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The Use of One-To-One iPad Technology and its Impact on Students Receiving Special Education Services Work Completion and Grades

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THE USE OF ONE-TO-ONE IPAD TECHNOLOGY AND ITS IMPACT ON STUDENTS RECEIVING SPECIAL EDUCATION SERVICES WORK COMPLETION AND GRADES

By

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CHAPTER ONE

Introduction

Changes

This particular meeting in May, 2013 did not start the same as the other staff meetings. There had been rumors from other teachers and a proclamation from the principal that there was to be a big announcement at this meeting. Teachers had whispered and chatted among themselves the day before the meeting wondering what the announcement might be. Would it be staff reductions? Changes in administration? Or something else? As the ninety or so teachers entered the lecture hall to find their seats, the conversations that had been whispers before were now spoken out loud. The large boxes at the front of the room suggested that there was something to be distributed. The signs on the front indicated that the contents of those boxes were to be given out to those with last names A-H, I-R, and S-Z. Finally, with much speculation and anticipation, the meeting started and the announcement was made: all staff members were to be issued an iPad! There was more news. It was disclosed that starting in the fall all students in our high school would be issued an iPad to use at school and home as well. This announcement was the beginning of a very interesting journey into uncharted territory.

As the meeting progressed, the principal explained to us teachers that we were to take the iPads and use them, play with them, download apps, and explore. The district wanted us to

become familiar with the iPads and begin using them this upcoming fall in our classroom. How we chose to use the iPads in our classroom was up to us. For example, would we use it occasionally for students to look up things on the internet or would we convert our lessons into digital format and go paperless? Although this was exciting for me it was also very intimidating. One question had been answered-I knew that the big announcement was the shift to integrating technology into our classrooms. Now the real questions flooded in. How would I do this? No set parameters? No directives on which apps to use and how to use them in the classroom? How would students react to this extreme paradigm shift in school? Would it increase student engagement in the classroom as the district hoped? How would I use this to assist my students receiving special education services to be successful in the classroom? What impact would this have on the performance of my students receiving special education services?

Challenges

During opening week when teachers returned in the fall of 2013, we returned to our buildings with varying feelings. Some of the staff had apprehensions, while some had high hopes and expectations in terms of how iPads could be used in the classroom. There was definitely a nervous energy in the air. For many of us, those questions that had been asked in the spring were still hanging without answers. Teachers had been reviewing their lesson plans and modifying them to include projects such as adding different multi-genre projects where students would be able to use their iPads as a tool to expand their learning into new modalities. As a special education teacher, I used these tools in my classroom too, but I had deeper concerns that my students would struggle with the changes coming.

Some of these concerns were dealt with immediately because the school had set aside the first week back to teach students how to use their iPads and specific apps they would use in all of their classes. This process would be done hour by hour so whomever taught first hour would teach the students how to use Google Drive and the second hour teachers would show the students how to use the app Notability. As a staff, we were assured from the administration that taking the first week of school to teach the students how to use the technology would result in plenty of time for the students to learn it and practice with it so that by the second week, students would be comfortable enough to use it in the classroom on a daily basis. My expectation was that the students would all be excited and embrace the new technology in the classroom. After all are not today's teenagers tech-savvy and connected?

My assumptions about teenagers and technology were about to be tested. I discovered that although many of my students did indeed use technology, they generally used it for entertainment purposes outside of school and had not used it as a tool to engage in learning. The student who enthusiastically picks up an iPad to play the latest game may be the same student who struggles to learn a new note-taking app or to use the iPad as an organizational planner. Students who struggled to learn new processes were stymied by this switch from a traditional class using textbooks, paper and pencil to one that used iPads throughout.

The students also struggled with learning the new apps. They struggled learning the unfamiliar processes to turn in work digitally instead of just turning in paper copies. It did not help that there were no school wide standards on which apps to use. For example, one instructor

may have a student turn in their work through a shared folder on Google Drive while another may have students turn in assignments to Schoology.

Other challenges that surfaced included technology that enabled students to share their work. Sharing was a plus when it came to collaboration on projects but a significant minus if students chose to Airdrop their work to other students to turn in as their own assignment. This same technology that allowed students to communicate and work together on their schoolwork could also be a distraction. Texts, Instagram, Facebook, and iMessages could be seen on student screens throughout the classroom both when students were given in class time to work on assignments and when teachers were teaching and giving instructions. Students who struggled with lessons or did not care for the subject matter would completely disengage from the lecture and play games or watch videos or movies on their iPads instead.

Successes

Although there were challenges, there were successes as well. In many cases, the iPads were a very useful tool in the classroom. Depending on the apps that were used, students were able to take pictures with the integrated camera, make videos using iMovie, presentations in Keynote, collages using Pic Collage, and comic strips to create projects which demonstrated their learning. I encouraged students in my classes to use their iPads to create video advertisements for their second trimester final projects. My students who had developing writing skills were able to use the iPads to take picture of notes on the board. Students who were capable of taking notes were able to write notes and mark text in the app Notability. Notability allowed students to take notes or input .pdf files into it so that students could read, mark text, and complete assignments. Use of these apps seemed to increase engagement and

students seemed to take a greater interest in completing tasks and learning. Once the students completed their work, they could upload it to Schoology, Google or YouTube where their work could be saved without worries of lost or missing assignments. It was now possible to do calculations without bringing in a calculator or to look up definitions using the internet instead of a dictionary. The iPad could be used as an e-reader and books could be read in class and at home without carrying a heavy backpack back and forth.

There were additional successes with this initiative for students receiving special education services as well. Many of these students struggled in the area of organization. For example, students would have trouble organizing their assignments and keeping track of due dates. Having most if not all of their work stored on the iPad was tremendously helpful to both students and teachers when it came time to submit work. The occurrence of lost, ruined or forgotten homework was greatly diminished with iPad use. Students who struggled with fine motor skills and writing were now given the ability to either take a quick photo of the teacher's lecture notes or type all notes and assignments without having to go to the computer lab or check out a device from the media center. This added convenience as well as anonymity, since all students had an iPad no one student stood out from the class. One other use for the iPads that was helpful to my students was the Universal Access. When selected in the settings, it allowed students to have news articles and other items from the internet to be read out loud. This meant that students who have lower lexile levels had access to content that may normally be too difficult for them to read independently.

Summary

Has iPad use in my special education classroom increased student achievement, engagement, and work completion? After having these devices present in my classroom for the past year and a half, I have wondered if the positives outweigh the negatives. On one hand, the iPads at times were a distraction because students engaged in off task behavior that often led to missed instruction. The consequence was added time to class periods since assignment directions would have to be repeated due to student inattention. I also wondered how students who missed the initial directions were able to complete their classwork accurately if they did not ask me to repeat them. Sometimes, the iPads had been used for cheating and inappropriately sharing work that should not have been shared. Teachers, myself included, had to be extra diligent to make sure that students were turning in their own assignments and not an assignment or portions of an assignment completed by another. On the other hand, the iPads have been a tool that have allowed students quick access to the internet, and also gave them access to tools to create and take their learning to a higher level.

The past year and a half has shown that there are both positive and negative aspects to the one to one iPad initiative. Our district introduced iPads to increase student engagement in the classroom. It is an expensive initiative, and thus, important to reflect on what the actual outcomes have been including weighing the positives against the negatives of having iPads in the classroom. After a year of students having the one-to-one iPad usage in the classrooms, I pose the question: Does the use of technology in a school that has implemented a one-to-one iPad program have a positive impact on students with special needs in terms of improving their grades and work completion rates? Throughout this capstone, I will also reflect on the progress

of the last year and determine both what challenges exist in using iPads in the inclusion classroom with students receiving special education services as well as identifying specific apps or technological features that may improve my students' academic performance.

Remaining Chapters Overview

In this chapter, I have explained how the one-to-one iPad initiative was introduced at my school. The iPads were introduced to improve student achievement and engagement in the classroom. As such, I predict that iPad use has led to an increase in student engagement, as well as improved grades and organizational habits among my students. I have explained the origins of my research questions and why I think it is an important topic for the special education field. I also outlined what some of the successes and challenges have been.

To accomplish answering this question, I will review and discuss in Chapter 2 what others have found regarding both iPad, and tablet usage in the classroom, and the impact on students receiving special education services. In Chapter 3, I have detailed the methods of my research. I reassert my reasons for choosing to conduct a mixed-method research models. I will describe the setting and participants in order to give a clear understanding of this research. The results are reported in Chapter 4. I will present the data using graphs and will provide an interpretation of my results. Finally, in Chapter 5, I include the findings of my research and a summary of this entire paper as well as review what I have learned from this process. In concluding my capstone I will offer observations, conclusions and new questions for further research.

CHAPTER TWO

Literature Review

The framework of this study draws upon three interrelated topics: (a) tablet/iPad technology use in K-12 education, (b) the inclusion/resource model of special education and (c) student engagement. The first section provides a background of technology use in K-12 education and synthesizes the research on technology use to improve academic outcome and student engagement. The second section reviews special education practices with an emphasis on inclusion and general education classroom support settings. Finally, the third section establishes a definition of student engagement, and discusses how engagement relates to both academic achievement and student success. Particular attention is given to studies exploring the impact of technology use on student engagement, learning, and achievement for students with special needs in the secondary classroom.

Technology

Technology has been used in classrooms for over 200 years. One of the first technological innovations used to teach reading was patented in 1809 (Benjamin, 1988). Other innovations followed. In the 1950s, a psychologist, B.F. Skinner, patented a machine that required constructive responses after observing his daughter in a classroom where he noted that all students had to proceed at the same rate. (Benjamin, 1988). In the 1980s, personal computers began to make an appearance in many American K-

12 classrooms. Multimedia and other technologies have been used in the classroom to enhance student learning for decades. Teachers have used filmstrips, videos, diagrams, audio recordings and animations to increase understanding of complex information, and in some cases, to improve student engagement (Banister, 2010). The use of electronic devices and the increased access to multimedia are changing how students access information. Students are using technology in the classroom today more than ever before. In a 2009 survey of 300,000 K-12 students, questions were posed regarding the ways in which students were using digital resources in the classroom. According to the survey, 34 percent of high school students took their tests online. Seventy-nine percent of the students surveyed stated that they completed their writing assignments using a digital device. Sixty-six percent of the students created slideshows, web pages or videos while thirty-three percent said that they used online textbooks (Project Tomorrow, 2010). As technology costs continue to fall, it is expected that students will have more opportunities to use technology in classrooms.

Initially, the costs of new technology such as computers were high. As new developments have occurred, the costs have continued to decline. In 2010, Apple introduced the iPad tablet at a much lower cost than previous laptop computers. This reduction in price from the cost of a computer to a tablet device led to a rapid growth in school districts using tablets in a one-to-one model. Cutbacks in education funding have prompted many districts to invest in devices that are less expensive than personal computers, such as iPads and tablets (Bloesma, 2013; Hu, 2011). Since that time, devices such as tablets and iPads have made an appearance in classrooms in growing numbers. Districts have implemented this new

technology with the expectation that it will increase student learning and performance (Blow, 2012).

iPad utilization in the classroom has enabled students to have access to both the internet and other educational resources including programs or applications, called apps, that have educational value and use. Additional advantages to using these devices in the classroom include longer battery life, smaller and more portable size, relatively inexpensive cost, and the relative ease of learning how to use them. However, there are disadvantages and challenges of using iPads in the classroom too. Assignments and lessons can be lost with no way to restore them (Crichton, 2012). Another concern is that the ability to share work may lead to academically dishonest behaviors such as cheating (Crichton, 2012). Concerns have also been noted that iPads can be a distraction in the classroom. Students may choose to play games or use social media instead of schoolwork (Hoffman, 2013).

Despite their limitations, technological advances have opened up new possibilities for today's students. Access to the internet has given students the latest information on topics that they study in school (Crichton, 2013). This up-to-date information is much more timely than printed textbooks. As school districts have faced budget cuts they have been able to access this information to keep materials up-to-date when the purchase of new textbooks has been delayed (Kennedy, 2012).

In addition to having the latest information available, there are specific applications that have allowed students access to information that they would not normally be able to acquire. For example, some apps will allow students to have the text read to them. This feature allows students who have lower level reading skills to access information at a higher reading level than

they would normally be able to access by reading on their own. In addition, iPads could be used in many different locations and settings. Since these devices do not set students apart in the same way that previous assistive technology devices such as word processors have, students with special needs are more likely to blend in during class by using their iPads in the general population setting (Douglas, 2012).

Besides giving students, especially those with special needs, a way to do tasks they previously were unable to do, iPads have enabled the students to virtually experience places and things they would not otherwise have been able to experience. One example of this is in social studies classes where iPads were used by students to provide them with quality and animated pictorial images of topics they were studying. They also had access to the internet which allowed students to visit sites such as museums, historic locales, and events that they otherwise would not have seen. This internet access allowed students to research topics for papers and classroom projects about which they otherwise would not have been able to find current and accessible information (Cumming, 2013).

Although there are many advantages to having access to technology in the classroom, there are challenges that teachers must consider as well. In a whole class discussion, Hoffman (2013) asked students if iPads affected on-task behavior positively or negatively. Approximately half of the students said that the devices impacted on-task behavior positively, but when asked if iPads had a negative effect on on-task behavior, all of the students raised their hands. Students reported that having the apps and messaging capabilities impacted their off-task behavior at school and at home as well. Students reported that all of the various applications and programs available to them on their iPads led to distractions, and some stated

that these distractions may have resulted in lower academic performance (Hoffman, 2013). Teachers have also reported concerns about technology use in the classroom. A survey of over 38,000 educators reported that teachers had concerns about the increased ability to cheat and added distractions in a one-to-one model. The same study reported that teachers also had concerns on how to best integrate the technology within their lessons and instruction. Even though they had expressed concern, these same teachers recognized that the one-to-one model may have advantages in increasing student engagement allowing greater communication between students and teachers, as well as extending learning beyond the classroom (Project Tomorrow, 2010).

Another concern is that some students are not fully comfortable using these types of devices. Not all K-12 students embrace technology with excitement and anticipation. According to Project Tomorrow (2010), American sixth-grade students are generally more technology savvy than high school students. Forty-seven percent of sixth graders are using educational games in learning while only twenty-nine percent of their high school counterparts are doing so. In addition, more elementary students were found to enthusiastically use iPads, whereas high school students were slower to embrace the devices. One reason that younger students may be more comfortable with technology is that elementary students have been exposed to technology at the beginning of their school careers and it is familiar to them. In contrast, the high school students in the study continued to wanted access to their paper textbook that was more familiar. If the texts were available on iPads, the high school students were more likely to use these devices. Secondary students saw iPads as a resource for looking up items such as words in a dictionary or thesaurus, and iPads allowed them to look up these

items discreetly. Using an app was less public than using a hard copy dictionary and it provided a more immediate way of getting information (Crichton, 2012). A final concern that students expressed was a fear that they would break the iPads, which led them to express reluctance to use them on a regular basis (Bloemsa, 2013).

The Role of Technology in Special Education

The 1954 Brown v. Board of Education case resulted in equal access to education for all students (Obiakor et. al, 2012). Starting in 1975, the Education of All Handicapped Children Act mandated that students with disabilities receive a free and appropriate public education in the public schools (Hernandez, 2013). Since then, federal law, including the IDEIA (Individuals with Disabilities Education Improvement Act) passed in 2004, requires that students with disabilities receive their special education services in the least restrictive environment. The least restrictive environment (LRE) mandate states that students with special needs will be educated in "settings as close to the regular classroom as possible in which an appropriate program can be provided and the child can make satisfactory educational progress" (Hernandez 2013, p. 71).

IDEIA states that in general--to the maximum extent appropriate--children with disabilities, including children in public or private institutions or other care facilities, are educated with children who are not disabled, and special classes, separate schooling, or other removal of children with disabilities from the regular educational environment occurs only when the nature or severity of the disability of a child is such that education in regular classes with the use of supplementary aids and services cannot be achieved satisfactorily (U.S. Department of Education, 2004).

Since the enactment of IDEIA, students receiving special education services are increasingly learning in the general education classroom. This inclusion is a gain in civil rights, but it can mean that students receiving special education services may be taught by general education teachers who may not have the training and skill set to best teach them (Barrett, 2013). According to Obiakor et al, (2012), successful inclusion is based more on what happens (evidence based teaching methods used) than it is on the location where the teaching happens. In other words the critical elements of successful inclusion are the tools and methods used and not which classroom they are used in.

Assistive technologies often give the tools to students with special needs the edge they need to be successful in the general education classroom. As technology improves more programs are available to assist students with disabilities. Word prediction programs help students with difficulty in spelling to write. Video magnifiers allow students who are vision impaired to see classroom presentations. Programs exist that will read text aloud to students enabling the access of reading materials to students who can not read.

Parents and teachers of students receiving special education services are continuing to promote the use of the iPad as an assistive technology device. Assistive technology refers to "any item, piece of equipment or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of a child with a disability" (IDEIA, 2004). Parents appreciate the common technology used by all students as well as the number and types of applications that have the ability to assist students in the areas of communications, behavior, fine motor skills, and language acquisition (Cumming, 2013).

Common technology that is available for the iPad used as assistive technology can provide several advantages to students and teachers. One advantage is that teachers can take advantage of free tools and apps such as a free voice recording app like Audio Memos. Another advantage that common technology has over specialized assistive technology is that schools and families have access to retailers that carry items that they want. This makes it easier to locate and purchase what may be needed without having to locate a specialty retailer or wholesaler. Yet another benefit to using common assistive technologies is that a common set can address the problems associated with inappropriate use of tools. Students who may be inclined to go off-task and play games or check social media will be less likely to misuse the common technology for fear of having it taken away and appearing different than their peers who continue to use the common technology. (Bouck, 2012). Research by Rodriguez, Strnadova and Cumming (2014) notes that it is critical that both parents and teachers are satisfied with the educational use of iPads in order for the program to be successful. Parents' acceptance will allow students to have regular access to the iPad and allow their students to complete school - work at home. If students are using technology as assistive technology, it is also vital that the technology is available in both the home and school locale and that someone is available to assist them at each locale with that technology. That is, school to home communication is very important when implementing new educational or assistive technology.

The use of the iPad as an assistive technology device can extend to completing lessons and having curriculum designed using Universal Design for Learning (UDL). UDL consists of three principals in planning instruction. These are to provide multiple means of representation which means to present content in different ways to give students a variety of options for

acquiring knowledge and information; provide multiple means of action and expression to offer students a variety of ways to demonstrate what they know and to provide multiple means of engagement which will create a stimulating learning environment that offers different ways for a student to engage based on his or her preferences or needs (Barrett, 2013). The use of UDL assists students in learning because the abilities of learners vary due to individual brain structures and experiences, and a one size fits all delivery of lessons will not work for all students (McMahon, 2014).

The iPad has built in hardware and features that enable the teacher to use UDL principles in class. Hardware features include a built-in microphone and built-in speaker. The iPad also comes with an e-mail application, Safari (a web browser), iPhoto (a photo management tool), iTunes which allows the user to manage and listen to audio files, a maps program, a calendar and an e-reader (iBooks) are included (Murray & Olcese 2011). These built-in features allow the teacher to utilize more features of Universal Design for Learning in the classroom. An example of this is that test questions can be administered in an audio format, as well as a text format. Both the built in features and additional apps available enable students with special needs to access material in the general education classroom that they were not able to access previously (McMahon, 2014). The integration of iPad usage along with Universal Design for Learning enables students with special needs new access to materials in the general education classroom.

Student Performance

Many of today's students and teachers are technologically savvy and thus enjoy opportunities to use devices such as iPads in school. Certainly, the shared enthusiasm to use

iPads may increase student achievement and engagement. The term student engagement has come to refer to how involved or interested students appear to be in their learning and how connected they are to their classes, their institutions and to each other (Axelson & Flick, 2011). One of the key factors in student performance is the level of engagement in class. Willms, Friesen and Milton (2009) define student engagement as the way in which students value their education, feel a sense of belonging, participate in activities, and invest in learning. For centuries, the term student engagement has been used to understand interest or a lack of interest in class settings. In 1897, Dewey stressed the importance of student interest as a focal point in the student's education. In order for students to be engaged in their learning, they need to have interest in the content and see how it relates to their lives. Interestingly, over one hundred years after Dewey's report, increasing students' interest in learning and improving their engagement remain important topics in education.

Students receiving special education services may have additional needs to increase their interest and engagement in the classroom. Instructional and assistive technology options have helped teachers fill the gap between students' abilities and content and instructional objectives (Douglas, 2012). The question remains whether or not these options will continue to have a meaningful impact on student performance. In one study, secondary and elementary teachers in southern Illinois using iPads in their classrooms for at least one semester thought that the quality of tasks or assignments done by the students using iPads was higher quality than work that had been done before. The students used iPads to search for diverse sources of information on the internet and combined them to enhance their writing, but no overall difference in student achievement was noted (Vu, 2013).

When a small school district in the heart of Silicon Valley in Northern California implemented a rollout of iPads to teachers willing to use technology with their students, the students appeared to be quite excited, as they made short videos, took pictures, and used Google Maps online to look up their houses even before any additional apps were loaded on the iPads (Blow, 2012). The students were able to use the devices to find information that clearly connected to their outside interests and lives. Another way that iPads were successful in the classroom and impacted student performance was when iPads were used in a northern California school district by four students with language based disabilities in their English classes. The students using iPads shortened the time it took to read novels by half (Cumming, 2013). The researcher suggested that hearing text spoken aloud while reading it, as well as the ability to change the size, and type of font made this possible. The students were able to use the iPads to watch videos and movies of the novels they had read in class (Cumming, 2013). In addition to reading, student communication also appeared to have improved in that teachers reported that the iPads assisted students with speech impairments in communicating by using various speaking and diction applications. This has lead to less confusion and frustration between students and teachers due to potential miscommunication (Cumming, 2013).

Classroom management is another major concern for teachers to consider as they incorporate technology in their classrooms. Students in one study of ninth-grade honors English students at a public magnet STEM (science, technology, engineering and math) high school reported that their on-task behaviors were directly related to the type of assignment, the subject matter, whether or not they liked that particular subject, and the teacher's classroom management style (Hoffman, 2013). Certain applications or programs were specifically

mentioned as being used when engaged in off-task behavior such as web browsers, iMessage for sending instant messages, Twitter for posting personal updates, and Snap Chat for sharing pictures with drawings or text added, with their friends instantly. Students said that one of the reasons that iPads were frequently used for off-task behavior is because students viewed them as a social device before it was introduced into the classroom (Hoffman, 2013). In another case study examining the engagement levels of fourteen students using iPads in the classroom, students self-reported that they were more often off-task when their teachers gave them a routine task that they could have completed just as easily with a pencil and paper. Students were more likely to stay on-task if the assignment required the particular capacity of the iPad such as finding information on a website or using an app to create a presentation (Bloesma, 2013).

Classroom management is not only a concern for general education students. A small study conducted by O'Malley (2013) sought to discover the effects of using iPads in a class-wide academic intervention to increase students' task completion and basic math skills of seven students receiving services for Autism Spectrum Disorder (ASD) at a special education school for students with moderate to severe disabilities. The author found that iPads were an effective tool to enhance learning and independence as evidenced by fewer non-compliant behaviors and teacher prompts, but the results were mixed for math performance. Another study conducted at an urban high school in the midwest compared how well students with emotional disabilities performed on math problems and task engagement using either iPads or worksheets compared to students who did not have these disabilities (Hayden et al, 2012). The students performed faster and had more correct answers per minute using the iPads than they did with the worksheets. Students also indicated that they were more engaged using the iPads than they were

with the worksheets because the students could use the iPads to assist in looking up data (Hayden et al, 2012).

There are still many unanswered questions regarding the use of a one-to-one iPad model for students with special needs in the general education classroom, which may be due to the recent introduction of the iPad within the last five years and its usage in the classroom. Most research to date has focused on the use of iPads and tablets on the general education population as a whole. For instance, Project Tomorrow (2010) has a focus on all students K-12 and their use of technology in school, as do the studies by Bloemsma (2013) and Vu (2013). When the research does focus on students with special needs, the focus is on smaller groups or action research projects in an individual classroom.

There has not been much focus on students with disabilities use of one-to-one iPad technology in general education classrooms. The drop in the expense of technology has spurred more school districts in the nation to move to a one-to-one electronic device model with the hopes of increasing student learning and performance in the classroom. There has been improvement for students with special needs through the use of both hardware and software applications including word processing, calendar features, and video and audio capabilities. Students have greater access to materials and information compared to prior generations. Teachers continue to adapt lesson plans and differentiate their instruction using the concepts of Universal Design and integrate technology to make the assignments accessible to all of their students. These advances have enabled students receiving special education services to participate more in the general education classroom without having their specific disabilities detected. The question remains, however, on whether or not these improvements lead to an

increase in work completion and improvement of grades. In Chapter 3, I will overview this project's methods and procedures. A full description of the setting and the participants' demographics of the study will be provided.

CHAPTER THREE

Methodology

Introduction

Chapter two overviewed the introduction of various technologies in the classroom and its increased use in K-12 classrooms, the inclusion model of special education and student engagement. Even though more districts and schools are implementing technology in classrooms, especially iPads and tablet devices, what is unclear is whether or not using these devices improves student engagement and performance. Recent studies have reviewed student engagement and technology use in content-specific classrooms, at a specific school, or in sub-groups within a school. Existing studies have also analyzed how tablet and iPad technology can improve the performance of students with special needs as a sub-group or a specific class within a school. There is little information on how students with special needs perform as a group when one-to-one technology is introduced on a school wide scale to all students.

The question remains on what impact this technology has on these students engagement and work completion whose least restrictive environment (LRE) is within the general education classroom. The least restrictive environment is defined in the Individuals with Disabilities Education Act (IDEA) and in the Individuals with Disabilities Education Improvement Act (IDEIA).

The passage of these laws have increased the number of students receiving special education services in the general classroom and created the need to take a closer look at how various methods and curriculum as well as new technology in the classroom affect their academic achievement and engagement. It is important to understand the effects of this technology on the special education population in order to write appropriate lesson plans and be an effective teacher. In chapter three, I will discuss the methods I used to gather data to evaluate the impact of iPad technology on students with special needs to investigate the question: *Does the use of technology in a school that has implemented a one-to-one iPad program have a positive impact on students with special needs in terms of improving their grades and work completion rates?*

In order to investigate this question further, I collected quantitative data on work completion rates and final grades from students receiving special education services during the 2012-2013 school year, which is the school year before the implementation of the one-to-one iPad program. I then compared this data to the work completion rates and grades of the same sub-set of students after year one of the iPad implementation. Next, I compared the qualitative data to the quantitative data to see what themes emerged, if any, between the students' attitudes and beliefs, and their work completion rates and final grades.

Research Setting and Subjects

The following research took place in an upper-Midwest suburban high school for students in grades nine through twelve. For the 2013-2014 school year, 1,844 students were enrolled at this high school. The demographic makeup of the group was 77.5% White, 5.3% Asian, 8.1% Black, and 8.5% Hispanic. At this high school, 23.7% of the students qualified for either free or

reduced lunches, and 12.7% of the students received special education services (Minnesota Department of Education). The participants for this study were drawn from the special education population of the high school. Specifically, the inclusion criteria were students in a federal setting one or federal setting two level of service receiving at least half of their instruction in a general education classroom and who have work completion goals in their individual education plans (IEPs). Students receiving special education services at a federal setting one level spend 21% or less of their day receiving special education services with all other classes in the general education setting. Students receiving special education services in a federal setting two level receive special education services for 22% to no more than 60% of their day with all other class time in the general education setting.

Research Design and Methods

This study investigated special education students' perspectives of iPad use in a high school after the first year and a half of the implementation of a one-to-one program, which integrates the use of iPads across all content areas and its impact on grades and work completion rates. This study also investigated the following questions:

1. How frequently were iPads used in various classes?
2. How frequently were iPads used at home to assist in homework completion?
3. What iPad activities were considered most and least engaging?
4. How did the use of iPads affect student engagement?
5. What are some best practices and recommendations for effective use of iPads in the classroom for special education students?

An explanatory sequential mixed-methods approach was selected for this study to allow the opportunity to analyze empirical data and then to survey student perceptions to see if emerging themes were related to the addition of the iPads at this high schools. The survey asked the students questions regarding which classes they used the iPads in, which apps they used in their classes and whether or not having the iPads improved their engagement in their lessons. Creswell defines mixed method research as one in which the researcher collects and analyzes both qualitative and quantitative data and then mixes or integrates the two while framing the procedures within a philosophical worldview or theory (Creswell, 2014).

Before starting the research, I obtained informed consent from the students, and their parents when necessary. A signed consent letter allowed me to interview and survey the students to find common themes about the students' attitudes and insights about using the iPad in an academic setting. Once permission was received I analyzed the quantitative data collected through a quasi-experimental design. A quasi-experimental design is one in which the participants are not randomly assigned (Creswell, 2014), and this method was used in order to analyze the same group of students' data both before and after the introduction of the iPads. To gather the work completion data, I reviewed students' whose individual education plans (IEPs) included work completion goals and established baseline data on work completion percentages from the end of the 2012-2013 school year. I then compared this to the same students' work completion rates after the introduction of iPads at the end of each trimester during the 2013-2014 school year. Grade-related data were pulled from the end of year report cards for the 2012-2013 and 2013-2014 school years and for the end of the first trimester report card for the 2014-2015 school year. Since courses change from year to year in the secondary setting, I

compared subject matter grades from one year to the next. I compared math class grades to math class grades, social studies grades to social studies grades and English grades to English grades. Although the courses varied from year to year the student participants were the same throughout the study.

Qualitatively, the study followed a case study design. A case study is the investigation of a concern explored through a case within a particular setting (Creswell, 2014). This method was used because the issue of instructional design within a particular group of students in a specific school was studied. A case study is intended to understand an issue or problem through in-depth data collection and detailed analysis describing the data (Creswell, 2014). Gathering qualitative data permitted me to gain a detailed understanding of how special education students in a secondary school felt about using interactive technology and their perspectives of using this technology in the classroom. I interviewed the students about their work completion and study habits. I also surveyed students about their iPad usage and their perspective on iPad usage in class. Some of the limitations of self reported data from the student surveys include students feeling obligated to participate. They may have answered the survey questions in ways that they perceived as socially acceptable in order to impress their teachers. In order to mitigate these concerns, the permission form explained that participation was voluntary and that not participating would not affect the students' grades or their relationship with me.In order to protect the privacy of students the students were assigned a number and no survey data had personal identifying information on it. Students had the choice of taking the survey in a private room or taking it home in an unmarked envelope and returning it later.

After all the data was collected, I saw which relationships and themes existed between student attitudes and opinions on using the iPads in class, and the correlation, if any, to their work completion and final grades. The results highlight possible areas for improvement in using iPads in the classroom for special education students and suggestions for further research

CHAPTER FOUR

Results

Introduction and Review of Research Questions

The purpose of this study was to examine the impact on work completion and grades for students who receive special education services in general education classes in a high school that has implemented a one-to-one iPad program. It also investigated the students' perspectives and attitudes about using the iPad in class and how students used the iPad in the classroom and at their homes. This chapter will overview how the students' grades and rates of work completion were collected, and analyze these data to determine what effects the implementation of the one-to-one iPad initiative had on the students' grades and work completion.

Chapter Three explained the methods used to research the question: *Does the use of technology in a school that has implemented a one-to-one iPad program have a positive impact on students with special needs in terms of improving their grades and work completion rates?* This study employed an explanatory sequential approach to allow the opportunity to analyze empirical data on grades and work completion, and then surveyed students to see if there were any emerging themes or patterns in their academic achievement and work completion that were related to the addition of interactive

technology. The study first analyzed the quantitative data in a quasi-experimental design to analyze the same group of students' grades and work completion both before and after the introduction of the iPads. The work completion data were obtained by reviewing the students whose individual education plans (IEPs) included work completion goals. Baseline data points were established by reviewing work completion percentages from the end of the 2012-2013 school year, which was before the iPads were introduced in this setting. These data were compared to the same students' work completion rates after the introduction of the iPads during the 2013-2014 school year. Academic grades were pulled from the end of the year report cards for the 2012-2013 and 2013-2014 school years and for the end of the first trimester report card for the 2014-2015 school year. Since the structure of courses change from year to year in a secondary school setting, same-subject matter grades from one year to the next were compared. For instance, math class grades were compared to other math courses. While the courses varied from year to year, the student participants were the same throughout the study. Following the same group of students throughout the study gave the ability to watch the students adapt to the technology, and record any impacts that the iPads had on students' grades and work completion rates.

Originally, twenty-two students in their senior year of high school were asked to participate in the study. Of those twenty-two students, fifteen agreed to participate in the study and take the survey. All fifteen students are eighteen years old or older and attended the high school before the introduction of the one-to-one iPad initiative. All fifteen students received special education services, but took their core classes in a

general education setting. The study examined the students' grades before the implementation of the one-to-one iPad initiative and compared it to their grades after the implementation of the program. The study also examined the work completion rates of five students who had a work completion goal in their Individual Education Plans (IEPs) both before the implementation of the one-to-one iPad initiative, and after the initiative to see if there were any patterns of change among those students. In addition to the quantitative analysis of grades and students' work completion, this study examined students' perceptions of the one-to-one iPad initiative and the use of iPads in classes through the answers on a student survey.

The qualitative portion of the study, the survey, followed a case study design. The case study model was used because the issue of instructional design within a particular group of students in a specific school was studied. Gathering qualitative data through the survey assisted in gaining a detailed understanding of how students receiving special education services in a secondary school perceived the usefulness of interactive technology, and their perspectives regarding the use of such tools in the classroom. The students were questioned about their work completion and study habits as well as their iPad usage in class.

Impact on Student Grades

For this study, grades were compared in the following three subject areas: English, math and social studies. These subjects were chosen because they are required credits for graduation, and also, all students in this study would take these classes. The students' grades from the spring of 2013 before the iPad introduction were compared

with the grades in the same subject areas in the fall of 2013, the first trimester of iPad usage, and then with the grades in the spring of 2014 and fall 2015 after a full year of iPad use.

All fifteen students experienced some change in their grades after the introduction of the one-to-one iPad program. Three students had all their grades improve in English, math and social studies in the first trimester after the iPads were introduced. Three students had two grades improve and one stay the same. Of these students, all three saw improvement in their social studies grades, two saw improvement in English and one in math. While six students showed improvement in the majority of their classes, six students showed a decline in the majority of their classes. Three students had all of their grades drop in English, math and social studies in the first trimester after the iPads were introduced. Three students had two grades drop and one improve. Of these students, all three saw their math grades drop, two had declines in their English class grades and one student had a decline in social studies. Finally, three students had one grade go up, one grade decline and one grade remain unchanged. Two of these students had experienced an improvement in their English grade, and one showed improvement in social studies. Two students had a decline in their math grades, and one showed a decline in social studies. Grades stayed the same for each of the subject areas for one student.

It should be noted that other factors may have influenced these changes. Since these students were moving from the sophomore year to their junior year, their class schedules changed. For example, students who were taking algebra as sophomores were taking geometry as juniors. Students who were taking geometry were moving to Algebra

II. It should also be noted that students in this high school are on the trimester system. More specifically, each trimester, their schedule changed, and although they may have had the same course (geometry, for example) the teacher and hour of the day may have changed each trimester, which may have (briefly explain the possible cause-effect). Another possible explanation for the drop in grades after the introduction of the iPads is the fact that the iPads were introduced in the fall after the students had returned from summer break.

The students' grades continued to change as the school year progressed from fall 2013 to spring 2014. Three students demonstrated improvement in their grades in English, math and social studies from spring 2013, before the introduction of iPads, to spring 2014 the end of the first year of the one-to-one iPad initiative. Three students had their grades improve in English and social studies but all three students had their grades drop in mathematics. One student had two grades decline and one improve between spring 2014 and spring 2014. The student's grades dropped in English and math class. Three students had all three grades drop in English, math and social studies. Two students had one grade rise, one decline and one grade stayed the same. These two students had their grades improve in social studies, decline in math class and their English grade stayed the same.

In the spring of 2013 before the introduction of iPads, students' grades ranged from a high of A to a low grade of D in their English classes. The grades showed an overall decline in the first trimester after the introduction of the iPads. No students obtained a grade of A, and the number of students who received a B dropped throughout

the study period from five students at the beginning of the year in 2013, to one student at the beginning of the students' senior year in 2014. During the first trimester of iPad use, two students had a D in English class. The incidence of D grades grew throughout the year and in the fall of 2015 eight students were receiving a grade of D (see Figure 4.1).

A similar trend of declining grades can be seen in the students' grades in their mathematics classes. Two of the students had As in the spring of 2013, which declined to one student once the iPads were introduced. Mathematics students receiving As increased to two students or thirteen percent in the spring of 2014, but declined again to six percent or, one student, receiving a grade of A in the fall of 2015. Students who received B's also declined. Two students (13%) received a B grade before the iPads were introduced, which remained the same for fall 2014 when the iPads were introduced. However, these students' grades fell in the spring 2014 and fall 2015 trimester to only six percent, or one student, receiving a grade of B. Students receiving a grade of C increased for the first trimester after introduction of the iPads but declined in the subsequent trimesters, whereas students receive a grade of D initially dropped after the introduction of the iPad but increased in the subsequent trimesters. It should be noted that students are not required to take a math class once they complete math courses through Algebra II. The students who have met their math requirements and are no longer taking a math class were shown under the designation n/a (see Figure 4.2).

In the area of social studies, student grades seemed to rise overall throughout the course of a year once the iPads were introduced. Before the introduction of iPads, there were no students with a grade of A, and one student with a grade of B. In the first

trimester after the introduction of the iPads, there were two students with a grade of B and the number of C students stayed the same. There was one student who received a failing grade in the first trimester after the introduction of the iPads. Improvements can be seen during the spring 2014 trimester, since by this time, students had been using the iPads throughout the year. Four students, or twenty-seven percent, received a grade of A. There were three students, or 22% who received a grade of B, while five students, or 33% received a grade of C. Two students, or 13%, received a D and one student failed (see Figure 4.3). All students in this study had World History for their social studies class in tenth grade (Spring 2013) and U.S. History in eleventh grade. Senior students do not have a full year of social studies classes. The designation "n/a" indicates that the student did not have a social studies class that trimester.

Impact on Student Work Completion

One of the factors that influence a student's grade is work completion rate. If a student does not complete his or her assignments at all, or on time, it will generally have a negative effect on grades earned. This study examined student work completion rates for the five students in the study who had work completion goals in their Individual Education Plans (IEPs) both before the implementation of the one-to-one iPad initiative and after to see what impact, if any, having iPads would have on the students' work completion rates. Work completion rates were examined in the areas of English, math and social studies. The percentage of work completed was compared using data from before the implementation of the one-to-one iPad initiative to the same students' work completion rates after the introduction of the iPads to see what changes, if any, were

present. Not all students had work completion data on file for all trimesters reported on their progress reports for reasons including that progress was reported at a student's Individual Education Plan meeting and thus not recorded on that trimester's progress report, or that the student may have met his or her work completion goals or the goal for that subject and monitoring stopped.

The students' work completion rates in English classes initially dropped in the fall of 2013 after the introduction of the iPads, but then rose back to pre-iPad rates for two of the students. An additional two students had work completion rates in winter 2013 that were higher than they were before the introduction of the iPads. The initial decline may be due to the students learning how the iPad and apps worked when figuring out how to save and submit their assignments. Once the students adapted to using the iPads the rates of work completion in English classes rose. All of the students in the study had a work completion rate of 75% or higher in the spring 2014 trimester (see Figure 4.4).

A similar pattern can be seen with the work completion in the students' mathematics classes. There was an initial decline in work completion from spring 2013 to fall 2013 with the introduction of the iPads. Again, the work completion rates increased in the winter 2013 trimester, and stabilized in the spring 2014 trimester at the end of the year with all but one student completing 75% of the coursework (see Figure 4.5).

A very different pattern emerged for social studies. Similar to the trends in English and mathematics, there is a drop in work completion rates after the initial introduction of the iPads in the fall 2013 trimester. The work completion rates rise in the winter 2013 trimester, but declined again for two students in the spring (see Figure 4.6).

There does seem to be a pattern when examining work completion rates of these students both before and after the introduction of the iPads. Work completion rates declined in the first trimester that the iPads were introduced, but as students became acclimated to using them, their work completion rates rose. It is interesting to note that all students had improved work completion rates in English at the end of the first year with the iPads and two students had declining work completion rates in math and social studies at the end of the year. It should be noted that student 7, whose disability area is Other Health Disability (OHD) for Attention Deficit Disorder, was not taking her/his medication at the beginning of the 2013-2014 school year, and this may have impacted that student's work completion and grades.

Survey Results

In order to understand how the one-to-one iPad initiative impacted work completion and grades, I investigated the students' attitudes and opinions of using the iPads as well as how the students used the iPads in their classes. The students were asked questions through a survey regarding their attitudes and usage of the iPads in class and at home. Students were expected to bring the iPad to every class. In many classes, teachers would have a digital assignment that students would download to their iPad in order to complete it. Students were also expected to use the iPads to look up information online for in-class research. The iPads usage varied from class to class, in some cases taking the place of texts and other printed materials and in others used for more minimal tasks such as note taking.

The first part of the survey asked questions that established the demographics of the survey group. All of the students were seniors at the time they took the survey. Out of the fifteen students, five were female and ten were male. The students self reported that their grade point average ranged from lower than 1.4 to 3.5 on a scale of 4.0.

The students taking the survey had been using the iPads in the classroom for two years. The students were asked about their overall comfort level with technology. Most students, 87%, indicated that they were able to get by and rarely asked for assistance or were able to work independently and figure problems out on their own. The other students, 13%, still struggled with technology and stated that they often asked for assistance or were unable to figure it out even with instructions.

Use of Technology by Students

The students were asked how often they engaged in learning activities that involved the use of an iPad to solve real-world problems or issues. All students reported that they used iPads in classes to solve real-world problems or issues at least some of the time. The most frequent response of sometimes was reported by 67% of the students, while 13% of the students reported that they used iPads daily to solve real world problems and 20% stated that they seldom used iPads daily (see Table 4.3). Students were also asked how often they used iPads in the classroom and/or to study classroom content. Again, 67% of the students said that they did so sometimes, daily or multiple times per day (see Table 4.4). Student #13 answered never and is the same student who said that he was “unable to figure out technology even with instructions” in question

number four. Therefore, it is not surprising that this student chose not to use the iPad in the classroom and/or to study classroom content.

Students were asked in which classes do they use the iPads the most. The greatest use of the iPads occurred in language arts/English classes with 87% of students reporting that they used it in those classes. This use may be due to the fact that students used the iPads for research and writing assigned papers instead of using the computer labs as they had done in previous years. IPads were used the least in social studies class and electives with 40% of students reporting that they use their iPads in those classes (see Table 4.5).

All students used their iPads for research and inquiry. Most frequently students reported using it at least sometimes (see Table 4.6). Classes have diminished the amount of time spent at the media center and computer labs since the introduction of the iPads and students are expected to use those instead which may account for the students using the iPads for research and inquiry purposes.

Students also used their iPads for organizing and saving their assignments. Over half of the students, 53%, said that they used the iPad daily for organizing and saving assignments. Three students, or 20%, said that they used the iPad multiple times per day to save assignments. Only one student reported never using the iPad for organizing and saving assignments (see Table 4.7). Students were taught and expected to use the app Notability to take notes and organize those notes on the iPad. Only one student indicated never using the iPad to organize or save assignments. It is surprising to note that although students indicated that they used the iPads to save and organize assignments, most (60%)

said they seldom used or did not use the iPad for keeping a calendar or tracking homework due dates. The above may be due in part to the fact that no singular calendar or homework tracking app was taught to students and although it was suggested to students in their classes to track their homework due dates no actual formal program was set up to do so.

In addition to asking about tracking homework due dates, students were asked how often they used the iPad for taking notes in class.The majority of students (60%) said that they used the iPad daily or multiple times a day to take notes in class (see Table 4.10). It should be noted that only one student, student #13, answered "never" and is the same student that said he was "unable to figure out technology even with instructions" in question number four. Therefore, it is not surprising that this student chose not to use the iPad to take notes in class.

The next questions on the survey asked the students whether they were allowed to use their iPad in class and if the teacher promoted the ethical use of the iPads in class. Seventy-three percent indicated that they were allowed to use their iPad daily in class with twenty-seven percent stating that they were allowed to use the iPad in class sometimes (see Table 4.11). It is a policy and expectation at this high school that teachers integrate the use of iPads in their classrooms, so it is not unexpected that students are allowed to use their iPads in class. Students were then asked if their teachers promoted, monitored, and modeled the ethical use of iPads in their classrooms. The majority of students, 93%, answered that their teachers have promoted, monitored and modeled the ethical use of iPads in their classrooms at least on occasion. Only one student reported

that her/his teachers never promote, monitor or model the ethical use of iPads in the classroom (see Table 4.12).

Next, the students were asked about using the iPad in class to learn and spark their creativity. Over half of the students (73%) indicated that their teachers encouraged them to use their iPads while in the classroom to learn and to spark creativity. Four students (27%) said that they were seldom encouraged to use their iPads while in the classroom to learn and spark creativity (see Table 4.13). The next question asked the students if they used the iPad outside of the classroom to learn and spark their own creativity. Although over half the students indicated that their teacher encouraged them to use their iPads in the classroom to spark creativity and learn, the students use it less this way on their own at home. Nine students (60%) said that they used the iPad sometimes or almost daily to learn and spark their own creativity outside the classroom. Four students (27%) indicate that they never used the iPad at home to learn and spark their creativity (see Table 4.14). Students were asked how often they used the iPad to engage in collaborative problem-solving opportunities either inside or outside the classroom. Most students (73%) responded that they did use the iPad for collaborative problem solving at least sometimes with only one student (7%) indicating that he never used the iPad for that purpose (see Table 4.15). Students in this school were encouraged to use the iPad to engage in collaborative work. Students were able to share work in Google Docs for peer edits. They were also able to answer questions on the message board in Schoology, which allowed their classmates to see their answers. Social Media such as Twitter could be used in class to share ideas.

According to Cumming (2013), students' academic engagement increased with the initial introduction of the iPad. The survey asked students to rate how engaging learning was using the iPad in class. On a scale of one to five, with five being the most engaging, students answered how engaging learning is for them in school when their teachers have them use iPads. Six students (40%) indicate that using iPads at school makes it more engaging for them. Seven students (47%) indicated that their engagement level was about the same as before the introduction of iPads. One student (7%) said that using the iPad made school less engaging (see Table 4.16). In the next question on the survey, students were asked how interesting teacher provided activities using the iPads were in class. Again, students indicate that using the iPads makes learning more interesting. Eight (53%) of the students indicated that class activities using the iPads made learning more interesting to them. Six students (40%) felt that it was neither more or less interesting and one student (7%) said that class activities using the iPad made it less interesting for him (Table 4.17).

Students were asked to indicate their level of engagement in learning with the iPad versus their engagement in learning before the introduction of the iPad. Five students (33%) indicated that they were more engaged in learning when using the iPad than they were before the iPad. Two students (13%) said that they were less engaged. The majority of the students (47%) said that they were neither more nor less engage in learning when using the iPad than they were before using the iPad (see Table 4.18). Next, students were asked to indicate how engaged in class they feel when using iPads compared to doing other activities. This question received the same responses as the

previous question indicating that students' levels of engagement in learning were the same as their level of engagement when using the iPads compared to doing other activities (see Table 4.19).

The last couple of questions asked if the students thought the iPad helped them to learn more and if it helped them stay focused. Over half (53%) of the students indicated that the iPad had a neutral impact and that they learned the same whether or not they had an iPad. Only one student (7%) said that the iPad slowed learning. The rest of the students (40%) said that the iPad helped them to learn more (see Table 4.20). The students are split on whether or not using iPads in class is distracting to their learning. Six students (40%) indicated that it did not affect their learning while five students (33%) indicated that it helped them to stay focused. Almost an equal number of students, four (27%), indicated using an iPad in class distracted them (see Table 4.21).

The final question on the survey was an open-ended question that asked, "Is there anything specific you would like to tell about the impact of iPads on your education experience?" The comments ranged from positive to negative. On the positive side were comments such as Student 12 who stated, "It helped me pass classes I probably would not have passed without the iPad" and Student 1 who said that, "I lost a lot less work." Then, there were the comments that acknowledged that there were positive and negative sides to having the iPad. Student 11 said, "It was difficult to stay focused when first started using the iPad but throughout the years it has gotten easier." Student 15 stated, "I find it nice to have in the classroom. I like that I can follow along because I have glasses and it's not always easy to see, but I also like that if I miss school I can still be caught up. As for

being at home, I find doing homework a little more harder to focus. I find myself watching Netflix." Finally, there were a number of students whose comments indicated a more negative view of the iPads. Student 13 said, "It was a bad idea because of all the things technology does." Student 2 also seemed to think that the iPads were a negative when she said, "It depends on the type of person on if they will use the iPad well. Most students abuse the iPad."

Although the numbers in the survey indicate that students mostly see the use of the iPad as having either a neutral or positive affect on their grades and work completion, the comments indicated that they have some struggles with maintaining focus on schoolwork.

Interpretation

The results of this study showed some positive results when it comes to engagement and work completion for students who receive special education services in a general education classroom. Students indicated that they have used the iPads for research and inquiry, which has been true in other studies as well. Cumming (2013), indicated that students used iPads for access to the internet which allowed students to virtually visit sites such as museums and events and that this access allowed students to research topics for papers and projects about which they would otherwise not been able to access information.

Not all of the results were positive. Work completion rates improved, but there was a drop in grades in some classes as the study period progressed. Grades dropped in English and mathematics but improved for social studies that suggested that although

students stated that they thought the iPads helped them to learn, they may have overstated that effect. Hoffman's (2013) research similarly found that when students were asked if iPads affected on-task behavior positively or negatively, approximately half of the students said that the devices impacted on-task behavior positively, but when asked if the iPad had a negative effect on on-task behavior, all of the students raised their hands. The students said that having the apps and messaging capabilities impacted their off-task behavior at school and at home as well. Students reported that all of the various applications and programs available to them on their iPads led to distractions. Some students even stated that these distractions may have resulted in lower academic performance. Hoffman's findings are similar to this study's findings where students commented on having difficulty focusing on work or stating that most students abuse the iPad.

Another concern has been that some students do not like using iPads or similar types of technology. Student 13 in this study was definitely unhappy with the iPad initiative. He did not use it in classes and his survey answers indicated that his learning experience had been negatively impacted by the introduction of the iPads into the classroom. The student said that he had difficulty learning and using the various applications and that the iPad was a distraction that made it difficult to do work. Instead of using the iPad in class this student requested paper copies of assignments. This student's attitude is consistent with Crichton (2012) who found that not all students embrace technology with excitement and anticipation.

Summary

The research questions posed in this study can be addressed using the information gathered from grade and work completion data and the student survey data. Did the use of technology in a school that has implemented a one-to-one iPad program have a positive impact on students with special needs in terms of improving their grades and work completion rates? Work completion rates did decrease initially, but improved after the first trimester with the iPads. When considering the impact the iPad initiative have on student grades, in some subjects and for some students, using these devices appeared to positively impact grades, but there was no overall improvement for all students, or in some cases, an overall decline was observed in all student grades in all subject areas. The best results in terms of improvement in grades were in social studies. In English and math, the grades trended lower as time progress past the initial trimester with iPads, which could be attributed to a lack of student interest in the subject matter. Students reported that when they were not engaged in the lessons, they were more likely to use the iPad to play games or use social media.

More insight into the impact of iPads on student performance can be gained by reviewing the data from the student survey. Most students indicated that they were comfortable using the iPads in the classroom and were able to navigate through the programs with little to no assistance. Students used the iPads more frequently in their language arts classes, which seem reasonable since one primary use of the iPad was for note-taking and other writing activities. Students used the iPad less frequently in their

math classes and electives courses, which is understandable since the iPads would not be needed for hands-on electives like ceramics or wood working class.

Student engagement was more difficult to establish or measure. Students completed more work after the introduction of the iPads, but their grades did not improve overall. The students themselves reported that they felt as engaged or more engaged in the classroom since the iPads were introduced. A clue might be found in the comments from the final question on the survey where students indicated that they had some challenges in terms of maintaining focus with these devices. I suspect that it is possible that students were more engaged in activities while they were working on them, but felt the pull to disengage throughout class to check social media or play games and this interrupted engagement in the classroom activities/assignments and resulted in lower grades.

One final consideration is that the students who participated in this study all had Individual Education Plans and received special education services. They may have had greater difficulty learning new processes and applications than their general education peers. Depending on the student's disability he or she may have difficulty with processing speed, and learning new things may take extra time. Another possibility is that the student may have difficulty with understanding auditory directions and have difficulty following the teacher's oral instructions while looking at the iPad. It is important to consider that these results may differ from the experience of their general education peers who may not experience the same challenges. In discussions with colleagues who teach general education students it has been noted that the students receiving special education

services seem to have more difficulty with on-task behavior when compared to their general education peers. The iPad provides a distraction when lessons are difficult. It is tempting to students to play games or use social media when they don't want to do their assignments. Some students receiving special education services continue to struggle with organization and work completion even with the introduction of the iPad technology in school. These challenges are not limited to students receiving special education services but it seems upon observation that a greater percentage of these students have difficulty versus their general education peers.

CHAPTER FIVE

Conclusion

Overview of the Study

The results from the study presented in the last chapter centered on the following question: Did the use of one-to-one iPad technology have a positive impact on the work completion and the grades of secondary students with special needs? The study sought to find out what impact, if any, did starting a one-to-one iPad program have on students receiving special education services and had their classes in the general education setting. Did these students find it easier to organize and keep track of their assignments? Did these devices and applications improve students' engagement and increase their grades? What impact did the devices have on student participation in class? Were the students more easily distracted when they thought the assignments were boring or difficult? Chapter five will analyze the results and its implications for classroom teachers and administrators. A discussion of this study's limitations and problems will follow, along with ideas for improvements and any possible future research.

The study results were obtained after receiving written consent from the students. The data were analyzed by examining the students' grades and work completion from the last trimester before the introduction of iPads and then throughout the year after the

introduction of the iPads to assess what changes occurred in both work completion rates, and if there were any improvements in course grades. The data on work completion came from analyzing work completion goals for students who had these goals as part of their Individual Education Plans (IEPs). Out of the fifteen students who agreed to be part of the study, five had work completion goals. The baseline data consisting of percentage of work completed before the iPads were introduced was compared to the percentage of work completed after the introduction of the iPad initiative at each trimester during the 2013-2014 school year.

School grades were pulled from the year-end report cards for the 2012-2013 and 2013-2014 school years, and also for the end of the first trimester report card for the 2014-2015 school year. Since courses change from year to year in this secondary setting, subject matter grades were compared from one year to the next. Although the courses varied from year to year, the student participants were the same throughout the study, which allowed for appraising any changes in grades and work completion for the same participants.

In addition to examining quantitative data on work completion and students' grades, I also surveyed students using a twenty-three-item questionnaire on their technology and iPad usage in class to obtain a detailed understanding of how students receiving special education services felt about using interactive technology, as well as their perspectives of using this technology in the classroom. The students were also asked about their iPad use and their perspective on using these devices in class to see which

themes exist between student attitudes and opinions on using the iPads in class and if there was any correlation to their overall work completion and final grades.

Summary of Findings

The principal goal in this research study was to determine if the use of iPads would improve the work completion and grades of students receiving special education services in general education classrooms. The data showed that in the first trimester after the introduction of the iPads that the students' work completion rates overall dropped from the previous trimester's rate of work completion. However, after the first trimester with the iPads, the work completion rates rose, and three students had a higher work completion rate in English, one lower in English and one about the same. In math, only one student had a higher work completion rate. Two students' completion rates were lower in math and one about the same. Finally, in social studies classes, two students had a lower work completion rate, two students had a higher rate and one was about the same. This variability in completion rates may be explained by the differences in classes from trimester to trimester. Students may have different teachers each trimester for the same class throughout the year, and experience different levels of engagement in class due to changes in both the subjects topics and how they are taught.

The study also analyzed how the one-to-one iPad initiative affected the students' grades. In English classes, the scores initially had an increase in the number of students who had B and C grades. Two more students had a grade of B and three more students had a grade of C (figure 4.1), but the students' overall grade averages continued to decline through the end of the study period. The students' grades in math classes showed

a similar pattern to the English classes. At first, the number of students receiving grades of A and D dropped, and the number of students receiving a C went up. As the year progressed, however, the number of students receiving a grade of C dropped by two students and the number of students receiving a grade of D went up by four students by the Spring 2014 (figure 4.2). Social studies classes were a highlight where the students' grades went up (figure 4.3). There were no students that were getting an A in social studies before the iPads were introduced or in the first trimester after the iPad introduction, but by the third trimester with iPad usage, the students' grades had improved: four students received an A, three students a B and the number of students receiving a C fell from seven students to five students while the number of students receiving a D went from five students to two students. These variable findings are consistent with the research done by Vue (2013), where teachers thought that the quality of work done by students using the iPad was better than the work done before but no overall difference in student achievement was noted.

The survey results show that most students, or 87 percent, indicated that they were comfortable with the use of technology, and could solve issues on their own using their iPads and other technologies. Even though most students indicated that they were comfortable with the technology, students #2 and #13 still struggled, and said that they needed frequent assistance when using different applications or tools. Student #13 answered that he struggled with technology and that he did not use the iPad in the classroom or to study classroom materials, but did use it to look things up such as information for research. The above example is a concern that Crichton (2012) noted

when he said that high school students were generally slower to embrace the devices than were the elementary students. Moreover, the author found that when the high school students did use the iPads, the reason was most likely to use it as a resource for looking up items such as words in a dictionary or thesaurus.

The greatest use of the iPads occurred in Language Arts/English classes. Students in these classes frequently used the iPads for research and writing assigned papers instead of using the computer labs as they had done in previous years. All students used their iPads for research and inquiry. One interesting finding is that although students indicated that they used the iPads to save and organize assignments, most said they seldom used or did not use the iPad for keeping a calendar or tracking homework due dates. The above may be due to the fact that no singular calendar or homework tracking application was taught to students. Although many teachers suggested to students to use a calendar application to track their homework due dates, no actual formal program was set up to do so. The majority of students, or 69 percent, said that they used the iPad daily or multiple times a day to take notes in class.

As far as student engagement is concerned, most students indicated that the iPads either made school more engaging for them or that it did not have an effect. Six students indicated that using the iPads at school makes learning more engaging for them. Seven students indicated that their engagement level was about the same as before the introduction of iPads, and student #13 said that using the iPad made school less engaging. The above responses fit with the findings of Axelson and Fick (2011), who found that today's K-12 students are more technologically inclined compared to previous

generations, and overall, enjoyed the opportunities to use the iPads in school, and that this enthusiasm may increase student engagement.

The survey results also indicate that the students thought that iPads either helped them to learn more (six students) or that it had a neutral impact (eight students), and that they learned the same whether they had an iPad or not. Only student #13 said that the iPad inhibited his learning. Although the majority of the students indicated a neutral impact (53 percent), the majority of the students who said that there was an impact stated that the iPads impacted their learning in a positive manner. The students were split on whether or not using the iPads in class was distracting. Six students indicated that it did not affect their learning while five students indicated that it helped them stay focused. Four students indicated using an iPad in class distracted them. Although the numbers in the survey indicate that students mostly see the use of the iPad as having either a neutral or positive affect on their grades and work completion, the students did indicate that they have some struggles with maintaining focus on schoolwork. In the research done by Hoffman (2013) it was noted that students said their on-task behaviors were directly related to the type of assignment, the subject matter, whether or not they liked that particular subject and the teacher's classroom management style.

Implications

The results show some patterns. There was a drop in work completion rates in the first trimester that the iPads were introduced, which may have occurred due to the students' struggles to learn how to use the iPads and the various applications used in class. Work completion rates may also have been impacted by the students first

struggling to learn, through trial and error, to organize and manage assignments on the iPads. These challenges may have resulted from the fact that there was no school-wide standards for instructional or classroom management practices regarding the iPads. Teachers had their own systems and procedures for completing and turning in assignments. Students had to learn several different systems such as Schoology or Google Docs to comply with different class requirements. On this note, students' work completion rates improved during the second trimester after the iPads introduction by 25% which suggests that as students learned how to use the iPads, their work completion rates improved by an average of 25%. After the improvement from the first trimester, the results are not as clear. For example, some students continued to improve their work completion rates, some students had work completion rates that were similar to those before the iPad, and others had declines in work completion rates. The above findings are consistent with the survey responses in which some students indicated that the iPads help them stay organized and complete their work, while other students said that it had not had a great impact on how they learned.

Student grades were another area that was examined, and the results were mixed here as well. Again, there was an initial drop in the students' grades as there was in the work completion rates. The above trend suggests that the students took some time to adapt to the new technology. One interesting note is how the social studies grades improved with the use of the iPads, but in the other classes, the grades trended downward as the year progressed. There are a couple of possible reasons for the above trends. One potential reason is that in tenth grade before the introduction of the iPad initiative, the

students were taking World History, a class that most students, from what I understand, have little prior knowledge of the major topics, and moreover, the course covers vast amounts of material in one school year. When students move to their junior year, they take U. S. History. The students generally have more prior knowledge of this subject matter, since most are required to take a U.S. History class in middle school. Since the vocabulary is more familiar to the students and they are more likely to have prior knowledge on the subject, it is possible that this make the material easier to learn and improved academic performance. The iPad usage seems to have had little impact on the students' performance in social studies because of these variables.

Recommendations

The students in this study were receiving special education services, and had a variety of disabilities that impacted their performance in the general education classroom. The built-in features and additional apps available on the iPads are meant to enable students with special needs to access materials in the general education classroom that they were not able to access previously, such as having the iPad read out loud to the student. (McMahon, 2014). Due to the hurried nature of implementing the iPads in all classrooms, and the stress involved, teachers may have been just a step ahead of the students and not had enough time to properly learn the apps and functions before using them in the classroom. The students in this study were not given specialized instruction on how to use the iPad or the various applications in class, but rather, were given the same instructions and timeframes to learn the new processes as their peers from the general education setting. Schools considering a similar one-to-one iPad program should

consider giving students with special needs specialized instruction on using the iPads in their classes as well as giving them additional time to practice using the iPads and applications before using them in the general education setting. All students would further benefit from direct instruction in using some of the applications such as Safari (a web browser), iPhoto (a photo management tool), iTunes which allows the user to manage and listen to audio files, a maps program, a calendar and an e-reader (iBooks). The above applications can be used assistive technologies for students with special needs, but these uses were not taught within the general education setting. Several factors may explain why these apps were not taught within the general education setting. Teachers were not given training on how to use the iPad as assistive technology devices. If the teachers do not understand how the iPad device and apps can be used as assistive technology, they can not teach their students to use the iPads as such. Time was another barrier that prevented the direct instruction of applications that could be used as assistive technology. There was no time built into the schedule for this specialized instruction. Having the time to give direct instruction on how to use the iPads to read articles out loud for example will enhance the learning experience for students who struggle with reading. Direct instruction in these applications may reduce the initial decline in both work completion and grades that were observed in this study. It is important that teachers are given the training through professional development at the district and building level as well as time to learn the full capacity of these devices to be able to integrate it appropriately in their classrooms.

Another recommendation for teachers is to limit the access to games and social media in the classroom when using iPads. In the survey results, many students expressed concerns with staying on task and not playing games or watching Netflix movies when using their iPads in class. Removing the temptation to go off-task quickly and check a message or play a game will keep the students' focus on the task on hand and may improve learning and understanding. It is important to set up classroom expectations for the use of technology in the classroom early on. Teachers should use strategies to prevent students from using iPads inappropriately. One method is to require students to power down iPads and place them upside down on their desks or underneath their desks when they are not used in class. When students are working in small groups have each student responsible for a separate element of the assignment will help keep students on task. Applications such as Casper Focus where a classroom teacher can lock students into one application may assist in keeping students in the appropriate app during class.

Improvements and Possible Future Studies

There were several changes I would make if I were to do this study again. First, I would collect data for the students who were sophomores when the iPads were first introduced instead of just the students who were juniors. The above strategy would have doubled the student sample size, and perhaps showed more patterns in terms of actual work completion. By including sophomores, I would also be able to examine similarities and differences between the grades in the exact same courses such as English 10 instead of just looking at data for English classes in general. Another possible change would be to extend the time beyond the initial study period to a full two years after the iPads were

introduced. Extending the time would have provided a larger data set, which would enable me to detect other patterns that may not have emerged in the time frame of this present study.

One limitation of this study is that the responses and results were not broken down into disability categories due to the small sample size. There may be important differences in student engagement and grades between a student who has a Specific Learning Disability, one with Autism, and one who has a diagnosis of Attention Deficit Disorder. Future researchers may want to delve further into this topic to discover if there are any differences in work completion rates and grades for these various sub-groups to better address these students' specific learning needs. Another limitation of this study is the qualitative nature of the survey questions. The students in many cases had been in my classes in the past and in some cases may have provided answers that they thought would be best received. The students were surveyed at the end of their senior year. This may not provide an accurate reflection of the students' attitudes of technology and iPad use in the classroom from the previous year when they were introduced. It does, however, offer insight to the students' attitudes of iPad use after a full year. Future researcher may want to survey student attitudes throughout the timeframe of technology use and not just at the end.

This study has confirmed that all learners are individuals and have individual needs. The students who were able to successfully use the iPads in class to complete their homework showed an improvement in terms of their work completion rates and grades. However, those students whom had difficulty staying focused and who were distracted by

the iPads saw their grades decline. Many school districts have moved toward integrating iPad technology into their curriculla and have committed their financial resources in this technology to improve student engagement and performance. Because of this, it is important to identify those students who are struggling with using this technology early on and intervene with additional direct instruction as well as making the needed adjustments in the applications.

A review of literature also shows the importance of faculty and staff development. According to Barrett (2013), inclusion in the general education classroom should involve a collaborative teaching relationship that is flexible. Teachers who team teach together in a classroom should have adequate time to learn new techniques and discuss how to implement them in the classroom with the needs of diverse students in mind. Team teachers in English class can prepare lessons for a range of readers and students with disabilities. An example of this would be having an assigned text in English class prepared using iBooks in advance allowing students who may have dyslexia or who are visually impaired to have the text read aloud to them.

Time should also be allocated for general education and special education teachers to collaborate and align assignments and expectations.. Results of this study will be shared with my colleagues this fall 2015 during our Professional Learning Communities (PLC) meetings so that lesson planning can include how to better incorporate the iPad technology to support students with special needs. This information will be used to differentiate lessons in our team taught classes so that students with

special needs will receive the specialized instruction and additional time that they need to successfully complete their assignments and learn new material.

Appendix A

Participant Permission Letter

February 9, 2015 Dear ____,

I am a graduate student working on an advanced degree in education at Hamline University, St. Paul, Minnesota. As part of my graduate work, I plan to conduct research on the impact of the one-to-one iPad initiative at Park High School. The purpose of this letter is to request your participation. This research is public scholarship. The abstract and final product will be cataloged in Hamline's **Bush Library Digital Commons**, a searchable electronic repository and that it may be published or used in other ways.

The topic of my master's capstone (thesis) is how the use of the one-to-one iPad initiative impacts the work completion and grades of students receiving special education services in general education classes. I plan to survey students on their use of the iPad and compare it to their progress reports and final grades in English, math and social studies classes. This survey will be taken in a private setting at school or you may take it home and return it in the provided unmarked envelope. The survey will contain twenty-five questions to gather information about student use of iPads in the classroom and at home.

There is little to no risk if you choose to be surveyed. All results will be confidential and anonymous. Names will be changed for the district, schools, and participants.. The surveys will be conducted at a place and time that are convenient for you. The surveys will be destroyed after completion of my study.

Participation in the study is voluntary, and, at any time, you may decline to be surveyed or to have your survey content deleted from the capstone without negative consequences.

I have received approval from the School of Education at Hamline University and from our district office to conduct this study. The capstone will be catalogued cataloged in Hamline's **Bush Library Digital Commons**, a searchable electronic repository. My results might be included in an article in a professional journal or a session at a professional conference. In all cases, your identity and participation in this study will be confidential.

If you agree to participate, keep this page. Fill out the duplicate agreement to participate on page two and return it to me by mail or copy the form in an email to me no later than _____. If you have any questions, please contact me.

Sincerely,

Angela Brumbaugh 8040 80th St. Cottage Grove, MN 55016 (651)768-3789
abrumbau@sowashco.k12.mn.us

Rachel Endo, Capstone Faculty Adviser Hamline University School of Education 1536 Hewitt Avenue | MS-A1720 Office: Drew Hall/School of Education Room 196-A Saint Paul, MN 55104-1284

e-mail: rendo01@hamline.edu phone: 651/328-3067

Informed Consent to Participate in Qualitative Interview

Keep this full page for your records.

I have received the letter about your research study for which you will be interviewing science teachers and analyzing documents related to our district science assessment system. I understand that being interviewed poses little to no risk for me, that my identity will be protected, and that I may withdraw from the interview portion of the project at any time without negative consequences.

_____ Signature_____
Date

Informed Consent to Participate in Qualitative Interview *Return this portion to Angela Brumbaugh*

I have received the letter about your research study for which you will be interviewing science teachers and analyzing documents related to our district science assessment system. I understand that being interviewed poses little to no risk for me, that my identity will be protected, and that I may withdraw from the interview portion of the project at any time without negative consequences.

_____ Signature_____ Date

Appendix B

Student Survey

STUDENT SURVEY

The following survey contains information pertaining to student engagement through the use of iPad adoption within the classroom setting.

Demographic Questions

1. I primarily get the following grades on my report cards.

a. Mostly A's (4.0 or above GPA)

b. Some A's and some B's (3.5-3.9 GPA)

c. Some B's and some C's (2.5-3.4 GPA)

d. Some C's and some D's (1.5-2.4 GPA)

e. Worse than that (1.4 or lower GPA)

f. Do not really know

2. My current grade level is…

a. Junior

b. Senior

3. My overall comfort level with the iPad is…

a. I am unable to figure it out even with instructions.

b. I can use it but often ask for assistance.

c. I can get by and rarely ask for assistance.

d. I am able to work independently and can usually figure problems out on my own.

e. I am very proficient, so much so that others often seek my advice.

Use of iPad by Students

4. In my classes, I engage in learning activities that involve the use of an iPad to solve real-world problems or issues such as looking up definitions, maps or equations.

a. Never

b. Seldom

c. Sometimes

d. Daily

e. Multiple times per day

5. I use an iPad in the classroom and/or to study classroom content.

a. Never

b. Seldom

c. Sometimes

d. Daily

e. Multiple times per day

6. In which classes do you use iPads the most (mark all that apply)?

a. Language Arts/English

b. Mathematics

c. Social Studies

d. Science

e. Elective classes

f. Other-please list

7. I use the iPad for research purposes:

a. Never

b. Seldom

c. Sometimes

d. Daily

2. Multiple times per day

8. I use the iPad for organizing and saving my assignments:

a. Never

b. Seldom

c. Sometimes

d. Daily

2. Multiple times per day

9. I use the iPad for keeping a calendar and/or schedule of homework due dates:

a. Never

b. Seldom

c. Sometimes

d. Daily

2. Multiple times per day

10. I use the iPad for research purposes:

a. Never

b. Seldom

c. Sometimes

d. Daily

2. Multiple times per day

11. I use the iPad for taking notes in class:

a. Never

b. Seldom

c. Sometimes

d. Daily

e. Multiple times per day

12. In my classes, students are allowed to use their iPad.

a. Never (if so list which classes)

b. Seldom (list which classes you do use your iPad)

c. Sometimes (list which classes you do use your iPad)

2. Daily (list which classes you do use your iPad)

13. My teachers promote, monitor, and model the ethical use of iPads in their classrooms.

a. Never

b. Seldom (please list which teachers)

c. Sometimes (please list which teachers)

i. Daily (please list which teachers)

14. My teachers encourage me to use my iPad while in the classroom to learn and to spark my creativity.

a. Never

b. Seldom (please list which teachers)

c. Sometimes (please list which teachers)

d. Daily (please list which teachers)

15. I use my iPad outside the classroom to learn and to spark my own creativity.

a. Never

b. Seldom

c. Sometimes

d. Almost Daily

16. I use my iPad to engage in collaborative problem-solving opportunities either inside or outside the classroom.

a. Never

b. Seldom

c. Sometimes

i. Almost Daily

17. When my teachers have students use iPads at school, learning is _____ engaging for me.

1 2 3 4 5
Less More

18. When teachers provide class activities using the iPads, it makes learning _____ interesting to me.

1 2 3 4 5
Less More

19. I am _____ engaged in my learning when using the iPad than I was before the iPad.

1 2 3 4 5
Less More

20. I feel _____ engaged in class when using iPads when compared to doing other activities.

1 2 3 4 5
Less More

21. When it comes to learning, the following generally describes my experience with iPads in class?

a. The iPad helps me learn more
b. The iPad has a neutral impact; I learned the same whether I had an iPad or not.
c. The iPad slows my learning.

22. The use of iPads in class _____.

a. helps me stay focused.
b. does not affect my learning.

c. seems to distract me.

23. Which class did you find that you used the iPad the most?

24. Is there anything specific you would like to tell about the impact of iPads on your education experience?

Appendix C

Figures and Tables

Figure 4.1
Grades Received in English Classes

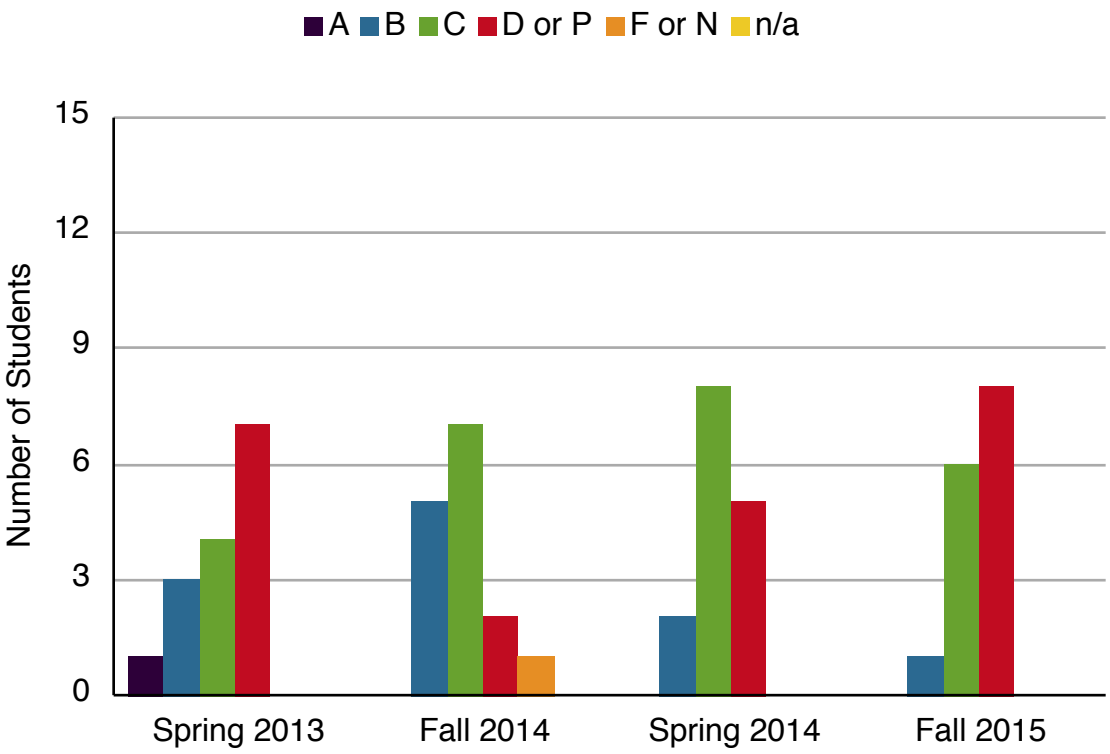


Figure 4.2
Grades Received in Math Classes

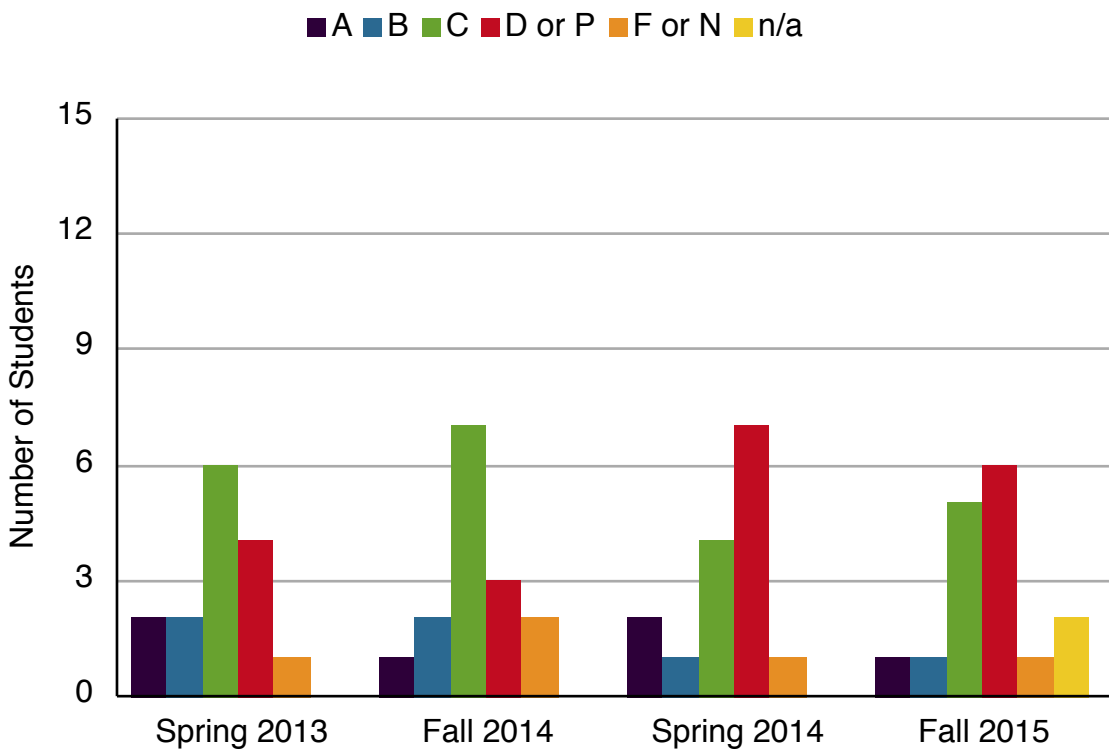

A
B
C
D or P
F or N
n/a
15
12
9
6
3
0
Number of Students
Spring 2013
Fall 2014
Spring 2014
Fall 2015

Figure 4.3
Grades Received in Social Studies Classes

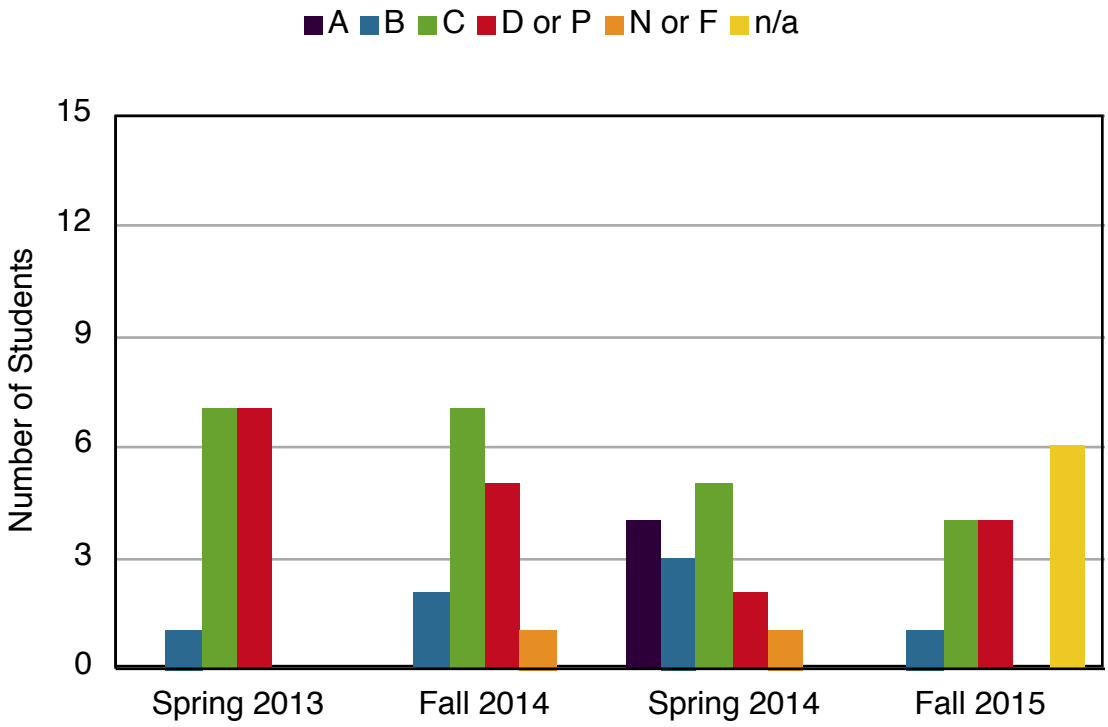


Figure 4.4
Percentage of Work Completed in English Classes

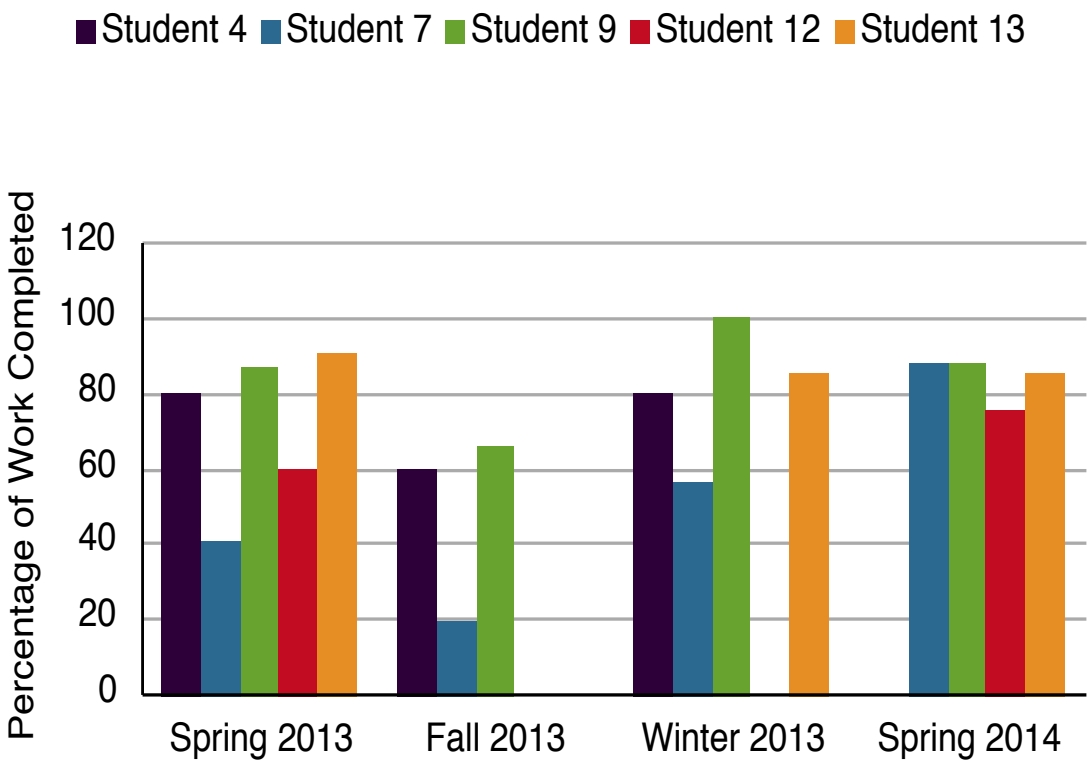


Figure 4.5
Percentage of Work Completed in Mathematics Classes

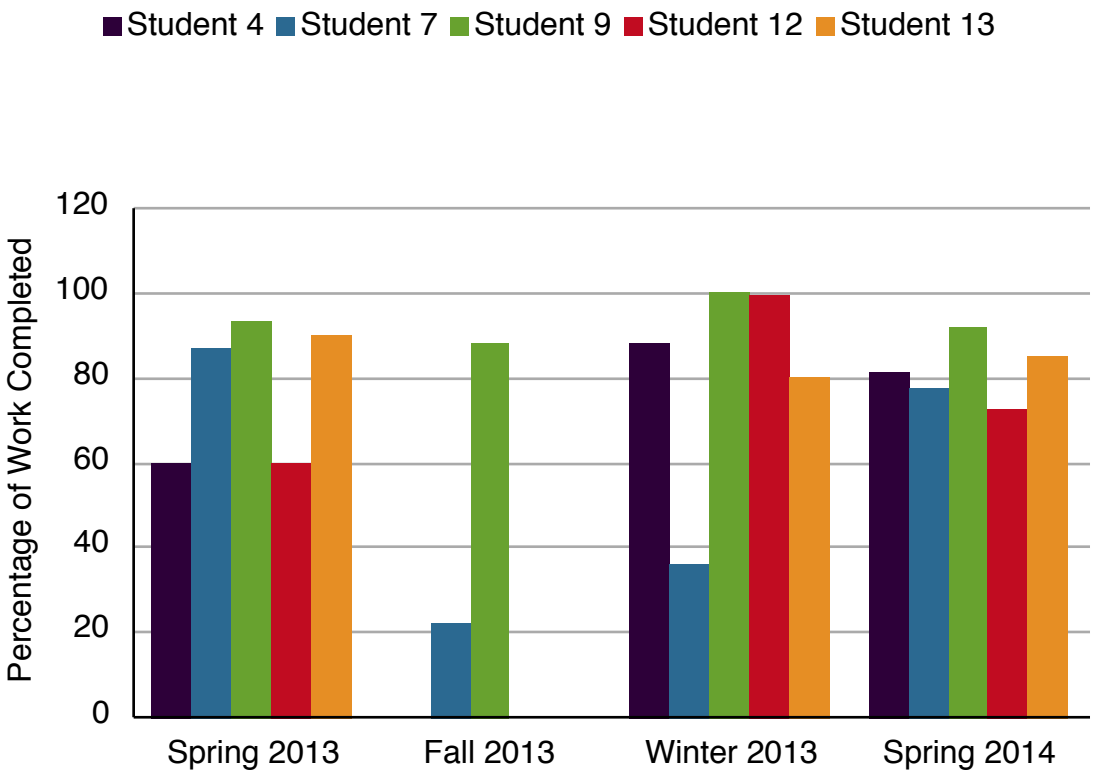
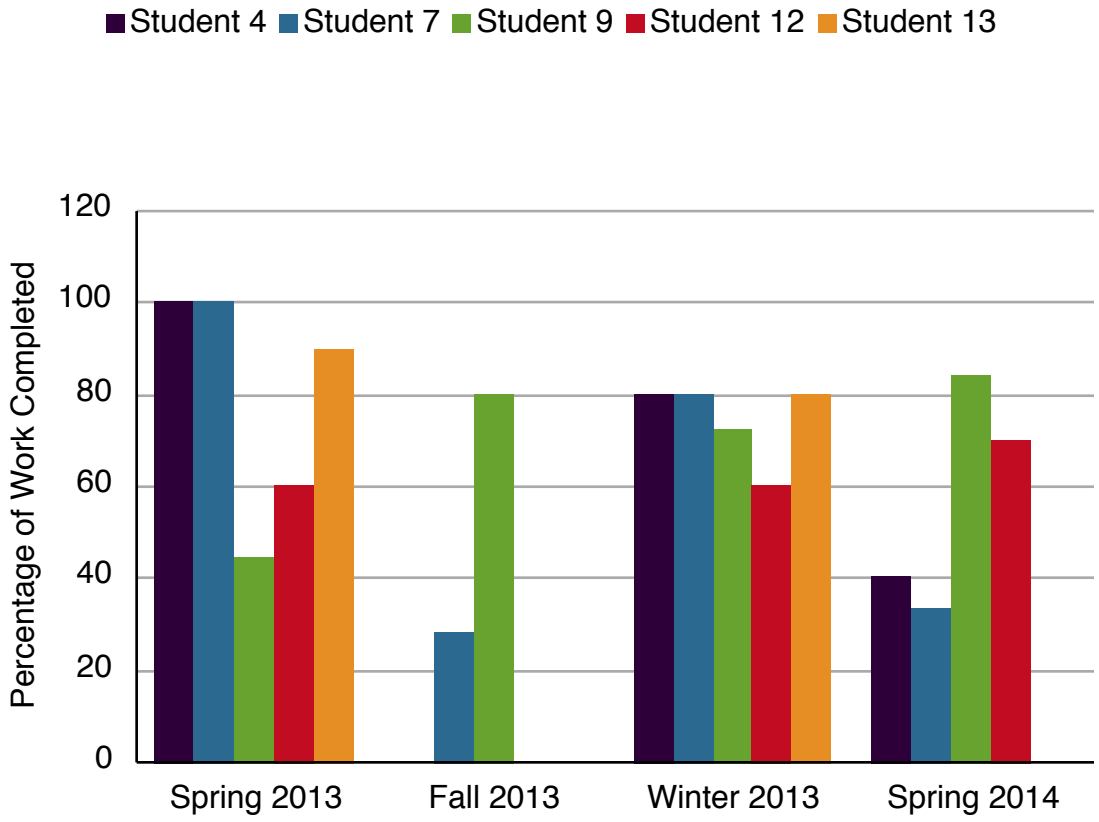


Figure 4.6
Percentage of Work Completed in Social Studies Classes



* Student 7 was off of medication for the beginning of the 2013-2014 school year. That student's disability area is Other Health Disability for Attention Deficit Disorder. This may have impacted that student's work completion and grades.

Demographic Questions

Table 4.1

Survey Results for Question 1: I primarily get the following grades on my report cards.

	# of students answering
a. Mostly A's (4.0 or above GPA)	0
b. Some A's and some B's (3.5-3.9 GPA)	2
c. Some B's and some C's (2.5-3.4 GPA)	5
d. Some C's and some D's (1.5-2.4 GPA)	4
3. Worse than that (1.4 or lower GPA)	1
3.Do not really know	3

Table 4.2
Survey Results for Question 4: My overall comfort level with technology is…

	# of students answering
a. I am unable to figure it out even with instructions.	1
b. I am okay, but often ask for assistance.	1
c. I can get by and rarely ask for assistance.	8
d. I am able to work independently and can usually figure problems out on my own.	3
e. I am very proficient, so much so that others often seek my advice.	2

Use of Technology by Students

Table 4.3
Survey Results for Question 5: In my classes, I engage in learning activities that involve the use of an iPad to solve real-world problems or issues.

	# of students answering
a. Never	0
b. Seldom	3
c. Sometimes	10
d. Daily	2
e. Multiple times per day	0

Table 4.4

Survey Results for Question 6: I use an iPad in the classroom and/or to study classroom content.

	# of students answering
a. Never	1
b. Seldom	1
c. Sometimes	6
d. Daily	5
e. Multiple times per day	2

Table 4.5

Survey Results for Question 7: In which classes do you use iPads the most (mark all that apply)?

	# of students answering
a. Language Arts/English	13
b. Mathematics	7
c. Social Studies	6
d. Science	8
e. Elective classes	6
f. Other	1

Table 4.6
Survey Results for Question 8: I use the iPad for research and inquiry purposes:

	# of students answering
a. Never	0
b. Seldom	1
c. Sometimes	7
d. Daily	4
e. Multiple times per day	2

Table 4.7
Survey Results for Question 9: I use the iPad for organizing and saving my assignments:

	# of students answering
a. Never	1
b. Seldom	0
c. Sometimes	3
d. Daily	8
e. Multiple times per day	3

Table 4.8

Survey Results for Question 10: I use the iPad for keeping a calendar and/or schedule of homework due dates:

	# of students answering
a. Never	5
b. Seldom	4
c. Sometimes	5
d. Daily	1
e. Multiple times per day	0

Table 4.9

Survey Results for Question 11: I use the iPad for research purposes:

	# of students answering
a. Never	0
b. Seldom	1
c. Sometimes	7
d. Daily	4
e. Multiple times per day	3

Table 4.10
Survey Results for Question 12: I use the iPad for taking notes in class:

	# of students answering
a. Never	1
b. Seldom	2
c. Sometimes	3
d. Daily	7
e. Multiple times per day	2

Table 4.11
Survey Results for Question 13: In my classes, students are allowed to use their iPad.

	# of students answering
a. Never	0
b. Seldom	0
c. Sometimes	4
d. Daily	11

Table 4.12
Survey Results for Question 14:. My teachers promote, monitor, and model the ethical use of iPads in their classrooms.

	# of students answering
a. Never	1
b. Seldom	3
c. Sometimes	6
d. Daily	5

Table 4.13

Survey Results for Question 15: My teachers encourage me to use my iPad while in the classroom to learn and to spark my creativity.

	# of students answering
a. Never	0
b. Seldom	4
c. Sometimes	7
d. Daily	4

Table 4.14

Survey Results for Question 16: I use my iPad outside the classroom to learn and to spark my own creativity.

	# of students answering
a. Never	4
b. Seldom	2
c. Sometimes	7
d. Almost Daily	2

Table 4.15

Survey Results for Question 17: I use my iPad to engage in collaborative problem-solving opportunities either inside or outside the classroom.

	# of students answering
a. Never	1
b. Seldom	2
c. Sometimes	8
d. Almost Daily	3

Table 4.16

Survey Results for Question 18: When my teachers have students use iPads at school, learning is _____ engaging for me.

	# of students answering
1-Less	1
2	0
3	7
4	5
5-More	1

Table 4.17

Survey Results for Question 19: When teachers provide class activities using the iPads, it makes learning _____ interesting to me.

	# of students answering
1-Less	1
2	0
3	6
4	5
5-More	3

Table 4.18

Survey Results for Question 20: I am _____ engaged in my learning when using the iPad than I was before the iPad.

	# of students answering
1-Less	1
2	2
3	7
4	4
5-More	1

Table 4.19

Survey Results for Question 21: I feel _____ engaged in class when using iPads when compared to doing other activities.

	# of students answering
1-Less	1
2	2
3	7
4	4
5-More	1

Table 4.20

Survey Results for Question 22: When it comes to learning, the following generally describes my experience with iPads in class?

	# of students answering
a. The iPad helps me learn more	6
b. The iPad has a neutral impact; I learned the same whether I had an iPad or not.	8
c. The iPad slows my learning.	1

Table 4.21

Survey Results for Question 23: The use of iPads in class _____.

	# of students answering
a. helps me stay focused	5
b. does not affect my learning	6
c. seems to distract me	4

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