflects the ableist mentality that Mrs. Tindle had about Ben and his communication abilities. She emphasized vocalizations and verbal speech in her classroom over using a communication device, therefore Ben rarely used his device. This is a problem because Mrs. Tindle is expressing that the "normal" way of speaking is the "right" way to communicate, thus feeding into the ableist mentality.

I saw no attempt made at including Ben in the morning meeting so that he had the opportunity to communicate with his peers. During both observations, Ben stood to the side of the group and did not engage in the questions and discussions. The teacher did not call upon him nor did he participate on his own. During this time, he did not have his iPad available for communicating. The teacher also blocked many of the opportunities for Ben to learn with his peers because she was afraid that Ben would cause a distraction to the other students who were in the classroom. During the interview, she explained that these behaviors and distractions played a role in his iPad integration. Mrs. Tindle provided the following explanation about why she did not integrate the iPad:

I would like to have Ben more [in the classroom] but his behaviors you know really affect the other kids in the classroom, and unfortunately, there is a lot of pressure on us for good performance. You know Ben makes a lot of noises, and he paces, and you know there are certain times in the day that I cannot have him in the classroom, and I would like to have him all day but he is also very physical, and you know I cannot. I do not think he is ever going to hurt any of the kids, but you never know. When he gets in a mood, like you know it is just unsafe. It is unfortunate his situation because I think he likes being around the kids...

His teacher recommended removing him from the classroom so that his learning could take place in a separate location in order for all the other students to have the opportunity for uninterrupted learning.

In both of these cases, the teaching assistants guided the usage of the iPads. The teachers did not provide students with the option on when or where to use the iPads or even on whether or not their iPad usage connected to learning instructional content. When teachers controlled iPad usage, there was little opportunity left for the students to choose how and when usage occurred. The teacher's choice of usage related to assumptions about what the students could do.

The teachers talked about presuming competence in their students, but there was misalignment between the practices that occurred in the classroom and their beliefs. These practices revolved around the teachers' low expectations for the students. Mrs. Chancy explained that when she first met Theresa, she did not know her capabilities. She explained that Theresa needed a lot of practice at completing activities but in the end, she did well with them. The stance that Mrs. Chancy took showed that she had low expectations for Theresa. She explained it in a way that showed that she had to push Theresa to demonstrate her knowledge. Furthermore, without the thoughtful activities provided to her, no one knew her capabilities. Instead of providing their students with the tools to succeed, for example, an iPad, to let the students show them what they could do, the activities planned by the teachers depended on what they thought their students could or could not do.

The non-usage of an iPad played a vital role in whether a student participated in general education. When the teachers used the iPad for communication purposes, this

allowed the students to have the option for communication. The only time that I saw an iPad used for communicative purposes was with Theresa and Mrs. Chancy. During observation two, Theresa watched a BrainPop video. After the video, Mrs. Chancy said to Theresa, “I know I promised you some free time.” She then proceeded to give Theresa a piece of paper and crayons so that she could draw. As Theresa drew, Mrs. Chancy asked her about her drawing. Mrs. Chancy proceeded to open up the app Proloquo2Go and asked Theresa what the bee was doing. She asked her to type her response. Theresa typed *bzzzzzzzzz* and then *ahhhhhh*. Mrs. Chancy laughed, and they moved on. Mrs. Chancy did not follow through with this communicative interaction but instead halted the interaction after it occurred.

In the instances of Theresa and Ben, their non-usage of the iPad stifled their voice. The iPads allowed them to communicate with the people around them, but the teachers did not integrate the iPads in this manner. The teachers provided no communication programs related to educational content for the students in their one-to-one settings.

The data from the observations for some of the teachers negated the belief that their students learned just like all the other students in the classroom. For example, Theresa and Ben’s teachers felt that they could not always learn in the general education classroom because of the distractions and noises that they caused or others caused for them. Theresa’s one-to-one aide expressed that in the integrated classroom there was a lot going on, and it was nice to be able to have an additional space that was quiet and calm. “And to keep them calm, it’s a much better environment for them to learn and engage.” Ben’s teacher, Mrs. Tindle also explained in the interview that his behaviors

affected the other students' abilities to learn. As a result, Theresa and Ben's membership in the classroom halted because of their separation from the general education classroom environment. The opportunities to learn with their peers did not occur.

Pedagogy of participation. For students to succeed in the learning process, they must feel a sense of belonging (Beck & Malley, 1998) and receive opportunities to participate. Skinner, Furrer, Marchund, and Kindermann (2008) found that when teachers emotionally engaged their students in the classroom, behavioral engagement increased, thus also increasing participation. Their findings concluded that teacher support played a major role in the motivational dynamics of engagement (Skinner et al., 2008). In their research, Skinner and colleagues (2008) determined that, "...children with low classroom participation will eventually lose their enjoyment of learning activities and become more bored, anxious, and frustrated as the year progresses (p. 777). In order to increase participation, the teacher's role must focus upon increasing engagement (Skinner et al., 2008).

As stated above, the actions of the teachers played a vital role in ensuring that their students became members of the classroom community. As mentioned in the previous sections, teacher beliefs did not always align with their actions about student competency and teaching strategies. As a result, student belonging and participation suffered.

Teacher beliefs and participation. Out of the four students, I observed two of the students who had more opportunities to participate in the classroom because they could interact with their peers. Mike and Billy's stories differed from Theresa and Ben's stories because Mike and Billy had full participation within the general education

classroom. Mike and Billy both used the iPads for purposes of extending and building upon their educational needs. Mike independently used the iPad to access the general education curriculum visually, and Billy independently used the iPad to build upon the skills and content that he learned in the classroom. Mike and Billy's participation in the classroom reflected the actions of their teachers. Their teachers purposefully planned for the usage of the iPads to take into account the needs of each of the students. In the follow-up emails, Mike and Billy's teachers wrote about planning:

Mrs. Perry: His iPad has our book on it, so anytime we use it, he can get it on the iPad and enlarge it to any size he needs... We use a join.me app so that he sees everything I do on the Promethean board.

Mrs. Credence: When I assign specific use of apps like cursive, white board, number pieces for math, I think it allows him to interact and respond while not being limited by his handwriting... Although I feel I have made progress with [the] use of technology in my room, I know there is more available.

Thus, iPad usage occurred in the general education classroom and among peers. This usage heightened Mike and Billy's participation because they took part in activities and peer interactions. The teachers' actions supported the idea of competency in the classroom.

On the other hand, differing teacher beliefs related to the hindrance of two students' participation. Theresa and Ben's iPad usage usually happened in seclusion. Theresa often used her iPad in the resource room because her aide believed that she needed a quieter space. Ben used his iPad in the speech room because that was where he worked on communication. Ben's teacher, Mrs. Tindle expressed in her interview that Ben was not included in all parts of the fourth-grade day because of his behaviors. She expressed that his behaviors affected the other students' learning, so she encouraged his one-to-one aide to remove him from the classroom when he made noises, his behavior

flared, or he became physical. The times I observed Ben included in classroom conversations were during morning meeting and even then, he separated himself from his peers, both times standing over by the wall next to the counter and not able to use his iPad.

My observations of Theresa were very similar to Ben in that her behaviors and vocalizations often led to her removal from the general education classroom. Theresa removed herself from the classroom, and Mrs. Chancy followed her throughout the hallways never coercing her back into the general education classroom, but always back into the resource room. In observations 1, 2, 4, and 5, Theresa started out her class time in the general education classroom but then removed herself from the classroom by getting up and walking out. Mrs. Chancy read this as a sign that Theresa needed a break. The two of them then proceeded to the special education classroom where she used her iPad to play games. The two other times I observed, Theresa started in the special education classroom because the teachers had already formed specific groups. The special education teacher placed Theresa in a group by herself to work with her one-to-one aide, thus further creating a separation among students. This physical separation from the other students naturally occurred because it was what always happened. Theresa always worked independently with her one-to-one aide.

When the students used the iPads in the classroom with their peers like Mike and Billy, their participation heightened. With Theresa and Ben, the teachers excluded them from their peers and had them use their iPads in separate locations, so participation halted. The teachers' planning for this type of instructional delivery showed their contradictory beliefs about presuming their student's competency. As described above,

both teachers explained that their students were unable to work with others because they caused the distractions (Ben) or the room and students caused the distraction (Theresa). As a result, these practices created a disconnect among the students and their classmates. Not only did teacher beliefs play a role in participation, but teaching strategies also affected participation.

Teaching strategies and participation. The teaching strategies that teachers utilized in the classroom also affected the amount of classroom participation. When teachers provided the necessary supports for individual student needs, participation increased. Teaching strategies differed between teachers and teachers used the iPads in different ways. In the preliminary interviews conducted with the teachers, teaching pedagogies also varied. Mrs. Tindle expressed to me that differentiation strongly influenced their teaching pedagogy:

Mrs. Tindle: I think that I am very fair with them and I am also very realistic. I know that some of my students cannot do half of the assignments I give them but by differentiating for them, making them feel like they've done something good...they know I want the best for them.

Mrs. Tindle explained that she used the iPad to differentiate the curriculum for Ben. She explained that she used the different apps, especially BrainPop to appeal to Ben because he loved music and watching videos. I did not see this in the observations. Mr. Pine also explained how differentiation played a part in his teaching:

Mr. Pine: What makes me a good teacher is always willing to learn new things, patience with students, being flexible, being willing to adapt instruction on the fly to students' needs; I can roll with anything that is thrown at me if need be, and I think probably what really helps me reach the kids is being able to establish a rapport with them and being able to connect at their level.

He explained in the interview that since he loved learning about new technologies, especially iPads, he used the devices in a way that enhanced the learning process for his

students. He also explained that he always tried to incorporate the iPads into the different areas of the content because it provided an avenue for students with disabilities to learn how to use a piece of technology in a way that helped to level the playing field and make things easier. The data from the interviews and observations suggested two main areas influenced teaching: individualized learning and repetition/reinforcement. Each affected student belonging in different ways.

Individualized learning. Teachers felt that it was important to create an individualized curriculum for a student with a disability because they wanted to meet the needs of the students. Teachers individualized learning through differentiation and the adaptation of instruction. Each of the teachers believed that adapting instruction was important for students with low incidence disabilities because of the wide range of needs. Mr. Pintak strongly believed in viewing the student holistically. He believed that teachers needed to spend less time worrying about test scores and more time working on building up the different parts of the child. The teachers also expressed that being a teacher involved caring for the students. When asked about herself as a teacher, Mrs. Credence expressed the importance of wanting the best for the students:

Well, I have been doing this 32 years, and I think I have seen so many programs, so many initiatives, so many curriculums come through that I have decided the bottom line instructionally in a classroom is you have to do what is best for your kids.

She explained that she believed in trying new things, but she knew that only using one method of content delivery did not benefit her students, so she made sure there was a balance between the technology usage and other content delivery methods. Mrs. Tindle, Mr. Pine, and Mrs. Mellet also all agreed; they believed that teachers needed to be flexible, patient, fair, realistic, and create a classroom where the students felt safe and

respected. As Mr. Pine articulated, by establishing a rapport with the students and connecting with them, it was easier to reach them at their level.

Three out of the four classroom teachers integrated iPads by differentiating instruction based upon their student. Mike's team of teachers uploaded Mike's textbooks on his iPad so that he had access to the books during any part of the school day. The access to online texts benefitted Mike because he then did not have to carry around large, heavy books. Billy's teachers individualized his learning based upon his needs at specific times. During one observation, Billy's special education teacher noticed that Billy was not attending to his worksheet. Mr. Pintak also knew that Billy would be more engaged and motivated to do his work if he could finish it fast to move onto the iPad. In my interview with Billy, he told me that he enjoyed using the iPad because he could play games independently. Since Mr. Pintak also knew that playing games on the iPad motivated Billy, he covered up half of the problems so that Billy could move on to the app on the iPad. Finally, Theresa's one-to-one aide provided her with individualized instruction. Mrs. Chancy knew what apps motivated Theresa and kept her engaged, which did not affect her behaviors. As a result, she had Theresa use these apps when she became frustrated. Unfortunately, there was no relationship between the apps and the content. The apps kept her occupied because she enjoyed playing them. When the teachers took the time to individualize the instruction whether that meant differentiating or modifying, the students' participation increased and they continued to learn. When individualized learning occurred out of the context of the learning environment, student participation lessened, as in the case of Theresa.

Repetition and reinforcement. Teachers expressed that repetition and reinforcement were important aspects during iPad integration. Mrs. Chancy explained that it helped to build the skills of the student. Mrs. Tindle believed that when you paralleled learning activities to student interests, the students also benefitted. Unfortunately, I did not see Mrs. Chancy use the iPad in a way that built upon Theresa's skills. Instead of providing instructional activities for Theresa to reinforce concepts and provide repetition of content, she gave her activities on the iPad that did not relate to educational content. These included a color by number app, Splash Math app, and a puzzle app. During one observation, Mrs. Chancy explained that Theresa's behavior often affected what she finished during the instructional time. During this particular observation, Mrs. Chancy said, "Theresa has been very giggly and not able to sit. I don't know how much you are going to see today." She told this to me multiple times, as I entered the room. Mrs. Tindle also believed in creating learning activities that allowed students time for practice and reinforcement, but she did not provide these activities to Ben. Ben's access to the iPad was teacher-controlled, so he rarely used the device during classroom instructional periods.

One teacher, Mr. Pintak, did put into practice instructional activities that promoted repetition and reinforcement. During the math classes that I observed, the teachers often tried to provide all of the students with different ways to practice the content. I observed in handwriting and math class examples of repetition and reinforcement. During the handwriting observations, the teachers let the students practice their cursive letters via paper and pencil, and for extra practice, they focused instruction on the whiteboard app where the students practiced writing the letters with their fingers.

During a math observation, all of the students worked on measurement questions using a ruler and then the teachers instructed the students to practice measurement questions on the iPad. At this point during instruction, the students worked on IXL (an online site that provided practice questions related to the common core). The students used the iPad to manipulate objects to measure them on the iPad ruler. The students manipulated the objects or the line that they needed to measure and moved them so that they lined up with the ruler. The goal was for them to line the object or line up with the zero on the ruler and then measure the length of the item. Billy used the iPad during the last observation in which I observed him working with Mr. Pintak during his pullout time. Billy worked on manipulating place values on the iPad to extend his math class topic. The extra practice allowed Billy to build his independence.

In Mr. Pintak's case, when he provided extra practice to the students by letting them use their iPads and reinforce content that they had already learned, the students benefitted more because they learned the content in multiple ways. Unfortunately, these opportunities were unavailable to the other students because their teachers chose not to use the iPads in this manner. The teaching strategies used in the classroom directly affected competence and participation and not always in a positive way.

Conclusion

Chapter Five discussed the story of student competence. Theresa's teacher believed that Theresa could accomplish many things, but the teacher's actions proved otherwise. Mrs. Chancy planned iPad usage as a way to keep Theresa busy and not connected to learning activities or communication. Ben's teacher said she loved using technology in the classroom, but then never used the iPad with him. Mike's teachers

used the iPad in their classroom to promote his accessibility, but this usage did not extend to other settings. Finally, Billy's teachers believed that the iPad enhanced his learning and therefore used it all the time with him. Unfortunately, Billy's usage was the same as all the other students in the classroom.

By incorporating stories of the teacher's beliefs about education and iPad integration, I tried to show the individual teacher's thoughts and practice of these beliefs. The explanation of the teacher actions then further supported or contradicted the beliefs of the teacher. I found misalignment between teacher beliefs and teacher practices. The teachers expressed their beliefs in differentiating instruction and providing the students with the tools to succeed, but during iPad integration, I saw them not integrate the iPads but the teaching assistants using the devices. I also determined that iPad apps did not support communication and academics, but rather iPad usage related to engaging and occupying the students, thus stifling participation.

The stories about the teacher beliefs and teacher actions helped to paint a picture of what happened in each classroom and how the presumption of competence related to the integration of iPads in the classroom and participation. In the end, the teachers' actions spoke louder than their words.

CHAPTER SIX: DISCUSSION & CONCLUSIONS

Final Words

As I reflect on my research, I realized there were changes I thought needed to occur for these students' educational programs; also, I realized I had seen great lessons and activities using iPads. The four schools that I visited used the iPads in different ways to meet the needs of their students. My observations of iPad usage varied from school to school, student to student. I uncovered some significant issues that occurred in schools with iPad usage, especially through Theresa and Ben's stories. My findings brought to light both positive and negative usages of iPads.

In the Everly District, Mike's teachers impressively integrated the iPad into his everyday math routine. Even though the teachers were still making improvements on integrating the iPad into every lesson activity, they mastered integrating the iPad into whole group instruction. These teachers used the iPad as a learning tool and as a visual aide. In the Wellington District, where I met Billy, I noticed that the teachers used the iPads during every aspect of his day. Not only could Billy use his iPad whenever he needed it, but all the students had the option of using the iPads to accomplish daily tasks. The district seamlessly integrated the devices into every aspect of the school day so that all students had the advantage of learning through technology. In the Littleton District, the teachers learned that the iPad kept Theresa occupied during the school day. The teachers provided options that heightened Theresa's interest and engagement, but in the last school, the Cedar District, I saw few usages of the iPad by Ben. From emails with the teacher and a preliminary email with the speech teacher, I gathered that Ben used his iPad mainly for communication purposes. I did not see the device used for

communication purposes in either of my observations. Each of these teacher participants integrated the iPad in different ways. From learning tools to communication tools, the integration of the iPad varied. As the teachers learned more about the devices, they felt more comfortable integrating them in different ways.

Impact of Findings

After evaluating the data, I determined that technology usage in regards to my participants was stagnant. I saw teachers integrating devices into the classroom with emphasis on usage rather than on how the integration methods could enhance student outcomes. The National Center for Education Statistics (2002) explains that technology integration is always evolving. “Integrating technology is what comes next after making the technology available and accessible. It is a goal in process, not an end state” (U.S. Department of Education, National Center for Education Statistics, 2002, p. 75). The publication goes on to explain that perfect technology is inherently unreachable because, “technologies change and develop, students and teachers come and go-things change” (U.S. Department of Education, National Center for Education Statistics, 2002, p. 75). As technology evolves, teachers need to integrate technology meaningfully, especially to meet the needs of their students. I did not see the evolution of use in my teachers. The teachers used assistive technology with students with disabilities without aligning the usage to their goals and needs. According to the Federal definition of assistive technology, devices should increase, maintain, or improve the capabilities of a student with disabilities [IDEIA, 2004, 20 U.S.C. § 1401 (251)]. The point to make is that once teachers integrate these devices, they need to push themselves to use these devices to institute change and increase student success and performance.

What would it take in order to make these changes? Returning to my theoretical framework, I think that it would be important first to establish a social constructionist mindset. Incorporating the ideals of the social construction of disability, one must understand and celebrate the uniqueness of the individual (Jones, 1996). With the individual in mind, a teacher could then work toward meeting the needs of that student. Teachers must embrace the process of technology integration, which involves a mindset of continuous change, learning and improvement (U.S. Department of Education, National Center for Education Statistics, 2002). As a result, teachers who integrate technology as an educational or assistive technology tool must be willing to make their classroom more student-centered. The National Center for Education Statistics explains that multiple agencies struggle with the definition of technology integration, but in the end have agreed that the major theme of all definitions is, “Technology is a tool or a means to an end goal-it is not the end itself (U.S. Department of Education, National Center for Education Statistics, 2002, p. 75).

Overview of Findings

The following chapter addresses my overall findings and the connection between the literature and the findings. In Chapter 4, I focused on the stories of the four participants. Mike’s usage of the iPad related to gaining visual access to the general education classroom. Billy’s usage paralleled universal usage because he used the iPad just like all of his second-grade peers. Theresa used her iPad as a way to occupy her time. Her teachers felt that the iPad was a means to keep her busy. Finally, Ben rarely used the iPad. These findings emulate the fact that students use iPads in a variety of

ways. When the students used the iPads for their intended purposes, they encountered positive academic, communicative, and social outcomes.

In Chapter Five, I stated that teacher beliefs had a strong connection to teacher practices. Through the data analysis process, I discovered that teacher beliefs about student competency played a role in how the teachers integrated technological devices. The teachers in my study expressed their beliefs that their students could achieve. They also expressed their belief in the benefits of iPad usage and relationship to individualized learning and repetition/reinforcement. These beliefs did not always hold true in what I saw during the integration process. The practices of the teachers often did not align with their beliefs. I found that the teachers held assumptions of what the students could or could not do and these assumptions affected the integration of the devices. In Theresa and Ben's case, the lack of usage of the devices led to a lack of participation in the classroom. As a result, the teachers' actions spoke louder than their words and this ultimately affected the positive integration of the iPads.

It is for these reasons that I provide a means to consider the findings associated with this study and discuss how the findings from this study relate back to the literature review and the theoretical framework. I also share implications regarding the strengths and limitations of the study and the possibilities for future research. In the end, I provide my final thoughts for how the integration of technology can ultimately affect the roles of competency in the classroom.

Discussion of Key Findings

Through data analysis, I came to two major findings. First, I determined that the stories of each of my participants differed. This difference was due in part, to how the

teachers integrated the iPads into the classroom. The second major finding alluded to the fact that teacher practices ultimately affected student outcomes in both positive and negative ways. I supported each finding through the research I completed for my literature review and I connected it back to my theoretical framework and key concepts.

Diversified usage. My findings supported the fact that teacher integration and student usage of iPads varied, which is not surprising. The students' usage ranged from visual access (Mike), universal access (Billy), occupying time (Theresa), and non-usage (Ben). I found that the method the teachers used when integrating the iPads into the classroom greatly affected the academic, communicative, and social opportunities of the students. In each participant story, the integration methods differed and as a result, the methods influenced the student's opportunities within the classroom. I found that these technology integration methods could best be described through the models of An and Alon (2013).

Technology integration methods. The An and Alon (2013) study proposed a model for the usage of iPads in K-12 classrooms. As discussed in Chapter Two, the authors found that there were four ways that teachers integrated iPads into the classroom. The four ways included the everyday, everywhere model, student-centered model, teacher-centered model, and the technology-centered model (An & Alon, 2013). In my participant profiles, I saw the iPads used in various ways. When students used iPads, their participation also increased. An and Alon provided a framework for what I saw in the classroom. By using the iPads in the classroom in different ways, the teachers met the needs of their students and provided them with a tool that helped them during the learning process as well as a means to participate.

I found that these models mirrored some of the ways that the teachers integrated iPads into their classrooms and with their students. Mike's usage of the iPad mimicked the everyday, everywhere model. Mike's story related to the everyday, everywhere model because he used the iPad throughout his school day for multiple reasons. Billy's iPad usage mirrored two of the An and Alon (2013) models. The everyday, everywhere model fit Billy's story because he had control of his iPad and used it for multiple purposes and in multiple settings. Billy's iPad usage also connected to the student-centered model because the teachers promoted the technology usage, a main tenet of the student-centered model. Theresa's iPad usage also mirrored the everyday, everywhere model. Theresa used the device throughout her entire school day. Finally, Ben's iPad usage proved to be a mix of the student-centered model and the teacher-centered model. His usage did not necessarily fit the student-centered model, but his peer's iPad usage fit this model. His classmates had their iPads located in their classroom in a cart and when directed by the teacher, they used them. Ben's usage mirrored the teacher-centered model because he did not have the same opportunities as the other students. His one-to-one aide controlled when and where he used it. I determined that when the teachers used the iPad as an assistive technology tool, they provided greater opportunities in academics, communication, and social interactions. When the teachers did not use the iPads, the opposite occurred.

Gains in educational opportunities. In two of the schools, the teachers used the iPads as assistive technology tools. Mike's teachers integrated the iPad into the classroom as a way for him to visually access the content. Billy's teachers integrated the iPad into the classroom as a way to provide him with another avenue for learning.

Theresa and Ben’s teachers were supposed to integrate the iPads as a means for communication, but unfortunately did not integrate them in this manner. As stated in Chapter Two, the Federal definition of assistive technology is, “any item, piece of equipment or product system, whether acquired commercially or off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities” [IDEIA, 2004, 20 U.S.C. § 1401 (251)]. Multiple authors pointed out the importance of using assistive technology with students with disabilities. These authors agreed that assistive technology provided the necessary supports and scaffolds that students with disabilities needed (Bouck et al., 2011; Caverly & Fitzgibbons, 2007; Judge, Floyd, & Jeffs, 2008). Mike used the iPad to help him visually. He used it independently and was able to control and modify the content. Both Duhaney and Duhaney (2000) and Alexandersson (2011) found that using assistive technology in this manner not only promoted cooperative learning, but also allowed students to take control of their learning. In Mike’s case, the iPad provided another avenue for interacting with his peers and the content as well as the opportunity to determine how and when he would learn. In Billy’s case, the iPad provided different learning opportunities. He interacted with the content and curriculum through different modalities of learning. Duhaney and Duhaney (2000) and Ellis (2011) agreed that assistive technology enhanced the learning experiences of students, just as the iPad enhanced Billy’s learning experiences. Specifically, Ellis (2011) found that assistive technology tools enhanced personalized learning opportunities, the extension of learning, and increased engagement. Billy experienced enhancements in each of these areas. His teachers personalized his learning by allowing him to use specific apps, extended his

learning opportunities through usage in all settings, and provided engagement opportunities that motivated him to learn. In the end, Billy's teachers created unique, new learning opportunities through the integration of the iPad.

Mike and Billy's stories portrayed the successful integration of iPads into the classroom as a form of assistive technology. Just as Gray et al. (2011) and Ruggiero and Mong (2015) expressed, the teachers went beyond just acquiring the devices to successfully integrating the devices to meet the students' needs. The teachers went beyond traditional usage of technology to using the technology to support specific students. Ruggiero and Mong (2015) explained that teachers that successfully integrated technology in their classroom often mastered multiple stages of the integration process. These stages included a focus on technology integration as a process to create learning, designing and restructuring lessons based on student needs, the range of technology usage according to the area of need, and seeing the value of technology (Ruggiero & Mong, 2015). In both cases, the teachers found ways to use the iPads as a means to enhance the educational opportunities of these students. For Theresa and Ben, the non-integration of the iPad negatively affected their educational outcomes.

Stifling educational opportunities. Unlike Mike and Billy, Theresa and Ben did not use the iPad in a manner that promoted their educational goals. For Theresa, her teacher expressed that her iPad usage helped her with communication. Her mother also confirmed that the reason they chose the iPad was so that Theresa could continue to work on communication with the same device in school and at home. Ben's teacher also expressed that the iPad allowed Ben a voice. Unfortunately, neither Theresa nor Ben's teachers used the iPad to support their communicative needs. Much of the literature I

found supported the fact that there needs to be a strong correlation between the usage of assistive technology and student needs. Jackson (2005) found that the missing link between student needs and assistive technology usage often resides in the fact that teachers are ill informed on how to best service their students with low incidence disabilities. Both Theresa and Ben fell on the Autism Spectrum, thus falling within the category of low incidence disabilities. Even though much of the literature agreed that the usage of AAC (augmentative and alternative communication) devices helped increase communication in students with autism (McNaughton & Light, 2013; Miranda, 2008), teachers did not feel as comfortable integrating these types of devices into the classroom (Connor et al., 2010). The teachers provided fewer integration opportunities for Theresa and Ben, and as a result, they stifled their opportunities for positive educational outcomes.

Ben not only had limited chances to use the iPad for communication, but within the classroom, I did not see him use the iPad at all even when all other students used the devices. His non-usage directly correlated to the research I found on technology abandonment. The research I found on abandonment often referenced teacher's lack of knowledge about devices as the main reason for device abandonment (Alper & Raharinirina, 2006; Bushrow & Turner, 1994; Dyal, Carpenter, & Wright, 2009; Phillips & Zhao, 1993). I found these abandonment issues to hold true in my data, as well. Multiple teachers expressed one reason they did not use technology was that they lacked knowledge and training in using and integrating the devices. Gray et al. (2011) and Chmiliar and Cheung (2007) explained that in order for abandonment issues to subside, schools need to provide supports to teachers on how to use the device and also on how to

best integrate the device in order to heighten student success. This led to my second major finding of the study.

Effects of teacher practice. I determined that teacher beliefs often did not align with teacher practices. The teachers expressed the importance of integrating technology appropriately and that technology provided benefits, but in the end, their actions spoke louder than their words. As a result, the teachers' practices ultimately affected student educational outcomes. All of the teachers expressed added benefits to using iPads in the classroom including hands-on learning, incentives, motivation, engagement, independence, reinforcement, and lesson support. Mrs. Credence believed that the iPad allowed for pacing alternatives and provided additional practice. Mrs. Tindle found that iPads promoted avenues for communication with students who were non-verbal. Mrs. Mellet and Mr. Pintak also agreed that iPads allowed for additional communicative support and that when students could communicate, other issues dissipated. Mrs. Chancy believed that iPads kept Theresa engaged and motivated in the learning process. These statements of the benefits echoed the research I found on the benefits of iPads in the classroom. Campaña and Ouimet (2015) specifically addressed the benefits to increased communication due to iPad usage. Gray et al. (2011) explained further that when students had the opportunity to communicate, they expanded upon other areas of their education including the ability to take responsibility and ownership of their learning. Flewitt, Kucirkova, and Messer (2014) also explained that with students with disabilities, iPads enhanced their educational opportunities by providing immediate rewards and increased engagement. As a result, the technology had a positive effect on the educational outcomes of students with disabilities, if integrated successfully.

Technologies influence on education. Technology integration influences students in a multitude of ways. It is not necessarily about the availability of technology, but how and if teachers use that technology. The practices of the teachers including the usage or non-usage of technology affected the inclusion, participation, and membership of each of my participants. The inclusion of students played a part in building their classroom community. In classrooms where the teachers incorporated the students and made them a part of a classroom community, there seemed to be a greater sense of membership in the room and heightened opportunities for participation. iPad integration in the classroom influenced the students' inclusion into the classroom and ultimately affected their membership and participation.

Inclusion in general education and the effects on membership and participation. Harman (n.d.) explained the importance of inclusion, "Inclusion is about helping everyone" (p.1). Inclusive schools focus on helping everyone, implementing changes that support the success of a child, and providing additional adaptations and services to students who need it (Harman, n.d.). The integration of technology helps many schools to achieve an inclusive mindset. I found that the integration of iPads with students with low incidence disabilities provided a way for them to participate in the classroom. As a result, the iPad or any technology device became the gatekeeper for inclusion in general education. It showed that the teachers and/or schools worked to include the student in any way, which included providing a form of technology that helped them learn better, communicate more, or move easier. Technology provided these students with added opportunities for participating in everyday classroom routines and activities (Judge, Floyd, & Jeffs, 2008). Having access to assistive technology like an iPad allowed

students to use the device to access standard learning tools to participate on an equal basis with their peers. I saw students use iPads for various daily activities and in addition, they supported any child's learning (Judge, Floyd, & Jeffs, 2008). As explained in Chapter Four and Five, the students used the iPad for organization and scheduling (Theresa), visual improvements (Mike), connecting to classroom displays (Mike), and for reinforcing the content material (Billy). I saw the teachers integrate the iPads in ways that enhanced membership and participation as well as ways that hindered membership and participation. iPad usage heightened student participation and membership when the usage related to student needs as stated in their IEP. It also hindered participation and membership when the teachers chose not to integrate the devices.

The stories of Mike and Billy exhibited ideals of strong membership. Mike's teachers moved toward access concerning iPad usage. The teachers understood what it meant to integrate the iPad into the math classroom so that Mike engaged in the content projected on the board. They had not yet determined how iPad usage could be beneficial throughout the entire school day and in other content areas. During math class, when iPad integration occurred, Mike's membership and participation in classroom activities equaled the other students. He had the same opportunities to participate and engage in classroom activities. Billy's usage of the iPad allowed him to heighten his learning experiences and advance his participation in the classroom. Billy's teachers used the iPad as a tool for all students to interact with the content. Billy benefitted from this type of usage because his IEP called for repeated practice of content material. His inclusion in the classroom was just like the other students in the classroom because they all used the same technology tools during classroom activities. For both Mike and Billy, the usage of

the iPad reflected the teachers' high expectations for each of the students. Having integrated the iPads in meaningful ways and connected to the content allowed Mike and Billy the same opportunities for participation and classroom membership.

Non-usage of the iPads also occurred and created more of an exclusive attitude toward membership rather than inclusive. For Theresa and Ben, where the usage of the iPad could have been for communicating between peers, the non-integration resulted in a separation of the student from the classroom community. As a result, their classroom membership suffered. Weibe Berry (2006) found that moment-to-moment interactions affected the learning context and resulted in the inclusion or exclusion of students during activities just as it did in Theresa and Ben's case. With Theresa and Ben, exclusion from learning with their peers occurred. With the decisions about how and whether to integrate the iPad, the teachers ultimately made the decision whether or not to include the student and when.

When the teachers did not use the iPad for communication, students' participation also suffered. Theresa and Ben needed the iPad to help with communicating in the classroom, but I saw them using the iPad more for entertainment purposes. The research I looked at also fell short in this place. I found few researchers who evaluated the usage of iPads as instructional tools in special education (O'Malley, Lewis, & Donehower, 2013; Reichle, 2011). I found in the research that teachers of students in special education used the iPads as a way to entertain the students. Flewitt et al. (2015) referenced this term as an edutainment app. Edutainment apps are apps that educators use but are meant to entertain the student rather than customize the content (Flewitt et al., 2015). I found little research that alluded to the reason behind why teachers might use

the iPads more for entertainment than addressing specific student needs. I have a feeling that teacher knowledge and comfort level played a part in meaningful technology integration.

Runyan (2013) found that the usage of technology benefitted students' learning in multiple learning environments and helped students access the curriculum, increase social engagement and interaction, build upon skills, and increase participation in instruction. I specifically saw increased access to the curriculum and skill building with the iPad.

Researchers found a link between the teachers knowing the content and how a piece of technology changes the content (Debele & Plevyak, 2012; Mishra & Koehler, 2006).

When teachers integrated a piece of technology needed by a student into the curriculum, positive outcomes such as a more inclusive atmosphere emerged. As a result, the usage or non-usage of the device influenced the educational opportunities of the four participants. When used appropriately to enhance instruction or provide assistance, the iPad had a positive influence on the student's educational experiences. I did not find this surprising, as much of the research supported this idea.

I found that the teachers believed in the importance of using technology in the classroom, but they did not have an understanding of what "usage" meant. Usage goes beyond having the students interact with the devices. It involves purposefully incorporating the devices into lessons and activities so that teachers support the educational needs of students. In the end, I found that the teachers in my study greatly influenced the students' educational opportunities through their method of iPad integration. As a result, the teacher's practices greatly affected the student's academic, communicative, and social opportunities.

Implications for Research

This research study evolved from what I experienced in the classroom. As a teacher who tried to integrate iPads with all students, I saw the benefits of the integration process as highly positive, but once out in the field, I saw that everyone's experiences varied. Thinking back to my own experiences of iPad integration, I would now make many changes to the ways I integrated the devices. First, I would make sure I went beyond the simple method of "just using" the devices. I would incorporate purposeful planning into how I enhanced my educational strategies using the devices. I would also make sure that my teaching methods aligned with specific student needs. The National Center for Education Statistics (2002) encourages schools to ask themselves key questions about their evaluation of the integration of technology:

- Are teachers proficient in the use of technology in the teaching/learning environment?
- Are students proficient in the use of technology in the teaching/learning environment?
- Are administrators and support staff proficient in the use of technology in support of school management?
- Is technology integrated into the teaching/learning environment?
- Are technology proficiencies and measures incorporated into teaching and learning standards?
- Are technology proficiencies and measures incorporated into student assessment?
- Is technology incorporated into administrative processes? (p. 77-89).

These key questions support the fact that schools must consider all parties involved.

Teachers, students, and administrators are all responsible for the successful integration of these devices.

I found that there is more than just support and trainings that schools need to establish in order for technology integration to be successful. I found in my study that the teachers' beliefs affected the integration of the iPads. Particularly, the idea of ableism

ultimately affected the non-usage of the devices. As addressed in my theoretical framework, ableism is the idea that there are preferable ways of living within our world and those ways reflect non-disabled ways of being (Ashby, 2010; Hehir, 2002; Storey, 2007). The teachers in my study that did not use the iPads with their students came across as having lowered expectations for these students. Theresa and Ben's teachers preferred that they communicate verbally rather than use their devices for communication purposes. As a result, the teachers' ableist mentality affected device non-usage and not training and support. Schools and administrators need to not only address the technical aspects of technology integration, but also address the larger issues of teacher beliefs. Therefore, in addition to the questions posed above from The National Center for Education Statistics, I would also urge schools to identify teacher beliefs as well as how schools can change these beliefs if they reflect an ableist mentality. Some questions teachers need to ask themselves:

- Do I believe that students with disabilities cannot succeed like my non-disabled students?
- Do I believe that there is one right way to do something?
- Am I hesitant to integrating technology with students with disabilities in order to help them achieve their goals?
- Do I have lowered expectations for my students with disabilities?

In schools, if any teachers answer "yes" to these questions, then administrators need to address the bigger issue at hand. Even if schools provide trainings and support to address technology integration, if teacher beliefs do not align with a social constructionist mindset, then technology integration for students with disabilities will fail.

As with any study, there were strengths and limitations. It was my hope that the strengths of this study far outweighed the limitations. Additionally, I included

implications for practice for teachers integrating iPads in the classroom with students with disabilities.

Strengths. This study had several strengths that I hope help to inform teachers and other school personnel about the ways in which iPad integration can positively affect students with low incidence disabilities and help to enhance student inclusion. Even though my focus was on students with low incidence disabilities, I found that many of the observational events infiltrated across the entire student body. The focus of one group of students provided a clue into a bigger population. Some barriers that inhibited iPad integration occurred across all settings. The benefits of using technology when related to student needs helped not only the students of focus but also any student that had a need. I saw this with Mike's usage of the iPad. The teachers integrated the join.me app in order for Mike's visual access, but all students could have benefitted from the usage of this app if the technology was available. The teachers could have incorporated this app for everyone's usage to increase collaboration among students. Therefore, some of the lessons about positive integration apply across student populations. Through examining the experiences that teachers had in classrooms with integrating a specific piece of technology, I learned about the usage of the devices and how to improve their usage. I believe that other school personnel or administration would be able to gather insight into what might be happening in their schools. This study provided stories of four different classrooms and four different students, but through the story, it explained to the reader that every situation was different. If schools did not provide teachers the appropriate supports to integrate a piece of technology successfully, then successful integration did

not happen. I hope that school personnel read this research and it prompts them to take a deeper look at what is happening in their classrooms with technology integration.

The focus of students with low incidence disabilities was appropriate because there was little literature out there that focused on this group of students. Fewer studies existed because of the low percentage of students identified as having a low incidence disability. In addition, the placement of these students occurs most often in separate classrooms than their peers. Therefore, this study shed light onto a specific population of students included in the general education classroom. With little research available, this study provided added information about a group of students that teachers may be struggling to support in the classroom.

Finally, the last strength revolved around the relevancy of the topic. iPad integration occurs in today's classrooms because the devices are more cost effective and portable than other forms of technology. They have seen increased usage with students with disabilities because of these same reasons as well. Many of the research studies on iPad integration focused on the relationship that iPads had in regards to student engagement, motivation, and academic achievement. As reiterated by my participants, these three areas enhanced the integration of iPads, but they were unable to come to fruition unless teachers effectively integrated the devices. As a result, this study looked into how the teachers integrated the iPads with their students. I discovered stories about specific students' use of iPads and how this usage benefitted or hindered the educational experiences of these children. This study provided a story about how teachers integrated iPads rather than the results of integration.

The significance of this study focused on teachers and other school personnel gaining a better understanding of how the integration of iPads affected students with low incidence disabilities in the classroom. It will hopefully help teachers to understand an often-marginalized student population as well as provide teachers the opportunity to reflect on their practice and model integration methods. Finally, this study provided insight into how teachers' usage of technology could improve classroom supports, educational outcomes, and technology usage.

Study limitations. Limitations to this study revolved around a few different areas. These included my sample size, narrow focus on students with low incidence disabilities, the usage of iPads, and the shortened time for data collection. The sample size of my participants was low because of the population of students I looked for. I had a narrow view of students with low incidence disabilities because out of the four participants I had, I only had two different disabilities portrayed. Another limitation could be the participants' identification because of the number of students identified within this category of disability. Students in schools that fall under this category account for no more than 1% of the student population (Jackson, 2005). This related to a limitation because the study's generalizability lessened. Therefore, readers of this study would have to either be familiar with this particular group of students or have taught them within the general education setting. The limitation indicated a need for further study not only with this group of students because of limited research, but also for any group of students utilizing this form of technology.

Another limitation to this study revolved around the narrow focus of specific technology usage. For this study, I chose to focus on iPad usage in the classroom. The

focus of iPads provided a limitation because of the multitude of technologies available to schools today. iPads are one form of technology manufactured by only one producer. This study did not take into consideration the various other forms of technology used educationally in the same way or ones that produced the same benefits. I tried not to generalize across all forms of technology or even all tablets. Consequently, future studies could focus on the usage of tablets in the classroom with students with low incidence disabilities.

The last area that I considered a limitation was that I only conducted a limited amount of observations with Ben. I was limited with data from Ben because the teacher refused to continue contact with me. After observing twice, the teacher suggested that I continue my observations in the speech room because that was where Ben spent most of his time. The teacher felt bad that Ben left the room during my observations that she suggested I observe Ben in other spaces. In the end, these limitations affected the amount of data I collected. In a future study, I would hope to spend as much time as I could in each of the settings. In addition to the limitations identified above, there were also limitations to the design.

Design limitations. One challenge to qualitative research was that I had to ensure trustworthiness. Trustworthiness represented a challenge because of the emancipatory goal of ultimately trying to free individuals from domination and repression (Anderson, 1989). There were different types of trustworthiness issues in this study. Attrition was an issue concerning the study because I wanted to interview and observe the same participants. It was crucial to have participants stay in the study because of the completion of interviews and observations with the same participants. During one of my

case studies, I completed an interview with the general education teacher and observed in her classroom two times and then she suggested to me that I continue my observations with a different teacher. This loss of a participant affected my ability to conduct additional observations but allowed me to investigate why withdrawal occurs.

Triangulation was also another area considered a limitation. Triangulation depended on the convergence of data through multiple sources (Mawson, 2007), so it was imperative that I collected data in multiple ways and over a longer period. These were some of the limitations of the study.

The limitations of this work proved the need for further research within this realm of study. In general, more research-based studies and practical-based articles need to become available so that teachers and researchers can easily access this information. Possible future research could include a wider participant pool, integration of different forms of technology, different data collection procedures, and connections between school and home usage.

Recommendations for future research. In this research study, I attempted to increase my understanding about the usage of iPads with students with low incidence disabilities. Previous literature focused heavily on the general student population and their usage of these devices with a concentration on how iPads affected engagement, motivation, and achievement. The qualitative methodology provided a narrative of four schools and the teachers' usage of iPads with their students with low incidence disabilities.

This study represented a start for future research in how specific technologies could help students with low incidence disabilities achieve their educational needs.

Through future research, teachers will have a better understanding of integrating technology in the classroom. This will also help to alleviate the limitations to my study.

One limitation of my study was that I focused solely on iPad usage. Future research would be helpful within the area of how any tablet benefits students with low incidence disabilities. Researchers could look into why teachers and schools choose certain tablets over other tablets, what tablets seem to provide the most benefits, and how teachers use them in the classroom to help meet the needs of the students.

Another future study could look into the most effective usage of the iPad for not just students with low incidence disabilities, but any student. I looked into what happened in the classroom and what types of activities occurred with the usage of iPads in connection to just students with low incidence disabilities. It might benefit teachers if a researcher explained effective usage of iPads or best practices so that teachers could use this information in making informed academic decisions for all students. This type of study could use a wider sampling group through different data collection procedures to garner the “bigger picture.” This future study could also integrate a practical piece through the creation of a toolkit of activities available for teachers to use while planning for iPad integration in their classroom. To complete this research, the authors would have to define what effective means to them to create a baseline for determining what activities and lessons to include in the toolkit. Finally, this area of research could also build upon the relationship between professional development and technology integration. Intervention studies of teachers who receive professional development on iPad integration with students with disabilities could provide information on how practices change over time due to the addition of knowledge, training, and help.

Finally, a study revolving around the idea of twenty-first-century learners using technology could be useful. Researchers could look into how the usage of familiar devices affects tech-savvy students. It would be worthwhile understanding how naturally tech-savvy students accept a form of technology and learn how to use that technology and if there are benefits or drawbacks in the classroom to being accustomed to using technology. These additional research studies would help to strengthen the amount of research that is available to seekers of information about iPad and technology usage in the classroom with students with disabilities.

It would benefit these future studies to conduct the data collection process in schools where iPads are prevalent. It would also benefit the studies to conduct research over a longer period. This might include diving deeper into one specific low incidence disability or having a larger participant pool with more students with low incidence disabilities. Unlike the shortened time of my study, conducting the data collection process over a longer period would allow the researcher to gain a better understanding of repeated occurrences in the classrooms year after year. Also, looking into one particular low incidence disability category might also allow comparisons around integration practices. These suggestions would enhance the research area of technology and education.

Implications for practice. Integrating any piece of technology, especially iPads could be a daunting task for teachers. Teachers not only need to think about how to use the iPads during the school day, but also how to meet the needs of their students. I found multiple websites that provided information on integrating devices into the classroom, but one specific website provided ample information about using iDevices with students with

disabilities. One particular resource, "App Review for Children with Developmental Disabilities," published by Emily Morlandt and Cindy Miller encourages teachers to first consider the student, their environment, the task, and tool needed (esc20.net). It also provides a list of free iPad apps used in special education as well as a list of additional helpful links. One specific link that I found to be most useful was the direct link to "Apps for Students with Special Needs" (a4cwsn.com). This link included 1000 different apps used in education according to specific student needs and content areas. These two sites provided a plethora of information on how to find apps to support the needs of your students.

During the integration process, teachers also need to be reflective of their teaching practices and pedagogy. It is important for teachers to ask themselves why and how they are integrating these devices into the classroom. In my study, I noticed that some teachers were not asking themselves these pertinent questions. As a result, I created a self-reflective inventory to help teachers wrap their minds around iPad integration in the classroom. Appendix D contains the self-reflective inventory along with additional information on iPad usage. The self-reflective inventory would help a teacher think about the setting of the device usage, who uses the devices, for what reasons, and who plans for the integration.

Final Thoughts

When the teachers integrated the iPads as a form of assistive technology, the iPads improved the academic, social, and communicative experiences of students with disabilities. The first step in teachers utilizing assistive technology with students with disabilities is for the teachers to know that the students are capable of learning,

socializing, or communicating. This is the definition of presuming competence. Presuming competence hones in on the fact that one cannot admit to knowing another's thinking unless the other can reveal it (Biklen & Burke, 2006). In the classroom, teachers should always assume competence (Rubin, Biklen, Kasa-Hendrickson, Kluth, Cardinal, & Broderick, 2001); teachers find ways to support their students so that they demonstrate their abilities and knowledge (Biklen & Burke, 2006). Some of the teachers used the iPads as a form of assistive technology that provided another avenue for allowing their students to demonstrate their knowledge or as a way for their students to communicate their thinking (Biklen, 1990; Biklen & Burke, 2006; Rubin et al., 2001).

Researchers associate presuming competence with the field of students with disabilities along with the construction of educational approaches available to these students (Biklen, 1990; Blatt, 1999; Goode, 1992; Kliewer, 1998). It is common to link delays in children to a presumption of incompetence (Biklen & Burke, 2006). Presumption of incompetence evolves within the confines of a school because the people in schools give labels. Biklen and Burke (2006) expressed this idea of understanding about students with disabilities, "...once labeled students are expected to prove that they can benefit from inclusive, academic instruction in order to be maintained in the regular class, often with supportive and specialized services" (p. 167). Students prove not only their educability but also their inclusion ability (Biklen & Burke, 2006).

I found that the usage of iPads in the classroom allowed students who had trouble initiating thoughts, communicating, or building upon their knowledge to be able to accomplish these acts easier. The technology provided a way for the students to access

the general education curriculum. Bernstein (1996) expressed about the accomplishment of access to the classroom. Bernstein (1996) explained that teachers who believed that all students contributed would create a context (classroom) where acquisition occurred. This included not just inclusion in the classroom but absorption into the classroom socially, intellectually, culturally, and personally, which could relate to access through the form of an iPad.

Through my data analysis, I found that presuming competence in students looked and sounded different. Many of the teachers' beliefs did not align with their practices, and they did not see their own disconnect between their actions and beliefs. Teacher's beliefs about competence affected the usage or non-usage of iPads. In each of the interviews, the teachers expressed that it was important to presume competence for a student because that had a direct impact on the student's ability to achieve in the classroom. Some of my observations negated the teachers' beliefs because their practice went against their statements. The teachers did not see the incongruence between what they did in the classroom and their stated beliefs. As a result, the students were either not given the same opportunities to learn as their peers or the teachers did not provide the chance for them to use their iPads to help them learn in the classroom.

I found previous research that teachers needed to provide the necessary supports to allow their students to demonstrate their knowledge (Biklen & Burke, 2006). iPads enhanced access and allowed another avenue for students to demonstrate their knowledge. When schools provided alternative ways for students to show what they knew instead of proving their competence, meaningful inclusion into the classroom structure occurred (Biklen & Burke, 2006). As expressed by multiple authors, the

presumption of competence meant that teachers tailored instruction and educational approaches to enhance the abilities of students with disabilities (Biklen, 1990; Blatt, 1999; Goode, 1992; Kliewer, 1998). As a result, previous researchers found that students with disabilities developed a means to express their knowledge in learning through the integration of an iPad for either academic or communicative purposes. The participants in my study could have had heightened experiences within the academic and communicative realm if iPad integration occurred.

Conclusion

Teachers in the field have an urge for finding practical usage for technology devices to make learning experiences more student-friendly. It is our goal as teachers to teach to our students' needs and provide them with adequate supports so that all students succeed. As a former classroom teacher, I often inquired about new devices and the potential to provide learning supports to students. From teacher to researcher, I now work at providing current teachers with practical uses for technology devices that we encounter in our day-to-day teaching lives. From the findings of this research, I charge readers to reevaluate how they integrate technology, especially iPads, with their students with disabilities.

School personnel look for ways to include more students into the general education curriculum and access to technology is one way for this to occur. This research provides information on how iPads can promote academic, communicative, and social opportunities if utilized appropriately. It pushes the reader to determine if what they are doing with iPads is enough to enhance these positive opportunities. By examining what occurred in classrooms with the usage of iPads, teachers of students with low incidence

disabilities could take away different strategies on engaging their students and using the iPads to supplement learning activities and provide access to the curriculum. The aim for school personnel should be to understand how to integrate this form of technology with not only those students that have communication, movement, or learning needs but how the devices benefit all students.

The data collected from the interviews and observations in this study generated topics for discussion around the uses of technology in the classroom and how iPad usage helped to open up access to the general education curriculum. I came to find out that there were a variety of benefits and limitations to using iPads in the classroom with students by identifying the needs of each student and how they responded to the technology integration process. As a result, teachers and school personnel reading this study can question their own integration processes and the benefits and/or limitations.

The results of this study suggested that a key message was that the usage of iPads varied with each student. Just as students have different learning styles, students also respond differently to the integration of iPads in lessons and activities. It is the job of the teacher to find out what works for their students so that they benefit the most from the integration process. As educators, this weighty decision becomes ours. How are we going to provide positive social and academic experiences to our students in our classroom through the integration of these technology devices? The opportunities are in our hands, and it is time for us to make changes. As teachers, we need to delve into our own practices and question why we make the decisions we make with the technology we use. Ultimately, how can schools best use their technology to meet the needs of students with disabilities?

APPENDIX A: RECRUITMENT

Administrator Recruitment Letter

Dear Administrator-

My name is Katie Nichiporuk and I am currently working on my dissertation at Syracuse University in the School of Education. My focus is on the use of technology in the classroom.

The aim of the present research is to qualitatively understand how iPads are being used in classrooms to support the needs of students with low incidence disabilities. Through interviews and observations, I will better understand how iPads are being used in the K-6th grade classroom, how the use is supporting specific student needs, and the perceptions of teacher teams, parents/guardians, and student users on the benefits of using iPads and how they open up access to the curriculum. Conducting this research will allow me to streamline and disseminate the most promising practices to a broader audience of teacher educators, teachers, administrators and families.

I would like to ask you for information on certain teams of teachers that are currently using iPads with their students that have IEPs (Individualized Education Program). If possible, please provide me with their name and email so that I could gather more information about how they integrate iPads into the classroom environment.

If you have any questions about the project, please contact the researcher at klnichip@syr.edu or by calling 607-382-5712. If you are willing to provide me the names and emails of any of your teachers, please proceed by emailing me back at klnichip@syr.edu.

Thank You,

Katie Nichiporuk

Teacher Recruitment Letter

Dear Teacher-

My name is Katie Nichiporuk and I am currently working on my dissertation at Syracuse University in the School of Education. My focus is on the use of technology in the classroom.

The aim of the present research is to understand how iPads are being used in classrooms to support the needs of students with low incidence disabilities. Through interviews and observations, I will better understand how iPads are being used in the classroom, how the use is supporting specific student needs, and the perceptions of teacher teams, parents/guardians, and student users on the benefits of using iPads and how they open up access to the curriculum. Conducting this research will allow me to streamline and disseminate the most promising practices to a broader audience of teacher educators, teachers, administrators and families.

You have been identified by your administration as a teacher who works with a student with a low incidence disability that currently uses an iPad. If you are interested, I would like you to take part in my study. This email requires you to answer a few questions about yourself and the students that you work with to determine if you would be a good fit for this study. If you are interested, please fill out the answers to the questions below. These answers will not be used for any part of the study, but are only to determine your eligibility. Once you are eligible to participate, I will have you sign a consent form.

If you have any questions about the project, please contact the researcher at klnichip@syr.edu or by calling 607-382-5712.

Thank You,
Katie Nichiporuk

Pre-screening Questions- Please reply via email with the answers to these questions.

Do you currently have a student using an iPad in the classroom? Yes No

If you choose no, then you are done answering questions.

Does your student who uses an iPad also have a low incidence disability? Yes No
(This includes: blindness, low vision, deafness, hard-of-hearing, deaf-blindness, significant developmental delay, complex health issues, serious physical impairment, multiple disability, autism)

Does your student's IEP state the need for an iPad? Yes No

Is the iPad used within an inclusive classroom setting? Yes No

What is the frequency of use of the iPad in the classroom?

Never Hardly Few days Everyday

Parent/Guardian Recruitment Letter

Dear Parent/Guardian-

My name is Katie Nichiporuk and I am currently working on my dissertation at Syracuse University in the School of Education. My focus is on the use of technology in the classroom.

The aim of the present research is to understand how iPads are being used in classrooms to support the needs of students with low incidence disabilities. Through interviews and observations, I will better understand how iPads are being used in the classroom, how the use is supporting specific student needs, and the perceptions of teacher teams, parents/guardians, and student users on the benefits of using iPads and how they open up access to the curriculum. Conducting this research will allow me to streamline and disseminate the most promising practices to a broader audience of teacher educators, teachers, administrators and families.

You have been identified by school administration and teachers as having a child that currently uses an iPad in the classroom and has a low incidence disability. I would like to observe and interview both you and your child for the purposes of my research project. If you are interested, I would like you to take part in my study.

If you have any questions about the project, please contact the researcher at klnichip@syr.edu or by calling 607-382-5712. If you are willing to participate and also allow your child to participate, please proceed by emailing me back at klnichip@syr.edu.

Thank You,
Katie Nichiporuk

Parental Consent Form



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PARTICIPANT CONSENT LETTER **Parental Consent**

Use and integration of iPads with students with low incidence disabilities in elementary schools

Dear Parent,

I am inviting you and your child to participate in a research study. I am interested in looking at the use of iPads with students with disabilities. This document will explain the study to you, but feel free to contact me if you have any questions or would like me to explain the study in greater detail. The participation in this study is voluntary, so you may choose to be involved or not.

This research will help me to understand how iPads are being used in classrooms to support the needs of students with disabilities. Through interviews and observations, I will better understand how iPads are being used in the classroom, how the use is supporting specific student needs, and the perceptions of teacher teams, parents/guardians, and student users on the benefits of using iPads and how they open up access to the curriculum. Through document analysis of IEPs (Individualized Education Programs), I will better understand if student goals are being met through instruction. Conducting this research will allow me to streamline and provide the most promising practices to a broader audience of teacher educators, teachers, administrators and families.

Participation in this study involves allowing me to interview you about how you think your child benefits from the use of iPads in the classroom to support their needs during the months of September 2015 to January 2016. The duration of participation will take place during these months also, from September 2015 to January 2016. Interviews will take place in a private location within the selected schools that the participant chooses. The interviews will last for about 30 minutes and will not exceed 1 hour. For privacy purposes, the interviews will be conducted one-on-one with electronic note taking occurring. These electronic notes will be password-protected so that access is only permitted to the researchers. Participation also allows me to interview your child about

how they think iPads benefit the learning process and observe them interacting with iPads in the classroom during the months of September 2015 to January 2016. These interviews will also last 30 minutes and not exceed 1 hour. Observations will also take place in your child's classroom to watch him/her use the iPad. These observations will be the length of a content period and not exceed 1 hour a week for six weeks. Finally, participation in this study involves providing me access to your child's current and/or past IEP documents.

I will also be audio recording interviews for the purpose of transcribing what is said and data analysis purposes only. The recordings will only be retained for the length it takes me to transcribe and analyze the data and then will be deleted. Only the researchers will have access to the recordings. Recordings will be kept on a password-protected device.

This study involves minimal risk associated with provision of a confidential document, including the potential for participant identity to be revealed. However, the researchers ensure that measures will be taken to maintain confidentiality, including the removal of identifying information from collected documents. Each participant will receive a copy of the consent form to read over, as well as having it read aloud to them by the researcher if needed. Should participants decide to remove themselves from the study at any time, they can let the researchers know at any time and their documents will be destroyed. The social benefits outweigh the risks as they include appreciation for the participants' support services, and contribution to the knowledge base through publication of the study.

Minimal risks are also involved with the sharing of information from the child and the parent. Child participants will provide information that details their plan for educational supports and services delivered in the classroom, potentially revealing difficulties and struggles in their schooling experiences, which can be a sensitive topic. Parents who consent for their children to participate may also have personal information from the IEP and family sensitive issues shared by their children that come out during the interview process.

The benefits of allowing your child to participate in this study outweigh the risks. Through this study parents will better understand how their child's needs are being supported in the classroom through the use of technology. Child users in the study will benefit from exposure to new technology that is directly related to their educational goals and individual needs, thus strengthening their educational opportunities.

If you have any questions or concerns please contact the researchers:

Katie Nichiporuk

Phone #: 607-382-5712

Email: klnichip@syr.edu

Dr. George Theoharis

Phone #: 315-443-2685

Email: gtheohar@syr.edu

If you have questions regarding your rights as a participant, have questions, concerns, or complaints that you want to address to someone other than the investigators, or if you
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Consent Form 2

can't reach the investigators please contact the Institutional Review Board (IRB) at (315) 443-3013.

Thank you for your interest in this project. I look forward to talking with you.

Best regards,

Katie Nichiporuk

I agree to allow, _____, my child to participate in this study. I also agree to participate in an interview about my child's technology use. I understand that his/her participation is voluntary and may withdraw at any time without penalty. I also certify that I am at least 18 years of age.

I agree for my child to participate in the study: Yes No

I agree to participate in an interview: Yes No

I agree for the interviews to be audio recorded: Yes No

I agree to provide IEP documents for analysis: Yes No

Printed Name: _____

Signature: _____

Date: _____

Investigator Name: _____

Investigator Signature: _____

Date: _____

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Adult Consent Form



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PARTICIPANT CONSENT LETTER **Adult Consent**

Use and integration of iPads with students with low incidence disabilities in elementary schools

Dear Participant,

I am inviting you to participate in a research study. I am interested in conducting a research study on the use of iPads with students with disabilities. This document will explain the study to you, but feel free to contact me if you have any questions or would like me to explain the study in greater detail. The participation in this study is voluntary, so you may choose to be involved or not.

The aim of the present research is to understand how iPads are being used in classrooms to support the needs of students with disabilities. Through interviews and observations, I will better understand how iPads are being used in the classroom, how the use is supporting specific student needs, and the perceptions of teacher teams, parents/guardians, and student users on the benefits of using iPads and how they open up access to the curriculum. By looking at student IEPs (Individualized Education Programs), I will be able to gather data about how student goals are being met through instruction. Conducting this research will allow me to provide information about promising practices of using iPads in the classroom to a broader audience of teacher educators, teachers, administrators and families.

Participation in this study involves allowing me to interview you about how you use iPads during the learning process and observe how this happens during the months of September 2015 to January 2016. The duration of participation will take place during these months also, from September 2015 to January 2016. Interviews will take place in a private location within the selected schools that the participant chooses and will be about 30 minutes to 1 hour in length. For privacy purposes, the interviews will be conducted one-on-one with electronic note taking occurring. These electronic notes will be password-protected so that access is only permitted to the researchers. Also, allowing me to view a student's IEP to gather data about their goals, only if their parents have

consented. The observations will occur in the classroom for the length of a content area, not to exceed 1 hour and will occur weekly for 6 weeks.

I will also be audio recording interviews for the purpose of transcribing what is said and data analysis purposes only. The recordings will only be retained for the length it takes me to transcribe and analyze the data and then will be deleted. Only the researchers will have access to the recordings. Recordings will be kept on a password-protected device.

This study involves minimal risk associated with provision of a confidential document, including the potential for participant identity to be revealed. However, the researchers ensure that measures will be taken to maintain confidentiality, including the removal of identifying information from collected documents. Each participant will receive a copy of the consent form to read over, as well as having it read aloud to them by the researcher if needed. Should participants decide to remove themselves from the study at any time, they can let the researchers know at any time and their documents will be destroyed. The social benefits outweigh the risks as they include appreciation for the participants' support services, and contribution to the knowledge base through publication of the study.

If you have any questions or concerns please contact the researchers:

Katie Nichiporuk	Dr. George Theoharis
Phone #: 607-382-5712	Phone #: 315-443-2685
Email: klnichip@syr.edu	Email: gtheohar@syr.edu

If you have questions regarding your rights as a participant, have questions, concerns, or complaints that you want to address to someone other than the investigators, or if you can't reach the investigators please contact the Institutional Review Board (IRB) at (315) 443-3013.

Thank you for your interest in this project. I look forward to talking with you.

Best regards,

Katie Nichiporuk

I agree to participate in this study. I understand that participation is voluntary and may withdraw at any time without penalty. I also certify that I am at least 18 years of age.

I agree to be interviewed:

Yes No

I agree to be observed:

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Consent Form 1

2

I agree to be audio recorded:

Yes

No

Printed Name: _____

Signature: _____

Date: _____

Investigator Name: _____

Investigator Signature: _____

Date: _____

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Consent Form 1

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Assent Letter Ages 5-6



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PARTICIPANT CONSENT LETTER Assent Letter Ages 5-6

Use and integration of iPads with students with low incidence disabilities in elementary schools

Dear Participant,

My name is Katie Nichiporuk, and I am from The School of Education, at Syracuse University. I am asking you to participate in a research study because you use an iPad in school.

A research study is a way to learn more about people. I would like to ask you questions about how you use an iPad in school for about 30 minutes. This will take place in a classroom in your school. I would like to watch you using them in the classroom for about an hour each week for 6 weeks. What I am going to read will explain the study to you, but let me know if you have any questions. You do not have to let me ask you questions or watch you, if you don't want.

I want to know how your teacher uses iPads with you. I also want to learn more about how you think iPads help you. I will be watching you in your classroom at the beginning of the school year. I will also ask your parents if you can take part in the study.

If you let me, I would like to record what we talk about and I will be the only one to listen to it. I will also write a report about what I learned, but your name will not be used.

There are some things about this study you should know. You may feel uncomfortable sharing the good and the bad things your teacher does with the iPad because you don't like the activities, but it will help me to learn what you need to do better. I hope you help me with this study, so that I can help your teacher learn how to use the iPad with you in new and interesting ways.

If you decide to stop after we begin, that's okay too. You can also skip any of the questions you do not want to answer. If you have any questions, please let me know:

Katie Nichiporuk

Phone #: 607-382-5712
Email: klnichip@syr.edu

Thank You,

Katie Nichiporuk

Investigator Name: _____

Investigator Signature: _____

Date: _____

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Assent Letter Ages 7 and above



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PARTICIPANT CONSENT LETTER **Assent Letter Ages 7 and above**

Use and integration of iPads with students with low incidence disabilities in elementary schools

My name is Katie Nichiporuk, and I am from The School of Education, at Syracuse University (SU). I am asking you to participate in this research study because you use iPads in the classroom.

PURPOSE: A research study is a way to learn more about people. In this study, I am trying to learn more about how iPads are used in the classroom to help students succeed in learning.

PARTICIPATION: If you decide you want to be part of this study, you will be asked to be interviewed and observed. This means I will ask you some questions lasting only 30 minutes, which will occur in a classroom in your school. I will also watch you use the iPad in the classroom once a week for 6 weeks for about an hour. All of this should take about 2 months. I also want to know if I can record the conversations we have together.

RISKS & BENEFITS: There are some things about this study you should know. You may feel uncomfortable sharing the good and the bad things your teacher does with the iPad because you don't like the activities, but it will help me to learn what you need to do better.

Not everyone who takes part in this study will benefit. A benefit means that something good happens to you. We think these benefits might be that I can help your teacher learn how to use the iPad with you in new and interesting ways.

REPORTS: When I am finished with this study, I will write a report about what was learned. This report will not include your name or that you were in the study.

VOLUNTARY: Voluntary means that you do not have to be in this study if you do not want to be. I have already asked your parents if it is ok for me to ask you to take part in this study. Even though your parents said I could ask you, you still get to decide if you want to be in this research study. You can also talk with your parents, grandparents, and

teachers before deciding whether or not to take part. No one will be mad at you or upset if you decide not to do this study. If you decide to stop after we begin, that's okay too. You can also skip any of the questions you do not want to answer.

QUESTIONS: You can ask questions now or whenever you wish. If you want to, you may call me at 607-382-5712 or you may call Dr. Theoharis at 315-443-2685. If you are not happy about this study and would like to speak to someone other than me, you or your parents may call the Syracuse University Institutional Review Board (IRB) at 315-443-3013.

Please sign your name below, if you agree to be part of my study. You will get a copy of this form to keep for yourself.

Signature of Participant _____ Date _____

Name of Participant _____

Signature of Investigator or Designee _____ Date _____

Syracuse University IRB Approved

JUL 23 2015

JUL 22 2016

APPENDIX B: INTERVIEW PROTOCOL

Interview Guide: Teacher Teams

1. Tell me about yourself as a teacher. (try to get at what their specialty is and where they went to school)
2. What experiences did you have with technology, as a pre-service teacher?
3. How have you used technology in your classroom or with your students?
 - a. Explain about the technology you use with your students.
 - b. How are you using technology to support needs of your students?
 - c. Why do you think that technology is beneficial?
4. How do iPads support students with low incidence disabilities in inclusive settings?
5. How do teachers' perceptions about technology affect technology use?
6. How are iPads best integrated into a classroom setting to assist students in learning?
 - a. How are iPads being used in your classroom?
7. What factors most influence iPad integration?
8. How do iPads, when used with students with low disabilities, help to open up access to the curriculum?

Interview Guide: Parent/Guardians

1. Tell me about the process of your child acquiring the use of an iPad for their needs in school.
2. How was your child included in the technology acquisition process?
3. How do iPads help your child in inclusive settings?
4. How do iPads, when used with students with low disabilities, help to open up access to the curriculum?
5. How have iPads helped your child succeed?
6. What would you do differently for your child in the integration of iPads for them?
7. What factors most influence iPad integration?
8. How do iPads, when used with students with low disabilities, help to open up access to the curriculum?

Interview Guide: Student Participants

1. What types of technology do you like to use in school?
2. How do these tools help you to succeed in learning?
3. How does your iPad match your needs?
4. What experiences have you had with iPads in the classroom?
5. How do iPads help you to access the curriculum?

APPENDIX C: IPAD USAGE TRACKING TOOL

Table 7

iPad Usage Tracking Tool

When iPad is being used	Who it is being used with	Activity associated	How iPad is being used	Duration	Goal being met
Gen Ed Classroom	Gen. Ed Teacher	Math ELA	Description-	<u>minutes</u>	Description-
Sp. Ed Classroom	Sp. Ed Teacher	Science			
Other- (specify)	OT	SS			
	PT	Social Skills			
	Speech	Living Skills			
	TA	Special- (specify)			
	Other (specify)				

Mike and the iPad Usage Tracking Tool

iPad usage in each of the schools varied depending on the activity that occurred. School One used the iPad most frequently. According to Mike’s IEP, he needed access to a computer or iPad in order to access the curriculum. Mike is a student with a visual impairment so he needs enlarged documents in order to succeed. Mike’s IEP listed assistive technology as an accommodation, calling for a screen magnifier, enlarged keyboard, enlarged software, and use on a classroom computer daily throughout school. The IEP stated that an iPad be used daily throughout the school day to access the

Promethean board (interactive whiteboard) and to complete written assignments. I observed him using the iPad to meet specific vision goals as stated in his IEP for 162 minutes out of the 229 minutes. While Mike was working on a project-based lesson with his entire class there had been no plans created for the use of the iPad.

Billy and the iPad Usage Tracking Tool

iPad usage in School Two was for 50 minutes out of the 305 minutes that I observed. School Two mainly had Billy working on reinforcing the skills that he was learning during content area. This was mainly for working on handwriting skills and reinforcing math skills. Billy had his own personal iPad that he kept in his desk for the duration of the school day. It was his responsibility to plug the iPad in when it needed to be charged. Every student in Billy's class also had their own iPad. For 10 minutes out of the 50 minutes that Billy used his iPad, he used it independently in resource room. The remaining 40 minutes that I saw Billy using his iPad, all other students in the classroom also were using their iPads. Billy's IEP did not call for the use of an assistive technology device. Therefore, the uses of this iPad during the school day were up to the discretion of the teacher.

Theresa and the iPad Usage Tracking Tool

In School Three, Theresa used the iPad 6 out of the 6 times that I observed. The one-to-one aide who worked with Theresa when she was on the iPad was cognizant about having Theresa not always using the iPad but also showing her knowledge through different ways. iPad usage at this school occurred 67 minutes out of the 205 minutes that I observed. Theresa's IEP listed access to a computer under assistive technology devices and/or services. It stated that she be provided access to a computer for visuals and to

access the curriculum at her independent level. The teachers at this school have chosen an iPad to accomplish this need because Theresa was very familiar with how to use an iPad due to her using it at home.

Ben and the iPad Usage Tracking Tool

iPad usage in School Four was minimal for the two observations that I observed. Out of the 60 minutes of observation time, only 3 minutes were associated with the use of the iPad. After prompting the teacher for more observation times, Mrs. Tindle expressed to me that I should observe in the speech room because that was where Ben used the iPad the most. She also expressed to me that during morning meeting time, when I was observing, they were encouraging Ben to vocalize more. I could not access the speech room in order to see the use of the iPad in there.

Table 8

iPad Usage Tracking Tool Results

When Used	With who	Activity	How	Duration (min.)	Goal
School 4: Gen Ed Class	1-1 aide	Math	Reinforce Academic Content (Number id)	3	Goal not known
School 3: Gen Ed Class	1-1 aide	Math	Reinforce academic content (measurement)	15	Math Goal
School 3: Resource Room	1-1 aide	SS, Communication	Reinforce academic content (explorers) Communication(Type responses)	5	Speech/ Language Goal
School 3: Resource Room	1-1 aide	Math	Reinforce Academic Content (add/subtract)	15	Math Goal
School 3: Resource Room	1-1 aide	Math	Reinforce Academic Content (money)	5	Math goal
School 3: Gen Ed Class	1-1 aide	Living skills	Scheduling	1	Speech/ language goal
School 3: Resource Room	1-1 aide	Living skills	Scheduling	1	Speech/ language goal
School 3: Resource Room	1-1 aide	For fun	Brain break-color by number	25	No goal
School 2: Gen Ed	Gen ed/sped	ELA	Reinforce Content (Practice handwriting)	20	Motor Skills Goal
School 2: Gen Ed	Gen ed/sped	Math	Reinforce Content (Practice measurement skills)	10	No goal
School 2: Gen Ed	Gen ed/sped	ELA	Reinforce Content (Practice handwriting)	10	Motor skills goal
School 2: Resource Room	Sped	Math	Reinforce Content (Place Value Skills)	10	No goal
School 1: Gen ed	Gen ed/sped	Math	To help with vision	30	Vision goal

School 1: Gen ed	Gen ed/sped	Math	To help with vision	40	Vision goal
School 1: Gen ed	Gen ed/sped	Math	To help with vision	40	Vision goal
School 1: Gen ed	Gen ed/sped	Math	To help with vision	42	Vision goal
School 1: Gen ed	Gen ed/sped	Blended learning class	To help with vision	10	Vision goal

School 1- iPad used 5/6 times for 162 minutes out of 229 minutes

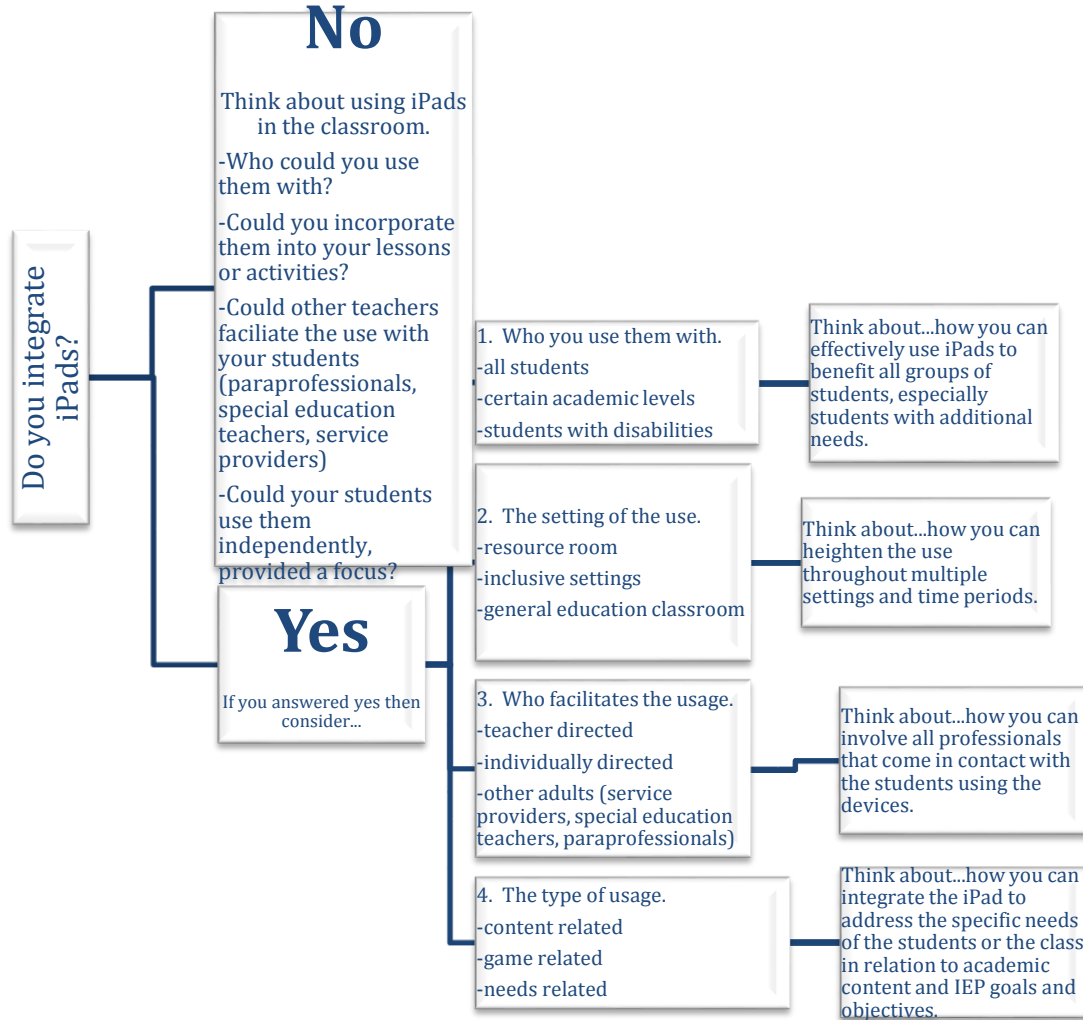
School 2- iPad used 4/7 times for 50 minutes out of 305 minutes

School 3- iPad used 6/6 times for 67 minutes out of 205 minutes

School 4- iPad used ½ times for only 3 out of the 60 minutes

APPENDIX D: REFLECTIVE INVENTORY

- Help with using iPads in teaching. <http://www.edudemic.com/the-ultimate-guide-to-using-ipads-in-the-classroom/>
- Help with getting everyone on board. <http://www.ipadbootcampforteachers.com/11-teaching.html>
- Help with addressing specific student needs through technology usage (includes vignettes) https://images.apple.com/education/docs/L419373A-US_L419373A_AppleTechDisabilities.pdf



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Yin, R. (1994). *Case Study Research: Design and Methods*. Sage Publications: California.

KATIE HEATH
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EDUCATION

- **Doctor of Philosophy**, Teaching and Curriculum
Syracuse University, Syracuse, NY, June 2018
Dissertation- Use and Integration of iPads with Students with Low Incidence Disabilities in Elementary Schools
- **Master of Science**, Literacy (Birth-6th Grade)
Keuka College, Keuka Park, NY, August 2011
- **Bachelor of Science**, Childhood Education and Special Education, *summa cum laude*
St. John Fisher College, Rochester, NY, May 2007

RESEARCH INTERESTS

- Special Education: Assistive Technology
- Education: Instructional technology, continuum of learning to practice, classroom practice
- Education: Pre-service technology integration programs

TEACHING INTERESTS

- Elementary Education: social studies education, mathematics education, literacy education, teacher education
- Special Education: inclusive education, assistive technology instruction

REFEREED PUBLICATIONS

- **Nichiporuk, K.** (2010). Bridging the Fluency Gap: A Manual of Activities and Strategies to Improve Student Fluency. *Keuka College Topics in Education Research Annual*, 15(30), 345-567.
- Ndethiu, S., Khatete, D., Masingila, J., & **Nichiporuk, K.** (2017). Kenyan secondary teachers' and principals' perspectives and strategies on teaching and learning with large classes. *Africa Education Review*.

NATIONAL PEER-REVIEWED PRESENTATIONS

- Ashby, C., Jung, E., **Nichiporuk, K.**, Vroman, K., & Woodfield, C. (Symposium Accepted). *Typing and talking back: Challenging Prevailing discourses of research with persons with complex communication needs*. Symposium accepted for 2015 American Educational Research Association Annual Meeting, Chicago, IL.
- Ashby, C., Jung, E., **Nichiporuk, K.**, Woodfield [Reutemann], C. & Vroman, K. (Paper Accepted). *iPad for communication: iPad app training for the development of independent typing*. Paper accepted for the 2014 TASH Conference, Washington, DC.

- Ashby, C., Dickens, B., **Heath [Nichiporuk], K.**, Vroman, K., & Woodfield, C. (November 2016). *Mapping communication support: Documentation of augmentative and alternative communication services in IEPs*. Paper accepted for the 2016 TASH Conference, St. Louis, Missouri.
- **Heath [Nichiporuk], K.** (November 2016). *Use and integration of iPads with students with low incidence disabilities in elementary schools*. TASH Talk accepted for the 2016 TASH Conference, St. Louis, Missouri.
- **Heath, K.** (November, 2017). *Use and integration of iPads with students with low incidence disabilities in elementary schools*. Presentation accepted for the 2017 NYSATE Conference, Saratoga Springs, New York.
- **Heath, K.** (December 2017). *My iPad story: The Stories of 4 individuals and their iPad usage in schools*. TASH Talk accepted for the 2017 TASH Conference, Atlanta, Georgia.

NATIONAL INVITED PRESENTATIONS

- Ashby, C., Jung, E., **Nichiporuk, K.**, Woodfield [Reutemann], C., Vroman, K., & Chadwick, M. (July 2014). *iPad for communication: A case study of iPad app training for the development of independent communication*. Presentation at the 2014 Summer Institute on Communication and Inclusion, Syracuse, NY.
- Ashby, C., Dickens, B., **Heath [Nichiporuk], K.**, Vroman, K., & Woodfield, C. (July 2016). *Mapping communication support: Documentation of augmentative and alternative communication services in IEPs*. Presentation at the 2016 Summer Institute on Communication and Inclusion, Columbia, MD.

SERVICE TO SCHOOL OF EDUCATION

- **Monroe 2 BOCES Professional Development Committee August 2017-Present**
- **Professional Development Presenter** January 2017-Present
 - Presentations to elementary school teachers and staff members on the RTI process and Universal Design for Learning
 - Creation of technology integration assignments and scope and sequence for undergraduate and graduate programs August 2016-Present
- **Research Assistant**
Institute on Communication and Inclusion, Syracuse University, Syracuse, NY
January 2014- Present
 - Currently developing training materials and engaging in research on autism, inclusion, and communication
 - Coded and analyzed video data of training study on skill development of individuals who type to communicate and were working towards physical independence
 - Volunteer staff for Institute on Communication and Inclusion 2016 conference
- **Research Assistant**
 - 'Cuse in Kenya Project, Syracuse University and Kenyatta University
Syracuse, NY and Nairobi, Kenya January 2014- June 2014

- Planned and conducted iPad trainings for teachers and students at private schools for the blind and visually impaired in Western and Eastern Kenya

UNIVERSITY TEACHING EXPERIENCE

Spring 2017 Assistant Instructor for Education, Undergraduate & Graduate Level
Roberts Wesleyan College, School of Education

- Foundations in Special Education (undergraduate & adult accelerated learning)
- Assessment in Special Education (undergraduate)
- Assessment in Inclusive Classrooms (graduate)
- Language Learning Disabilities (online graduate)
- Instructional and Adaptive Technology (graduate)
- Autism Workshop & DASA Workshop

Fall 2017 Assistant Instructor for Education, Undergraduate & Graduate Level
Roberts Wesleyan College, School of Education

- Foundations in Special Education (undergraduate & adult accelerated learning)
- Assessment in Special Education (undergraduate & adult accelerated learning)
- Applications for Prescriptive and Collaborative Teaching (online graduate)
- Autism Workshop & DASA Workshop

Spring 2017 Visiting Instructor for Education, Undergraduate & Graduate Level
Roberts Wesleyan College, School of Education

- Foundations in Special Education (undergraduate)
- Assessment in Special Education (undergraduate)
- Language and Literacy II (graduate)
- Instructional and Adaptive Technology (graduate)
- Language Learning Disabilities (online graduate)
- Autism Workshop

Fall 2016 Visiting Instructor for Education, Undergraduate & Graduate Level
Roberts Wesleyan College, School of Education

- Assessment in Special Education (undergraduate & adult accelerated learning)
- Applications for Prescriptive and Collaborative Teaching (online graduate)
- Nature and Acquisition of Literacy (graduate)

Spring 2016 Instructor for Safe and Healthy Learning Environments, Undergraduate & Graduate Level

Syracuse University, School of Education

- Fulfills the harassment, bullying, and discrimination prevention and intervention training required for certification and the Dignity for All Students Act

Fall 2015 Graduate Assistant for Safe and Healthy Learning Environments,
Undergraduate & Graduate Level

Syracuse University, School of Education

- Fulfills the harassment, bullying, and discrimination prevention and intervention training required for certification and the Dignity for All Students Act

Spring 2015 Graduate Assistant for Adapting Instruction for Diverse Student Needs,
Undergraduate & Graduate Level

Syracuse University, School of Education

- Exploration of Universal Design for Learning, differentiation, and other ways to support the academic, communication, behavioral, and social development of students in schools and classrooms

Fall 2014 Graduate Assistant for Adapting Instruction for Diverse Student Needs,
Undergraduate & Graduate Level

Syracuse University, School of Education

- Exploration of Universal Design for Learning, differentiation, and other ways to support the academic, communication, behavioral, and social development of students in schools and classrooms

Fall 2014 Instructor for Childhood Education Seminar, Graduate Level

Syracuse University, School of Education

- Class time used to connect field experiences to course work. Allowed for extension and elaboration of topics connected to the semester classwork and to specific field experiences.

Spring 2014 Instructor for Social Studies Methods, Undergraduate level
Syracuse University, School of Education

- Investigation of New York State and Common Core Social Studies Standards, collaboration, co-teaching methods, differing history perspectives, and controversial issues

Fall 2013 Instructor for Social Studies Methods, Undergraduate level
Syracuse University, School of Education

- Investigation of New York State and Common Core Social Studies Standards, collaboration, co-teaching methods, differing history perspectives, and controversial issues

Spring 2013 Graduate Assistant for Social Studies Methods, Undergraduate level
Syracuse University, School of Education

- Investigation of New York State and Common Core Social Studies Standards, collaboration, co-teaching methods, differing history perspectives, and controversial issues

Spring 2013 Student teacher supervisor, Undergraduate level
Syracuse University, School of Education

- Observations and feedback for students within the childhood education field

Fall 2012 Coordinator for pre-block practicum, Undergraduate level
Syracuse University, School of Education

- Coordination of visits and observations in inclusive preschool settings

Fall 2012 Graduate Assistant for Issues in Dis/ability, Graduate level
Syracuse University, School of Education

- Exploration of different types of disabilities and how they have been portrayed through history

TEACHING CERTIFICATIONS

- Future Professoriate Program, University Teaching, September 2014- 2016
 - Provides opportunities for graduate students to experience teaching roles related to faculty positions. Prepares graduate students for the range of responsibilities they will assume as future members of the professoriate and to effect a change in

faculty culture by fostering recognition of the importance of teaching as a dimension of graduate education.

- NYS Professional Certification, Literacy, B-6, September 2012
- NYS Professional Certification, Childhood Education, 1-6, September 2012
- NYS Professional Certification, Special Education, 1-6, September 2012

OTHER EXPERIENCE

4th Grade Inclusive Classroom Teacher, Tenured, Hammondsport Central School,
Hammondsport, NY, September 2007-July 2012

- Developed and implemented new curriculum based on utilizing Common Core State Standards
- Studied best technology practices and implemented Cloud-Based Learning within the classroom
- Developed and presented professional development programs based on technology advancements to colleagues
- Created individualized and differentiated lessons to cater to students' learning needs
- Tracking of IEP goals and testing accommodations for students
- Analyzed quarterly district and NYS data for purposes of improving instruction
- Collaborated with Special Education teacher to develop Math and ELA lessons
- Supervised and mentored student teachers as they put educational theories into practice

Capstone Project, Keuka College, Keuka Park, NY, June 2009-August 2011

- Conducted research evaluating best practices within the fluency field
- Formulated appropriate activities to enhance and improve fluency development
- Presented research results to educational professionals and the Board of Trustees of Keuka College

Substitute Teacher, Hammondsport Central School, Hammondsport, NY, April 2006-June 2007

- Substituted for grades 3, 4, and 6, as well as a one-on-one aide for a student with Downs Syndrome
- Applied behavior management techniques while teaching to each students' needs
- Implemented lessons from Scott Foresman's Reading Street and Mathematics, Harcourt Math, and Houghton and Mifflin's Science textbooks

Substitute Teacher, Derech HaTorah of Rochester, Rochester, NY, Spring 2007

- Substituted for Grades 1-6, Computer, Middle School Math and English
- Observed an environment providing a Torah education while following NYS Educational Standards

Substitute Teacher, Bath Central School, Bath, NY, Spring 2006

- Substituted for grades 4 through High School: Art, PE, 12-1-1, Chemistry

- Implemented different behavior management styles in Inclusive and Special Education settings

STUDENT TEACHING AND FIELDWORK EXPERIENCE

4th Grade Student Teacher, Klem Road South Elementary, Webster, NY, Fall 2006

- Taught in an Inclusive setting with classroom teacher, special education teacher, and one-on-one aide
- Designed lessons and units for social studies, ELA, science, and math aligned to NYS standards
- Attended meetings focusing on students with special needs
- Prepared students for the NYS ELA, math, and science state tests
- Attended professional development school based meetings that focused on the Habits of Heart and Mind

1st Grade Student Teacher, Rochester City School District, School #33, Rochester, NY, Fall 2006

- Facilitated classes with a special education teacher in an Inclusive setting
- Assumed all planning, instruction, and management responsibilities for the classroom
- Executed lessons in each subject area that utilized Open Court and Math Investigations Programs
- Incorporated differentiated teaching strategies to promote multiple intelligences
- Planned Readers and Writers Workshop lessons that addressed all student-grade-level groups

Fieldwork, Harris Hill Elementary School, Penfield, NY, Spring 2006

- Drafted Unit Plans and conducted lessons using the Understanding by Design program in a 4th grade classroom
- Wrote a Functional Behavior Assessment and a Case Study

Fieldwork, Rochester City School District: World of Inquiry School, Rochester, NY, Fall 2005

- Conducted lessons that promoted the America's Choice program in a 2nd grade classroom
- Drafted an Individualized Education Plan, Diagnostic Report, Individualized Assessment Plan

Fieldwork, Hammondsport Central School District, Hammondsport, NY, Fall 2004-Spring 2005

- Implemented behavior management techniques
- Conducted small-group content lessons

ADDITIONAL EXPERIENCE

Modified/JV Cheerleading Coach, Hammondsport Central School, Hammondsport, NY, 2007- 2012

- Formulated team cheers, sidelines, and dance routines
- Implemented fundraising programs
- Took part in local and regional cheerleading competitions

Secretary, Hammondsport Teacher's Association, Hammondsport Central School,
Hammondsport, NY 2008-2012

- Collaborated with administration on school policies
- Established and led committees promoting teacher advocacy
- Drafted and promoted district-wide guidelines, such as mentor programs and APPR observation techniques

NATIONAL AFFILIATION & CERTIFICATIONS

- NYSATE, 2017
- TASH, 2016, 2017
- NYSRA, 2016
- American Educational Research Association, 2014
- Concussion Management Certification, 2011
- AACCA Safety Certification, 2010-Present
- New York State Coaches Certification, 2010-Present
- Cheer Limited Judging Certification, 2008-Present
- AED/CPR Certification, 2007-Present
- Member of Kappa Delta Pi Educational Honor Society, 2007-Present
- Member and President of the Council for Exceptional Children, 2004-2007

ACHIEVEMENTS

- Awarded Barrie Fleegel Memorial Active Educator Grant, May 2010, May 2012
- Special Educator Award, St. John Fisher College, May 2007
- Certified teacher for the Project Learning Tree Curriculum, 2007
- Empire 8 President's List, St. John Fisher College, Fall 2003-2007
- Dean's List, St. John Fisher College, Fall 2003-Spring 2007
- Salutatorian Scholarship, Hammondsport Central School, 2003
- University of Rochester Humanitarian Scholarship, 2003