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Exploring the Use of Technology to Support Literacy of Sixth Grade Students with Reading Disabilities

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Exploring the Use of Technology to Support Literacy of Sixth Grade Students with
Reading Disabilities

by

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University of Missouri-St. Louis
College of Education
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Curriculum and Instruction

Exploring the Use of Technology to Support Literacy of Sixth Grade Students with Reading Disabilities

Jaime R. Ball-Inman
Abstract

The degree to which the utilization of technology supports the academic achievement of sixth grade students with reading disabilities was examined using a quantitative research design. The data analysis involved the results from the Educational Technology Assessment Program to measure achievement. The Standardized Test for the Assessment of Reading (STAR) provided 2015-2016 scores regarding academic accomplishment of middle school students with reading disabilities. The central research question was developed based on the current literature on the impact technology can have on student academic achievement (Grinager, 2006). Using a specially designed survey, the researcher examined the teachers' understanding of educational technology and what technology was used to support learning in students with reading disabilities was determined. Along with the technology used by teachers, student reading scores, as well parent and student perception of technology use surveys were used to answer the research questions. In comparing data sources (STAR assessment and surveys), the degree to which technology supports student academic achievement was described.

Dedication

I dedicate this dissertation to my beautiful girls, Chloe and Brianna Inman and my amazing husband, Thomas Inman. Without the three of you, I never could have achieved this personal goal of mine. Chloe and Brianna, please remember that no one can take away your education, and I know you two can conquer the world with your continuous hard work and determination. Reach for the stars and dream big, girls. Regardless how hard a task might seem, you can do it. Tom, you have made me into such a strong, independent, confident, woman and continue to support me throughout my educational journeys. I truly could not have done this without you. I also want to dedicate this dissertation to my parents, Sgt. Jerry W. Ball, Sr. and Patricia A. Ball. Without your love, support, and prayers, I could not have made this journey. Thanks for showing me what hard work can do for a person. I am truly grateful to have two great role models in my life. My editor and friend, Pia Reinhold, I could not have done this without such an amazing editor, thank you for all your time. Finally, I want to thank my committee team, Dr. Wilkinson, Dr. Granger, Dr. Song, and Dr. Miller. What an amazing team. Each of you brought something really special to my doctoral journal, I will be forever grateful for your support and I only hope I make you proud in the future.

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CHAPTER ONE: INTRODUCTION

Background

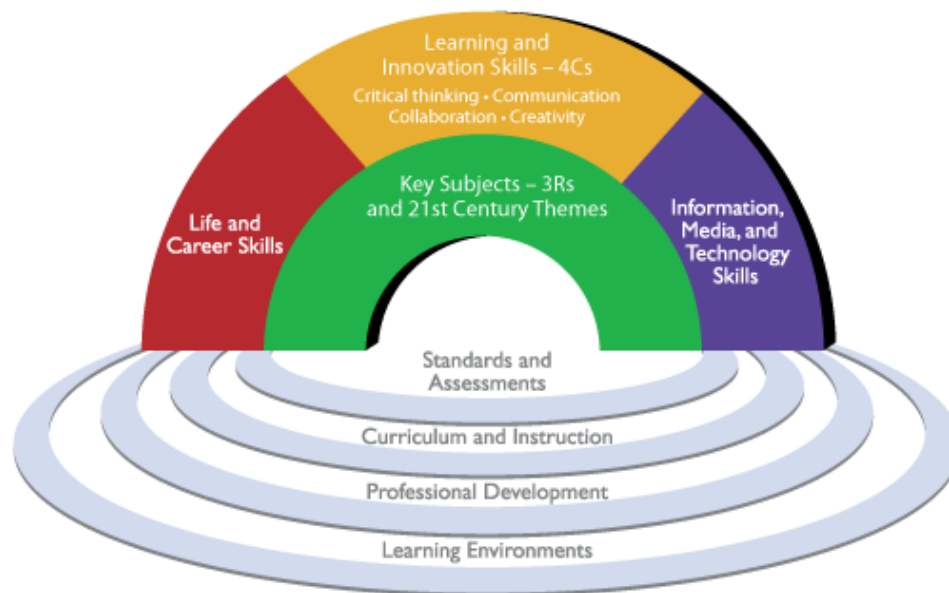
Technology is everywhere in today's society. It is available in every aspect of our lives, from communicating via cell phones and social media, to banking and mobile apps, even in healthcare and education. The list gets longer and longer as new technology advances appear in our lives. Most would say that technology has improved our lives, it has placed information at our fingertips such as directions on Google maps, finding a restaurant or a doctor and even paying bills through mobile apps. Most importantly, how does technology improve or support the education system? Does it support the needs of students with learning or reading disabilities? The purpose of this research is to describe the use of technology in helping students with reading disabilities. In this research, the researcher will be looking at the technology used by teachers and parents to help their students learn, such as multimedia, educational apps, tablets and Google Education.

Multimedia is a form of technology used in the classroom, using or involving several forms of communication or expression. Google Education offers Google Apps that are free to school districts and educators and uses completely online or cloud-based applications. According to Techopedia website, Google Apps is a brand of cloud computing, productivity and collaboration tools, software and products that were developed by Google. Cloud application is an application program that functions on the cloud (online), not on a user's device (Rouse, 2016). According to Google Education website, it offers a core suite of productivity applications that Google makes available to schools and educational institutions. These communication and collaboration apps include

Gmail, Calendar, Drive, Docs and classroom sites. Google Apps for Education account unlocks access to dozens of other collaborative tools supported by Google.

Technology has enhanced the lives of students in many ways, such as how they communicate, learn, work and relate to one another. As society changes, so do learning styles and as they evolve, education changes as well. Developing advanced technology in schools continues to take place in the 21st century classrooms, (Gagnon, Hughes, Maccini, 2002). But does technology support student learning? And how does the use of technology support higher achievement of middle school students with reading disabilities? According to research, there are new approaches to enhance students' reading skills through the use of technology-based practices. For example, computer or video-based multimedia program, technology-based assessments or audio texts, enhance students' reading skills (Gagnon, Hughes, Maccini, 2002). Guthrie and Davis (2003), have noticed a relationship between technology, curriculum and learning by using real world experiences and personal interaction to connect students to technology and reading. Students have the ability to link to online museums, digital databases, take a virtual tour all through the use of the Internet, making the connection through the use of technology. Technology in education provides students the opportunities for technology literacy, information literacy, the capacity for lifelong learning and prepares students for 21st century skills, (Gagnon, Hughes, Maccini, 2002). While there are numerous ways to define 21st century skills, for this study, the researcher will use the definition from the Partnership for 21st Century Skills framework (P21), focusing on the information, media, and technology portion. Figure below is an illustration of 21st century skills:

P21 Framework for 21st Century Learning
21st Century Student Outcomes and Support Systems



© 2007 Partnership for 21st Century Learning (P21)
www.P21.org/Framework

Figure 1: Partnership for 21st century skills

Partnership for 21st Century Skills (2007) was designed with recommendations from teachers, education experts and business leaders to create a support system to ensure students are prepared for their future in work, life and citizenship. This study will focus more on the information, media and technology skills when the researcher refers to 21st Century Skills. The P21 Framework focuses on four key subjects that are described as 21st Century Skills:

Life and Career Skills:

- Flexibility and Adaptability
- Initiative and Self-Direction
- Social and Cross-Cultural Skills
- Productivity and Accountability
- Leadership and Responsibility

Information, Media and Technology Skills:

- Information Literacy
- Media Literacy
- ICT (Information, Communication and Technology) Literacy

Learning and Innovation Skills:

- Creating and Innovation
- Critical Thinking and Problem Solving
- Communication
- Collaboration (P21 Partnership for 21st Century Learning Framework, 2007, p.1-2).

As Goon (2012) explains, John Dewey proposed a significant relationship between student achievement and the process of life skills (Dewey, 1916). According to Goon (2012), “John Dewey describes it’s the teacher’s obligation to mix the ingredients of studies and relevant life skills to make a significant contribution to the value of a student’s life,” (p. 1). John Dewey presented the theory of progressive education. Progressive education includes an emphasis on learning by incorporating hands-on projects, expeditionary learning, experiential learning, and collaborative and cooperative learning projects. Teachers can use these learning opportunities and relate them to technology projects, such as grouping students together in a research project on the Internet and assign the students a PowerPoint presentation.

Dewey conveys it's important to incorporate relevant life skills into the classroom. Students need educational experiences to help them feel empowered. Teachers can help students feel valued, equal and responsible members of the society, these are all critical life skills. Dewey’s idea is still relevant in today’s 21st Century Skills and educational technology, as teachers struggle to find ways to use educational technology to impact student academic achievement, (Goon, 2012).

Educational technology has logical connections with several theorists, such as Jean Piaget’s Constructivist Learning Theory. This theory focuses on knowledge and learning

(Fosent, 1996). “Piaget advocated that knowledge is a construction and not a reality, but an understanding, which is continuously being revised and reconstructed as a new experience” (Goon, 2012, p. 22). The Constructivist approach to learning engages learners. Like incorporating technology into the curriculum, students are exploring and personalizing the material during the learning process. Learning transforms into a more project-based instruction allowing learners to experience the world by doing things, rather than just receiving information by listening, according to Goon, (2012). Similar to Piaget’s work, students are using technology to build their academic understanding, using problem-solving skills and gaining 21st century technology skills.

Statement of the Problem

The purpose of this mixed methods research was to find out how the use of technology such as assistive technology, multimedia, educational apps, tablets and Google Education can impact student learning. Since advanced technology is part of our lives, most every student is quite engaged with technology, such as reading online books, Internet resources, using iPhones, iPads, tablets and playing digital games. Instructors progress into the 21st century, with the success of the technology that is brought into the classroom, with the hopes to increase student engagement in the classroom. Using technology as a tool for differentiation can also help engage students at a higher level of thinking. As with any change, there are challenges and practical questions that will develop, such as which technology will influence student’s achievement. As educators, we ask ourselves questions and possibly start to question our lessons, “Is this lesson more meaningful with the addition of technology?” Through this study, the researcher will investigate the use of technology

for students with reading disabilities and how learning with technology affects those students with reading disabilities.

Instructional technology is important in all grade levels of education. Technology is more than just hardware. The Association for Educational Communications and Technology (AECT) provides a 2008 definition of technology as “the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources” (AECT, 2008, p.1). According to Grinager (2006), educational technology includes the use of hardware, software and other digital technologies to higher level learning. In a K-12 and postsecondary education setting, the following types of technologies can be found in a classroom setting:

- Computers-Laptops, desktops, iPads, handheld devices
- Software-Instructional and digital software
- Online Content-Providing engaging interaction
- Interactive Whiteboards
- LCD Projectors
- Sound Enhancement-Speakers and microphones
- Televisions- Enhance Distance Learning
- Digital Cameras (Grinager, 2006, p.1).

Reading Disability

Learning to read can be taught at a young age, especially in grades 1-3. Teaching reading includes a developmental process involving letter and word recognition, decoding, comprehension and fluency. According to the Online Encyclopedia of Mental Disorders, a

reading disability is a learning disorder that involves significant impairment of reading accuracy, speed, or comprehension to the extent that the impairment interferes with academic achievement or activities of daily life. Students with reading disorder perform reading tasks well below the level one would expect on the basis of their general intelligence, educational opportunities, and physical health. “A common reading disorder is dyslexia. Dyslexia, however, usually includes deficits in spelling and writing as well as reading” (Online Encyclopedia of Mental Disorders, “Description,” para. 2). What happens when students fail to read? Educators begin to search for additional resources to include different instructional teaching methods or materials. It’s important for teachers to remember the shift to technology skills in today's changing society of learners as a part of of 21st century skills. Incorporating technology into a struggling reader’s curriculum may increase their academic achievement. Through the advancement of technology for students with learning needs, support from technology is becoming more common in our country's schools. Technology can be an efficient instrument that advances a student's contribution in the learning process and helps students with accessing and arranging information, (Maccini, Gagnon, Hughes, 2002).

Moats and Tolman (2009) found that students who are reading impaired might be the individuals who score underneath the 30th percentile in reading skills. Among every one of those poor readers, around 70-80 percent experience difficulty with word acknowledgment and comprehension. Another 10-15 percent of poor readers have all the earmarks of reading correctly, but are too slow in word recognition and text reading to score well on tests. Reading-disabled students have a particular weakness with the rate of word acknowledgment and responding to programmed review of word spellings, but may

do well on tests on phoneme awareness and other phonological aptitudes. These types of students' experience difficulty creating automatic acknowledgment of words by sight and tend to spell phonetically, yet not precisely. According to Moats & Tolman (2009), "They also have found that another 10-15 percent of battling readers seem to translate words better than they can comprehend the meanings of passages. These struggling readers are also recognized as dyslexic readers since they can read words accurately and rapidly and they can spell," (para 3). Students with dyslexia have reading issues that could be brought about by the different number of thinking, theoretical verbal thought or language comprehensions required for successful reading.

There are three types of reading disabilities that can overlap but can also be separate and distinct, such as phonological deficit, processing speed/orthographic processing deficit and comprehension deficit. Moats and Tolman (2009) defined "phonological deficit as implicating a core problem in the phonological processing system of oral language. Processing speed/orthographic handling deficiency influences speed and exactness of printed word acknowledgment and is known as a naming pace issue or familiarity issue" (para 3). However, comprehension deficit can be found in young students with social-phonetic inabilities, vocabulary weaknesses, dialect learning disarranges, learning challenges that influence conceptual thinking and logical thinking (Moats and Tolman, 2009).

According to LD Online (2016), students with reading disabilities may experience one or more of the following reading characteristics along with low comprehension:

- Reads slowly and deliberately
- Rereads lines in oral reading

- May substitute, omit, or transpose letters, words, syllables, and phrases
- Has trouble using basic phonics to sound out words
- Has decoding problems (difficulty with sound-symbol relationships and distinguishing between sounds and between certain letters)
- Loses place on page or skips lines, words and numbers
- Has poor comprehension of written materials
- Reads with an overdependence on guessing and compromises comprehension
- Does not like to read (Ruedel, Silver-Pacuilla, 2004, p. 5-6).

Purpose of Study

Computer technologies may improve reading skills for reading-disabled students. For this research, technology used in the classroom was explored, along with student's involvement with technology used as a tool for student achievement. This study examined students in sixth grade with reading disabilities and assessed the school's technologies that are incorporated to help support students with reading disabilities.

A common type of technology used for students with reading disabilities is assistive technology tools. Assistive technology tools are technology equipment or product software used to improve or modify the material for students with reading disabilities such as:

- Audiobooks (Books that can be electronically read to a student)
- Paper-Based computer pen (This technology records and links audio to what a person writes using the pen and special paper.)
- Computer software
- Online activities

- Speech synthesizers/screen readers (Stanberry, 2015).

According to Futuresource Consulting Ltd, half of K-12 students will have access to 1-to-1 ratio of computers to students for the school 2015-2016 school year (Molnar 2015). In the year 2006, just a decade ago, the classroom ratio of PCs to students was assessed at 1-to-4 (Wells and Lewis, 2006). Now in 2016, schools are finding ways to be a 1-to-1 ratio in the classroom. What this information indicates, is PC innovation can be utilized to give students extra practice in specialized skill areas (Clarifield & Stoner, 2005). A way to utilize Computer-Assisted Instruction (CAI) can be to differentiate and expand traditional face-to-face literacy instruction (Regan, Berkeley, Hughes, Kirby, 2014). As suggested, “a computer-assisted instruction can be used in several ways such as, instruct the difficult to teach at an individual pace, provide immediate feedback, provide instructive and consistent corrections, allow for extensive rehearsal or repetition, and be highly motivating” (Hall, Hughes & Filbert, 2000, p.175).

An example of computer-assisted instruction that can be used is Lexia SOS learning systems. “A reading program called Lexia Learning Systems Incorporated, created three reading software programs: Early Reading, Phonics Based Reading and SOS” (Reagan, Berkley, Hughes, & Regan, 2014, p.107). All three programs utilize the same pedagogical standards, yet they shift in ability and visual representation to coordinate the development of the learner. The program activities are highly interactive and organized in a grouping of skills going from phonological awareness (refers to an individual’s awareness of the phonological structure, or sound structure of words) to the control of morphological awareness (the recognition, understanding, and use of word parts that carry significance). A student's progress is tracked that allows students to advance once their targeted skills are mastered.

Research Question

Based on the current literature review on the impact technology can have on student academic achievements, the study was motivated by the following research questions:

1. In what way does the use of technology support the academic achievement of sixth grade students with reading disabilities?
2. What educational technology do teachers use in the classroom?
3. What educational technology support do students have at home to help overcome their reading disabilities?

Significance of the Study

In this study a mixed methods approach with a descriptive research design was used. The data analysis took place using the most recent reading test data from the school district's Educational Technology Assessment. The data provided a collection of current data surrounding academic achievement for sixth grade students with reading disabilities. A survey was given to classroom teachers, parents and students about specific technology they use in the classroom and at home. This study will be significant to education specialists, because it looked at three key components of educational technology: a teacher's comfort level with the use of technology, the teacher's beliefs about the effectiveness of educational technology on teaching and learning, and the relationship to student's academic achievements.

Limitations of the Study

This research study took place in a suburban school district K-12 public schools, specifically focusing on one middle school within the district. A survey instrument was created by the researcher. The researcher surveyed teachers, parents and students for this study. The researcher examined data regarding the district's educational technology data for academic achievement of students with reading disabilities. The limitations that this study encountered was getting enough parents and students participate in the surveys. The researcher limited the surveys to one middle school of the six total middle schools in the district. If the researcher expanded the surveys to other middle schools within the district, it is possible more parents would have participated in the survey. The researcher selected this middle school in particular because it is a 1-to-1 Chromebook environment.

Delimitations

This research took place at one middle school within St. Louis County, from September 2016 through November 2016 at the school district. The examination focused on the utilization of technology supporting student academic achievement with sixth grade students who have reading disabilities. This mix methods study used three surveys that were taken by teachers, students and parents. The researcher also reviewed student's reading scores and used a descriptive analysis to describe what technology is used in this school to help support student's learning needs. The researcher observed one sixth grade lower-level language arts class, which allowed the researcher to see what technology is used in this building. Students with reading disabilities were asked to participate in the study. The criteria of the students are described further in Chapter three.

Theoretical Perspectives and Conceptual Framework

According to Gee (2000), literacy can be defined as a set of skills obtained through a combination of learning, social interactions, and meaningful acquisition in natural settings. Joann Larson and Jackie Marsh's book, *Making Literacy Real, theories and practices for learning and teaching*, reflects on theoretical models of literacy with less emphasis on individuals. Instead, Larson and Marsh focus on literacy as a social practice and knowledge on how literacy is socially constructed (Larson and Marsh, 2005). Students are learning literacy everyday by communicating with family members, teachers and peers, as a social practice. Besides building confidence in students, literacy can include writing, reading and comprehension. Technology can be used in many ways one way is to incorporate social interaction. Lev Vygotsky (1962), a Russian teacher and psychologist, first stated that students learn through interaction and through communication with others. Vygotsky examined how our social environments might influence our learning process (Kozulin, 2003). Education has shifted from a traditional direct instruction approach to a more modern approach through the use of technology (Schenk, 2010). Students have become a group of socially active learners, engaging with a variety of technology tools and apps in order to enhance their learning skills (Schenk, 2010).

Educational technology has logical connections with several theorists, such as Jean Piaget's Constructivist Learning Theory. The Constructivist Learning Theory of Jean Piaget is a theory of knowledge and learning (Fosnet, 1996). The Constructivist approach to learning engages learners, just as incorporating technology into the curriculum, where students are exploring and personalizing the material during the learning process. Learning transforms into project-based instruction to allow learners to experience the world by doing

things, rather than just receiving information by listening according to Goon, (2012). Just like the work of Piaget, students are using technology to build their academic understanding, using problem-solving skills and gaining 21st Century technology skills.

Summary

This dissertation is organized into five chapters. Chapter one introduces the problem that was investigated and the background for this study followed by the statement of the problem, purpose of the study, research questions, importance of the study, limitations of study, delimitations and definitions of terms used for this study. The purpose of this quantitative research was to find out if the use of technology can support higher-level learning. Chapter two contains a literature review related to the research on educational technology as a tool to support student's academic achievement. Education technology should not focus on how many computers are in the classroom, but rather how all technologies are used in the classroom. Chapter three includes the methodology, reason for the quantitative study gathering of data, instruments used and discussion about validity and reliability of the data collected. Chapter four reports the data gathered and analysis of the findings. Finally, Chapter five summarizes the data and findings, with a conclusion of the study and recommendations for future research.

Definitions of Terms

This section contains definitions of terms used within the dissertation to create understanding of this study.

The 21st century skills: are a set of abilities that students need to develop in order to succeed in the information age.

Assistive technology: devices can include a piece of equipment or product system used to improve or modify students reading.

Dyslexia: includes deficits in spelling and writing as well as reading.

Comprehension deficit: often coinciding with the first two types of problems, but specifically found in children with social-linguistic disabilities, vocabulary weakness, language learning disorders, and learning difficulties that affect reasoning and logical thinking.

Computer-assisted instruction: an interactive instructional technique whereby a computer is used to present the instructional material and monitor the learning that takes place.

Constructivist Learning Theory: the knowledge is constructed and not a reality, but an understanding of which is continuously being revised and reconstructed as a new experience.

Digital learning: any instructional practice that effectively uses technology to strengthen a student's learning experience.

Educational technology: refers to the use of incorporating hardware, software and other digital technologies into higher-level learning.

Instructional Technology: a field concerned with improving the efficiency and effectiveness of instruction involving: designing instruction (including all the phases of activity from assessment to evaluation) and applying learning theory to instructional design.

Meta-Analytic: a statistical approach to combine results from multiple studies.

Morphological awareness: the recognition, understanding, and use of word parts that carry significance.

Reading disabilities: a learning disorder that involves significant impairment of reading accuracy, speed, or comprehension to the extent that the impairment interferes with academic achievement or activities in daily life.

Phonological deficit: implicating a core problem in phonological processing system of oral language.

Phonological awareness: refers to an individual's awareness of the phonological structure, or sound structure of words.

Processing speed/orthographic processing deficit: affecting speed and accuracy of printed word recognition (also called naming speed problem or fluency problem).

Web 2.0: the current state of online technology as it compares to the early days of the Web, characterized by greater interactivity and collaboration, more pervasive network connectivity and enhanced communication channels.

CHAPTER TWO: LITERATURE REVIEW

Academic Benefits of Technology

This research was conducted to identify the technology and multimedia applications that will help support middle school students with reading disabilities. According to Glatthorn, Boschee F., Whitehead, Boschee B. (2012) there is growing evidence showing that when implemented correctly, technology can have a significant impact on student achievement. “Research finds several beneficial outcomes that have been noticed when a relationship is established between technology, curriculum and learning” (Glatthorn et al., 2012, pp. 445). There are some academic benefits that technology, enhanced problem-solving skills, writing processes, content, and higher-order thinking skills can bring. Technology can help increase teamwork and collaborative inquiry and performance in basic learning skills. Technology can widen the scope of instructional opportunities (Glatthorn et al., 2012).

The question becomes does the use of technology improve student’s achievement? We live in a world where technology is all around us, in the classrooms, doctor’s offices, in newer cars, and the home. Teachers struggle to find instruction that will motivate students and set high goals for student achievement. Educators bring successful technology into the classroom, but still question if what they do is effective. According to Glatthorn et al. (2012), technology cannot only improve student achievements, but also create an enriched technological society that the student needs in order to impact students learning. Gulek and Hakan (2005) found that the use of technology increased student writing skills. Many educators have found that students are producing three times the amount of written documents as they did before word processors. Students are using keyboards more than a

pen or pencil to write, as they prepare for a 21st century future. Researchers show that students are writing more often because of greater ease when using technology. Gulek and Hakan (2005), who investigated the effects of computers on student writing, conducted a meta-analysis study that examined the impact students' writing skills using a computer had on their achievement. They found that students who used computers while learning to write were more engaged and motivated in their writings. Students at the secondary level produced more work that was greater in length and higher in quality. The hope for this research is to describe what contributes to learning in order for students with reading disabilities to be successful in literacy. The following is a list of outcomes for the use of technology that can be helpful for students with reading disabilities:

- “Motivates students to learn
- Allow students to learn at their own pace
- Provides additional resources for students
- Prepares students for the future,” (Kurzweil Education, 2015, pg. 1).

The trend of higher student achievement is more likely to increase with the advent of voice-recognition programs or other technological applications that will assist students with learning disabilities. Co-Writer is a software program designed to help students write complete sentences with correct spelling with just a few keystrokes. As a student begins to type, Co-Writer predicts the word and also suggests words for the student to select from. This technology can provide higher levels of achievement for student's writing skills because it can increase student vocabulary and provide more complex ideas and options. A growing body of evidence demonstrates that technology is a useful resource for educational needs. Laptop use with special education students has created classroom

instruction opportunities and improved research skills. Students with learning disabilities who use computers, improved their writing skills (Gulek and Hakan, 2005).

In today's 21st century learning environment, technology is built into powerful programs that allow students to check grammar, spelling and revise work. Grinager (2006) found that students who used a computer to take a test performed higher than those who took paper pencil test. Technology and curriculum are designed to meet educational needs in all areas of education for both the educator and the student. Methods such as cooperative learning, integration of curriculum, and greater application of learning styles have increased teacher communication and parent communication for an improved learner (Grinager, 2006).

The availability of digital technologies in the classroom allows teachers to take advantage of the interest and willingness of students to use technology. Several schools that are using networked computers in the classrooms, are finding this format can enhance and support cooperative learning opportunities. According to Glatthorn et al. (2012), when using computers in the classroom as learning centers, many teachers find it easier to have students engaged in a collaborative setting. As technology becomes an increasingly important part of students' lives, it is important for educators to determine the role technology should play in classroom instruction.

It is vital to systematically examine how classes operate and how students learn. Instructional technology combined with effective teaching methods can have a substantial impact on student's achievement. The key is how teachers use the technology, how they integrate it into their curriculum, and how they adapt their teaching methods to take advantage of the technology. By offering educators some assistance with adopting inquiry-

based and student-centered techniques, students will create higher-order thinking abilities, (Glatthorn et al., 2012).

How Technology Improves Learning

Technology can meet the instructional needs of students in different ways. Teachers can incorporate technology by conducting research, corresponding with others, creating or using graphics, movies, or using as a visual display. They can develop and present multimedia presentations, create art, music, movies or websites, and design and produce a product. Technology is designed to meet individual educational needs of students, and web-based applications allows students to access real-world research in a variety of fields. According to Glatthorn et al. (2012), during the year 2008, the overall ratio of students to instructional computers was 4-to-1. For some schools to justify the expense of installing and maintaining sophisticated technology, there needs to be hard evidence that technology enhances learning and increases achievement. Instructional technology is especially important in education. It creates a mobile classroom, prepares students for the future and allows students to communicate or connect anywhere in the world (Glatthorn et al., 2012).

Researchers showed that technology is supportive and enhances student achievement. Gulek and Hakan (2005), indicates that students from a middle school with a laptop program have obtained higher GPA results than students in a non-laptop school. The summary below shows this data.

Table 1: GPA Results of Students Use of Laptop vs Non-Laptop Program Enrollment:

Grade	Laptop	Non-Laptop
6	3.50	3.13
7	3.28	2.94
8	3.23	3.07

Table 1 Adapted from The Journal of Technology, Learning, and Assessment, p. 13, by James Cengiz Gulek & Hakan Demirtas, 2005.

Research from Hanover Research Council from 2010, looked at the impact of 1-to-1 laptop initiatives on student achievement, particularly focusing on reading and writing areas and discovered significant progress in the students' English Language Arts (ELA) scores. Figure 2 below shows greater improvement with students' ELA scores for laptop students than non-laptop students.

Figure 2: Changes in ELA Scores: Laptop and Non-Laptop Groups

	Year 1	Year 2	Combined
Total ELA			
<i>Laptop</i>	19.56%	2.19%	21.74%
<i>Non-laptop</i>	26.67%	-16.83%	9.83%
<i>Difference</i>	-7.11%	19.02%	11.91%
ELA Subtests			
Literary Response and Analysis			
<i>Laptop</i>	-0.05%	3.76%	3.70%
<i>Non-laptop</i>	-0.04%	2.76%	2.72%
<i>Difference</i>	-0.01%	1.00%	0.98%
Writing Strategies			
<i>Laptop</i>	4.37%	1.89%	6.26%
<i>Non-laptop</i>	4.57%	0.19%	4.76%
<i>Difference</i>	-0.20%	1.70%	1.50%

Source: Journal of Technology, Learning and Assessment

Figure 2: Adapted from the Journal of Technology, Learning and Assessment, p. 16, by Hanover Research Council, 2010.

Figure 2 shows during year one of the program, both laptop and non-laptop groups made improvements to their ELA scores. While in year two, the non-laptop group dropped by 17% and the laptop students increased only by 2%.

Role of the Teacher in the Use of Technology

Often teachers are not able to use technology for instruction much of the time because of other duties they have during instructional time. Individuals who are not in education may not realize there are numerous tasks a teacher must perform. According to Hooper and Rieber (1999), educators must include planning and implementing instruction, as well managing a group of people, meeting student psychological and social needs and motivating all students to put forth their best efforts. Teaching is an unreasonable, demanding and almost impossible job to do, without adding the demands of incorporating technology into instruction.

Teachers recognize the need for ongoing evaluations of student learning to refine and enhance the use of technology in the classroom. The technology consists of the designs and environments that engage learners. If used to engage students in meaningful learning, technology has the potential to transform education. To make technology a valuable tool, educators must make two things happen. First, the classroom must become a learning center and second, students and teachers work together in collaboration with technology for the purpose of creating a learning community (Hooper and Rieber, 1999).

Educators can attribute a significant increase in student achievement through the use of technology. Technology is more than hardware. It consists of creative lesson designs and environments that engage learners. If used to engage students in meaningful learning, the Internet has the potential to transform education. In the past, the teacher's primary responsibility and activity has been directly instructing students, teachers as purveyors of knowledge and students, the recipients. The teachers taught what they knew and how they interpreted the world according to textbooks and other resources. Teachers are hired and

rewarded for their content expertise. Students would take notes on what teachers told them and tried to comprehend the world as their teachers described. Today, students should construct their own knowledge and meaning of the world. The teacher's role is shifting from dispensing knowledge, to helping students create more viable conceptions of the world (Glatthorn et al., (2012).

Teachers must learn how to use technology themselves. They must gain skills and fluency with technology. Often, teachers will learn along with the students. Most teachers find these technology implications challenging. Just as teachers assume new roles in education, learning with technology requires students also assume new roles. For technology to be effective in the classroom, educators need to begin from the earliest starting point. Administrators can take a look at the school's focus and teachers' goals to evaluate technology needs in their classrooms. Benefits of technology in the classroom can assist educators with assessments, data-driven instruction, defined standards and a very powerful instructional management tool (Glatthorn et al., (2012).

A model for adopting technology was designed for teachers to increase their use of technology in the classroom. Hooper and Rieber (1999) created the following model presented in Figure 3, as a resource for teachers to consider. The phases include Familiarization, Utilization and Evaluation. Phase one is Familiarization and it focuses on initial exposure to technology. The second phase is the Utilization Phase which is when a teacher tries out the technology in the classroom. The third phase, Evaluation Phase, serves as a reminder that the educational system must continue to adapt and evolve. Phase four focuses on the Integration Phase, the phase of adoption. Phase five is Reorientation and requires educators to find the purpose and function of the classroom. The final phase is

Evolution phase, which is the remainder of the educational system (Hooper and Rieber, 1995).

Figure 3: A model of adoption of both “idea” and “product” technologies in education.

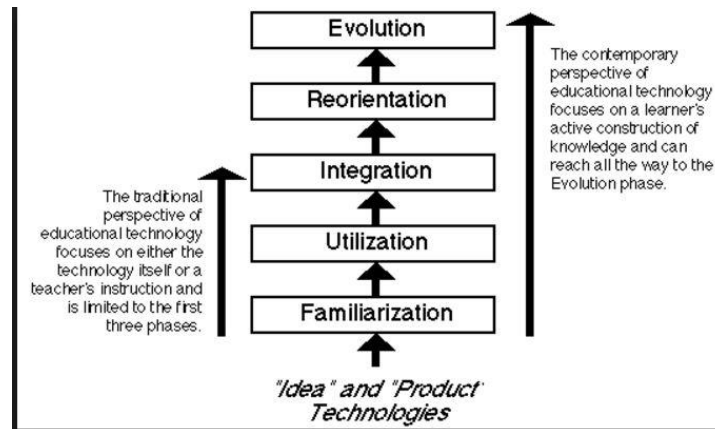


Figure 3 Adapted from Teaching with Technology, pp. 154-170, by S. Hooper & L.P. Rieber, 1995.

Once educators have decided to take the next step to use technology in their instruction, they must decide what role technology will have in their classrooms. There are two main types of technology roles in education: product technologies and idea technologies. Hooper and Rieber (1995), explain that product technologies include hardware and machine-oriented technology such as audio-visual equipment, laptops, projectors, computer software, etc. Idea technologies include represented or product technology, such as giving the students experiences with the technology, taking a group project and using Google Documents to work to collaborate online. Other factors to consider for technology in education are the educational goals and outcomes that will be achieved with technology in the classroom and how technology can facilitate a more meaningful learning process (Hooper and Rieber, 1999).

Once a teacher decides on the role of technology in his or her classroom, some districts have found it appropriate to measure the teacher's level of technology knowledge.

Some suggestions include planning staff development meetings to help faculty learn share ways to incorporate technology into the classroom and to see their knowledge of technology. By combining professional development that is targeted toward ways to help staff, participants can make connections between technology and the willingness to initiate the changes in their practices. According to Moersch (1998), creating a conceptual framework that measures the level of technology implementation in order for school districts to assist in achieving teacher skills in processed-based instruction, uses of technology and assessment.

As computers and technology use in classrooms have grown over the years, there is an active interest in which technologies are employed in the classroom. Technology can motivate a wired generation of students and support educational needs of students in many ways. Teachers can incorporate technology by conducting online research, online videos, Podcasts, PowerPoint, interactive games, blogs, wikis, websites and infographics. The following skills have been established through technology as a resource on web tools in

Table 2: 20 Digital Skills Every 21st century Teacher Should Have

(Table 2) 20 Digital Skills Every 21st century Teacher Should Have

<u>Create and edit digital audio</u>	<u>Use Social bookmarking to share resources with and between learners</u>	<u>Use Blogs and Wikis to create online platforms for students</u>	<u>Exploit digital images for classrooms use</u>	<u>Use video content to engage students</u>
<u>Use infographics to visually stimulate students</u>	<u>Be able to detect plagiarized works in students assignments</u>	<u>Use Social networking sites to connect with colleagues and grow professionally</u>	<u>Create and deliver asynchronous presentations and training sessions</u>	<u>Compile a digital e-portfolio for their own development</u>
<u>Create screen capture videos and tutorials</u>	<u>Curate web content for classroom learning</u>	<u>Use and provide students with task management tools to organize their work and plan their learning</u>	<u>Use polling software to create a real-time survey in class</u>	<u>Understand issues related to copyright and fair use of online materials</u>

<u>Use digital assessment tools to create quizzes</u>	<u>Find and evaluate authentic web based content</u>	<u>Use digital tools for time management purposes</u>	<u>Use note taking tools to share interesting content with your students</u>	<u>Use of online sticky notes to capture interesting ideas</u>
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<http://www.educatorstechnology.com/2012/06/33-digital-skills-every-21st-century.html>

According to Schacter (1999), who used a Meta-Analytic (a statistical approach to combine results from multiple studies) from results of more than 500 individual studies to draw the conclusion that there are positive and negative findings on student achievements:

Positive Findings:

- On average, students who used computer-based instruction scored at the 64 % on test performance compared to students in the control conditions without computers who scored at the 50 %
- Students learn more in less time when they receive computer-based instruction
- Students like their classes more and develop more positive attitudes when their classes include computer-based instruction
- Students in technology-rich environments showed increased achievement in preschool through higher education for both regular and special needs children
- Students’ attitudes toward learning and their self-concept improved consistently when computers used for instruction (Schacter, 1999, p. 4).

Negative Findings:

- Computers did not have positive effects in every area in which they studied
- The level of effectiveness of educational technology influenced by the particular student population, the software design, the educator’s role, and the degree of student access to the technology (Schacter, 1999, p.4).

Assistive Technology

According to Keengwe (2007), there has been a remarkable improvement in access and adoption of technology in preparing teachers to use assistive technology. But several reports have indicated that faculty members are not integrating technology into their instruction. In order to help faculty members, make decisions on student learning, there needs to be current knowledge of faculty integration practices. Keengwe (2007) examined

the relationship between faculty integration of technology into their classroom instruction and students understanding of the effects of technology to improve their learning. Faculty and students were surveyed to measure technology usage. Based on Keengwe's (2007) survey, students needed direct instruction to learn how to use computer technology applications in the classroom. Faculty members need more professional development opportunities to infuse technology into instruction, such as webinars or in-services that focuses on technology programs that improve reading disabilities.

According to Bridges to Reading (2000), assistive technology is defined as any item, piece of equipment or system that helps people bypass, work around or compensate for learning disabilities. Assistive technology can be divided into two primary groups: hardware, which refers to equipment and software, which refers to programs that run on computers. The motivation behind assistive technology is to work around particular deficiencies, and support them. Assistive technology helps students with reading disabilities achieve their full potential and live enriching lives. According to Higgins and Raskind (2000), some examples of assistive technology can include reading machines that read books out loud and speech recognition systems. Assistive technology can help students work around their disabilities by focusing on their strengths rather than their weaknesses. Unfortunately reading disabilities are not cured and cannot be outgrown but with hard work and helpful tools such as technology, students with learning disabilities can learn how to compensate for them (Higgins and Raskind, 2000).

The National Center for Technology Innovation (2004) conducted a review of technology based approaches for Reading Instruction Tools, and identified six categories of technology uses that support students with reading disabilities (Silver-Pacuilla, Ruedel,

& Mistrett, 2004). The following table gives a general overview of the categories, the reading skills being exercised, educational strategies and products related to each category (Silver-Pacuilla, Ruedel, & Mistrett, 2004, p.16-17).

	<p>informational resources</p> <ul style="list-style-type: none"> • Participate in literacy communities • Engage in research 	<p>different reading levels</p> <ul style="list-style-type: none"> • Embeds hyperlinks to additional information • Probes, questions, elicits prediction and analysis 	
Converting text to speech (TTS)	<ul style="list-style-type: none"> • Phonemic awareness • Phonics or alphabetic code • Fluency and automaticity • Comprehension • Exploration of a wide range of texts • Engagement in research • Increasing exposure to a variety of technological and informational resources • Using language to accomplish their own purposes 	<ul style="list-style-type: none"> • Read aloud any amount of text • Highlight text as it is read aloud to support tracking • Read and navigate the Internet • Customize text presentation as it is read aloud 	<ul style="list-style-type: none"> • Simple Text (Apple) • Text Readers (ReadPlease, ScreenReader) • Talking word processors • Scan to Read programs (Kurzweil, WYNN, Read & Write Gold)
Providing text in alternate formats	<ul style="list-style-type: none"> • Phonemic awareness • Phonics or alphabetic code • Fluency and automaticity • Vocabulary 	<ul style="list-style-type: none"> • Increase engagement with talking storybooks • Combine text with symbols and pictures 	<ul style="list-style-type: none"> • Living Books • Rebus Programs (Clicker4, News to You; Writing with Symbols) • Audio Supplements to Text (Read 180, Start to Finish) • Scan to Read programs (Kurzweil, WYNN, Read & Write Gold) • DAISY books, eReader, easEREADER

	<ul style="list-style-type: none"> • Word analysis • Comprehension • Increasing exposure to a variety of technological and informational resources • Participation in literacy communities • Exploration of a wide range of texts • Using a wide range of strategies • Application of knowledge of language to create and critique text • Motivation 	<p>(rebus software)</p> <ul style="list-style-type: none"> • Provide access to digital books and texts • Convert print to speech 	<ul style="list-style-type: none"> • Text to Audio (CoolSpeech, Audible.com, Visual Thesaurus)
Providing electronic resources	<ul style="list-style-type: none"> • Phonics and alphabetic code • Vocabulary • Word analysis • Comprehension • Increasing exposure to a variety of technological and informational resources • Motivation 	<ul style="list-style-type: none"> • Immediate access to dictionary for pronunciation and meaning • Online tools • Portable reference tools 	<ul style="list-style-type: none"> • Reading Pen • Franklin devices • On-Line resources • (libraryspot.com, Visual Thesaurus)
Organizing ideas	<ul style="list-style-type: none"> • Comprehension • Application of a wide range of strategies 	<ul style="list-style-type: none"> • Arrange and easily rearrange ideas 	<ul style="list-style-type: none"> • Outline view in many word processors • Kidspiration/Inspiration • Viso • Draftbuilder

	<ul style="list-style-type: none"> • Application of knowledge of language to create and critique text • Increasing exposure to a variety of technological and informational resources • Motivation 	<ul style="list-style-type: none"> • Represent conceptual relationships • Switch from diagram view to outline view 	
Integrating literacy supports in a single application	Potentially all the skills and strategies cited above	E-Reading environment that converts TTS, manages e-books, including talking word processors and spell checkers with a range of embedded, at the ready supports	<ul style="list-style-type: none"> • Kurzweil • WYNN • Read + Write Gold • eReader

Table 3 Adapted from National Center for Technology Innovation pp.16-17 by H. Silver-Pacuilla, K. Ruedel & S. Mistrett, 2004.

Summary

Educational technology should not focus on how many computers are in the classroom, but rather on how they are used. A 21st century learning environment can better facilitate the integration of technology into a curriculum in order to have a positive effect on learning. The traditional classroom needs to be changed to an environment more conducive to engaged learning. Findings support that technology can be a vital resource that enhances student learning, if used appropriately. As with any new instructional methodology, questions arise on how to use it correctly, and teachers need to be trained in order to use it. Teachers also must generate quality lessons for technology to be successful. Training for teachers should be a priority before implementing technology into the classroom. The steps for implementation would suggest teachers use a device for themselves, to explore how to use the technology, and then be trained on using it in the classroom. Teachers then could take classes or professional development to meet their needs. Classes could be offered throughout the year for iPads, Chromebooks or other technology-driven hardware.

CHAPTER THREE: METHODOLOGY

Introduction

The objective is to measure, examine and identify how the use of technology can support the academic achievement of middle school students with reading disabilities. As a mixed methods study; teachers, parents and students were surveyed on what technologies are being utilized in the classroom and at home as a support for student achievement. Analysis of the School District's Educational Assessment data was used to measure achievement. The Standardized Test for the Assessment of Reading (STAR) assessment provided 2015-2016 scores regarding academic accomplishment of sixth grade students with reading disabilities. The technology that the school incorporated to help support students with reading disabilities was identified. The central research questions were developed based on the current literature review on the impact of technology on student academic achievements (Grinager, 2006). How does the use of technology enhance the academic achievement of middle school students with reading disabilities? What educational technology do reading teachers use in the classroom? What educational technology support do students have at home for their reading disabilities? Chapter three presents a detailed overview of the purpose, describes the research methods used and includes the research questions, population and sample, instrumentation, procedures and the data analysis.

Research Design

A mixed methods approach was selected to explore the use of technology as an enhancement for students with reading disabilities. Quantitative methodology was selected based on surveys to explore what technology was being used at school and home to support

students. This allowed a qualitative descriptive analysis. Three survey instruments were given to teachers, students and parents at the middle school level. The specific data collection instruments were created to support the research questions and purpose of the study. The qualitative data are coded by categories, such as beliefs on technology, comfort level with technology and use of technology. An observation matrix (Appendix H) was used to observe one sixth grade lower-level Language Arts class in order to determine what technology was available to teachers and students.

Description of Sample

The study examined institutional data from a suburban school district in St. Louis County, Missouri, regional area. This premier school district includes high student achievement, outstanding teachers and staff and a great community. The district's mission is stated as doing whatever it takes to ensure all students realize their potential. According to the 2016 U.S. News the district's high school is ranked number five in the state of Missouri. The study was conducted with students with sixth grade students, who have reading disabilities and their reading achievement scores during the 2016 academic year, from September through November.

Sample

The data set included reading achievement data for middle school students enrolled in the academic year 2015 to 2016. One middle school with enrollment of 740 students 232 sixth grade students, 237 seventh grade students and 253 8th grade students was chosen. The demographics of this school includes 9.7% Asian, 9.5% Black, 2.4% Hispanic and 76.6 % White. The average daily attendance rate was 95.9%, with 17.2 % students eligible for free, or reduced price meals. The ratio of students to regular classroom teachers was

14-to-1. The average years of teacher experience was 13.4 years, with 100% of certified teachers, 70% of the teachers hold advanced degrees. The district has 19 elementary schools, six middle schools, four high schools, two early childhood locations and a gifted program. The population studied was 50 students with reading disabilities in one middle school. Parents of the students and 30 teachers participated in the research. The criteria for selection was that the students were in grade six with a reading disability.

Sampling Procedure

The number of subjects including teachers, parents, and students participated in the survey, for a total of 75-100 participants. A total of 50 students, 30 teachers and 15 parents participated in the surveys. The 30 teachers that participated consisted of language arts, science, social studies, math, elective teachers and special school district teachers. The study was conducted during the months of September of 2016 through November of 2016. All the student participants were from a single language arts teacher who worked with lower-level reading students. The language arts teacher emailed the parents and students the surveys that took 10 minutes to complete online. The school principal emailed the teacher surveys to 30, teachers who completed a 20-minute survey online. There were no anticipated risks to the subjects associated with this research. Subject of participation was voluntary. All of the survey data will be kept confidential to protect the identity of the participants. The data that were collected from this study was stored in a file with the researcher and was destroyed after the study. No personal information of the participants was obtained.

Instrumentation

The precise data for analysis was the Educational Technology Assessment data from 2016-2017 school year. The instruments used included a review of all the technology used in the classroom, student reading scores (STAR), observation of the sixth-grade classroom technology usage and Likert scale surveys. All the tools were made with the purpose of addressing any issues of reliability and validity. Three different types of surveys, including a consent form, associated with the use of technology and student's academic achievement was developed. There were a number of interesting questions that were created for the teachers, parents and student surveys. Questions from the survey were sorted into categories: teacher background information, student technology use, teacher technology use, technology leadership, technology beliefs, digital learning and web 2.0 and technology support.

Three instruments were used to measure possible effects of the use of technology:

Instrument 1: Teacher Survey (22 questions) Appendix F,
Instrument 2: Parent Survey (24 questions) Appendix E, and
Instrument 3: Student Survey (11 questions) Appendix G.

The first was a survey for teachers who work with reading impaired students, and two additional questionnaires one for parents and one for learners who are affected by a reading disability. The surveys were administered to teachers, parents and students during the school year of 2016-2017. Google Forms was used for creating the survey instrument. The web-based survey tool incorporated questions that related to all three surveys. The Likert scale surveys provided data from the teachers, parents, and students. The teacher's 22- open ended question survey included categories such as teacher demographics, student technology use, technology leadership, technology beliefs, digital learning, web 2.0 and

technology support. The parent's 24-question survey included the following categories demographics, technology use in home, student technology use, and reading tools. The students 11-question survey included background, technology in the home, student technology use, and technology as reading tools.

Data Collection Procedures

Before beginning data collection, the project was approved by the University of Missouri-St. Louis graduate school and Innovative Solutions for Compliance and Research Management (IRB) committee. The participants and the school used were assured that their participation was voluntary and confidential. The data collection began during the months of September 2016 through December 2016.

The surveys were released electronically to respondents in September 2016 and were due by November 2016. The middle school's principal, selected a language arts teacher to distribute the surveys electronically to the students with low reading scores. The language arts teacher worked in a classroom within a classroom, in sixth grade. Each class that this teacher worked with consisted of sixth grade level students and has four sections at each grade level. The language arts teacher holds a certification in language arts and is additionally certified as a reading specialist. The language arts teacher works particularly with students who have below average reading and writing skills. Within the classroom, there is another teacher assigned to work as a team with the language arts teacher, helping the students improve their reading and writing levels. This second teacher is certified in special education and who works with students with special needs or disabilities. Every student in this classroom setting has an Individualized Educational Plan (IEP) specifically due to low reading scores or writing skills. A typical class can involve the same grade

level students, all at the same reading levels, in a small classroom environment, with only 12-15 students per class working with two teachers. The two teachers continue to work with the students during the year to improve their reading and writing levels.

To ensure diminutive burden on the respondents, the survey lasted 20 minutes per contributor using a Likert scale instrumentation. The reported data was compiled and made available to the district and the middle school. The students' reading scores from the school year 2015-2016 was used to determine the students to participate in the survey.

The recruitment and informed consent process began in August-October 2016 with the teachers and parents. During this time frame, participants took the online survey at home for parents and at school for teachers and students. After the consent forms were signed and collected by the principal, he then emailed the teachers their survey. A total of 30 teachers volunteered to take the survey, which included language arts, science, social studies, math and special school district teachers. Once the surveys were taken, the results were sent to the researcher via a web tool. The language arts teacher emailed the consent forms and collected the forms from the parents and students who participated in the surveys and returned the signed consent forms to the researcher. The results from the parents and students who participated were instantly sent to the researcher via the web tool that was used for the surveys.

Once the consent forms were signed by both the parents and students, the language arts teacher distributed the surveys via email. A total of 50 sixth grade students participated in the survey. Parent participation was lower than expected. The students took the surveys starting in September of 2016 in a classroom setting at the school. The principal selected the students who are identified as struggling readers based on the presence of an IEP. The

principal did not give the researcher the names of the teachers, parents or students who took the online surveys. The data that was collected from this study was destroyed after the study. No personal information of any of the participants was disclosed.

Data Analysis

A descriptive analysis was used such as means and range to analyze the demographic information. A Google Forms tool, was used to create a visual graphic from the survey results. Three different surveys were used to describe what technology use can support student's academic achievement. Once all the surveys were completed in November of 2016, the data was analyzed to make an inferential analysis conclusion on the use of technology that supports the academics of students with reading disabilities. According to Orcher (2014), "inferential statistics are used by researchers who have sampled from a population" (p. 173).

Validity and Reliability

Validity and reliability are two important ingredients in a quantitative research. According the University of Northern Iowa (2005), validity is referred to how well a test measures what it is purported to measure. To guarantee validity, each of the surveys were sent to non-participant individuals, consisting of teachers from a different school, parents outside of the study and students who did not participate in the study. This method allowed the opportunity to pilot the survey first, so there would reduce the chance of errors with the questionnaire. Feedback was used to validate the survey before administrating the final surveys to the true participants of the study. The surveys that were used have a convenience sampling in this study. Convenience sampling methods

refers on data collection from population members who are conveniently available to participate in a study.

Chapter Conclusion

Chapter three presents the research questions and the research design methodology that was used. The chapter covers a description of the population and sample, instrumentation, data collection and surveys. The primary focus of this dissertation was to determine how the use of technology can support students with reading disabilities at home and at school.

CHAPTER FOUR: DATA ANALYSIS AND RESULTS

Introduction

Chapter four presents the analysis of the data. How the use of technology supports sixth-grade students with reading disabilities was explored. The data analysis was divided into three sections. The first section presents the descriptive analyses of the research. The second section presents the results from the survey questions. The third section presents the results from the STAR achievement test scores. For this research, classroom technology was explored, along with student's involvement with the technology used as a tool for academic achievement. This study examined students in grade six with reading disabilities and described the technology used by the school that is incorporated to help support students with reading disabilities. The findings from this quantitative and descriptive analysis are presented in this chapter in detail. The researcher created and collected data through three surveys that were taken by teachers, parents, and students with reading disabilities, as well as reading test scores of the students who participated in the surveys were analyzed. In addition, one sixth-grade classroom was observed for use of technology and used an observation matrix (Appendix H). The following research questions guided the study:

1. In what way does the use of technology support the academic achievement of sixth-grade students with reading disabilities?
2. What educational technology do teachers use in the classroom?
3. What educational technology support do students have at home to help overcome their reading disabilities?

Technology available at Middle School

The study population surveyed was a middle school which was one of six middle schools in a K-12 school district, in St. Louis County, in the state of Missouri. For the purpose of this research, the district will be referred to as Northwood School District. This middle school shares the same goals of the district and it also has its own mission. The Middle School believes they can make a difference in the lives of students and accept and respect individual differences. The staff pledges professional skills in educating all the students. Both a quantitative and descriptive analysis approach was used in order to survey three different groups of participants (Appendix E, F, and G). A survey was created for each group; one to survey students, one for teachers, and one for parents. Data from all three surveys, student's reading scores from the school year 2015-2016, a classroom observation, and the school district's educational technology assessment program was used to determine the effects technology had on reading achievement.

A sixth-grade language arts teacher, who works with students who have low reading scores, administered the student survey in four classrooms. With permission of parents who signed the consent forms, 63 sixth grade students were asked to participate in the study. Of the 63 students, only 50 students chose to participate in the study. The parents of the 50 students participating in this study, were asked to take a 24-question parent survey. This same teacher emailed the online survey to the parents of the 50 students in the fall of 2016 with only five parents responding. Due to the low number of parents participating, the researcher asked the teacher to re-email the survey out to the parents at the end of January of 2017. After a two-week deadline, 10 more parents participated in the survey, resulting in a total of 15.

The principal of this middle school distributed the survey to the teachers. The principal emailed 65 teachers, including three building administrators for participation in the survey. Thirty teachers participated in the study. From each survey, the researcher found two important themes to the survey questions. The first theme was the use of technology and the second theme, the purpose of technology.

Descriptive Analysis

In order to view what technologies were being used in the classroom. One of the sixth-grade language arts classes was observed. This particular classroom consisted of 13 students, all with lower-level reading and writing scores and reading disabilities. All the students were assigned by their reading levels. The classroom setting is called a “classroom within a classroom”, where there are two teachers assigned to the classroom to help assist students with improving their reading and writing skills. An observation matrix (Appendix H) was created to keep track of what technologies were being used in the classroom to support students. The district began using Google Education/Classroom in the classroom in summer of 2015. All students and staff have access to Google. This Google App is specifically designed for education and is easy to use. It is an online solution that provides students an interactive approach to learning while gaining 21st century skills. The applications within this program work on several devices such as Windows, Apple and Android. Students have access through Google 24-7 from any device and from any location. Google Drive is the main element of Google Apps for Google Education.

Google Drive provides the following:

- Unlimited electronic storage accessible from school and other locations

- Google Docs (word processor)
- Google Slides (presentation)
- Google Sheets (spreadsheet)

With Google Drive, students can stay organized and stay on top of their assignments. Google Drive has easy access to get feedback from teachers, and students can access their work from school or home. A great feature is the online revisions history that allows students to see how their assignments have evolved over time. Teachers have access to students' documents on Google Drive to monitor student progress. This allows for teachers to give students guidance while the student is in the formative process of learning and still working through the assignment. Through this revision history, the teacher can see the student's work on any project.

It was observed that the district and middle school uses Google Education in the following ways:

- Google Drive
- Google Classroom
- Gmail (school email)
- Google Sites
- Google calendar (which is shared to parents with classroom assignments/quizzes)
- Google Hangouts
- You Tube
- Google Maps
- Google Cultural Institute
- Google Voice
- Google Scholar
- Google Translate

This district uses Google for many reasons. Google Apps for education, security, reliable 24/7 access, unlimited storage, real-time collaboration and ability to share and provide feedback. The teachers at this district have the advantage of engaging their student

learners within Google Classroom by creating assignments, announcements and discussions in their classroom pages. Students turn in their work digitally from any location, such as school or home. Teachers have access to easily monitor students' progress and provide feedback instantly. As of the fall of 2016, this middle school became a 1-to-1 laptop environment, distributing Chromebooks to students for use at school and at home. Google Chromebooks have gained popularity in several school districts throughout the country, according to Education Week (2014). Educators have included Chromebooks into their curriculum because of their low cost and popularity. Chromebooks run exclusively on Google Chrome operating system and has access to Google products such as Google Apps, Google classroom and drive. Students leave their school textbooks at home and use online textbooks at school. Using technology, the online textbooks can be read to the students if the student needs help with long reading material. Parents and students are provided a weekly email updates through Google Classrooms. It provides parents with all the classroom news, calendar of homework assignments and when exams will be given for each class. Figure 4 below is a picture of the calendar and classroom information is presented below.

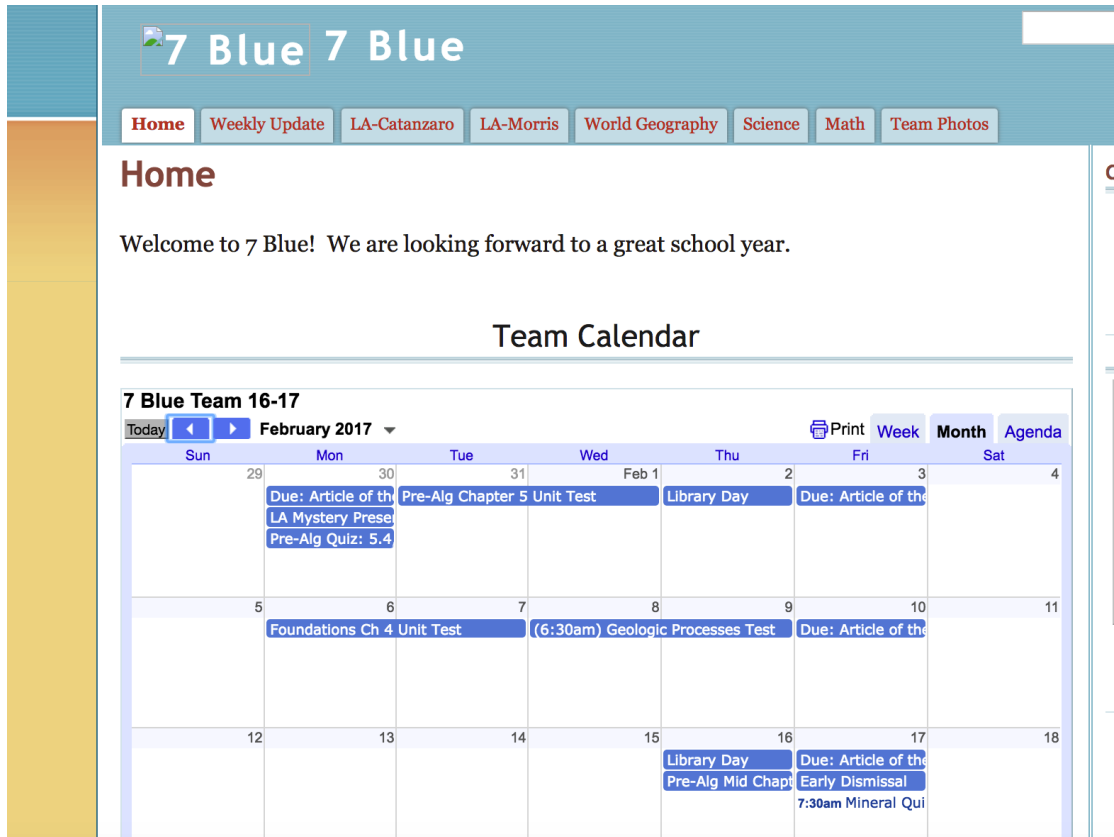


Figure 4: Adapted from Middle School email team calendar and class subject’s news.

Research Question #1: *In what way does the use of technology support the academic achievement of sixth grade students with Reading Disabilities?*

To help answer research question one, data was taken from the student surveys and the students’ responses to how they use technology to support their education. A total of 50 students in sixth grade participated in the 11-question survey (Appendix G), which included questions that relate to their technology use in the classroom and at home. The following (Table 4) describes the technology theme that the researcher found important to support research question one. Two important themes based were discovered on the student’s survey (Appendix G): a.) Use of Technology b.) Purpose of Technology.

Table 4: Student Survey Responses

Student Survey Responses

Technology support in the classroom.						
Q2	Daily	Weekly	Often	Sometimes	Not Very Often	Never
How often do you use a computer in school?	81.6%	2%	14.3%	2%	0%	0%
Q4	Very Important	Pretty Important	Not Very Important	Not Important At All		
How important to your learning do you feel having access to technology is (do you learn better from the use of technology?)	38.8%	53.1%	8.2%	0%		
Q5	Internet	Research	Writing Papers	Learning Material	Watching Videos	Playing Games
What do you use computers for the most in the classroom?	58%	74%	76%	70%	26%	22%
Q10	Desktop Computer	Laptop Computer	iPad	iPhone/Cell Phone	Other	
What is the device you feel you learn the most using?	6.1%	63.3%	10.2%	12.2%	8.2%	
Q11	Strongly agree	Agree	Disagree	Strongly disagree	No opinion	
Technology is important to my learning experience.	50%	44%	0%	0%	6%	

Of the 50 students who participated in the survey, 100% were in the sixth grade with a mixture of boys and girls with low reading scores. From the student survey, question two asked, “How often do you use a computer in school?” 81.6% reported daily, 2% reported weekly, 14.3% often, 2% reported sometimes, 0% not very often 0% never. Only 49 of the 50 students responded to question two of the survey, the researcher is guessing that one student skipped or missed the question by mistake. The figures 5, 6, 7, 8, and 9, shows the student’s responses.

Figure 5

2. How often do you use a computer in school? (49 responses)

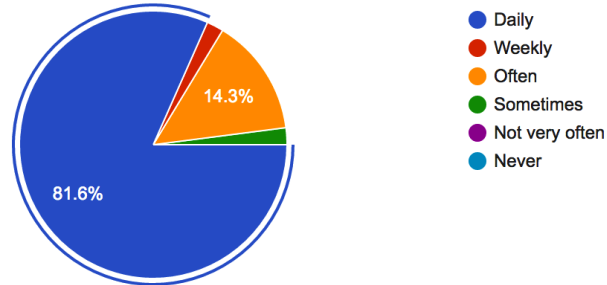


Figure 5: Adapted from student surveys.

Question 4 from the student survey asked, “How important to your learning do you feel having access to technology is (do you learn better from the use of technology?” Students reported 38.8% felt it was very important, 53.1% reported pretty important, 8.2% reported not important, 0% reported not important at all. Figure 6 below reports question four results.

Figure 6

4. How important to your learning do you feel having access to technology is (do you learn better from the use of technology)? (49 responses)

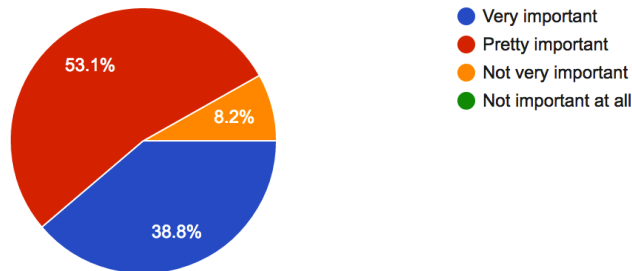


Figure 6: Adapted from student surveys.

Question 5 “What do you use computers for the most in the classroom?” As stated from the Figure 7, students reported 58% Internet, 74%, research, 76% writing papers, 70% learning material, 26% watching videos, while 26% reported playing games.

Figure 7

5. What do you use computers for the most in the classroom? (Check all that apply.)

(50 responses)

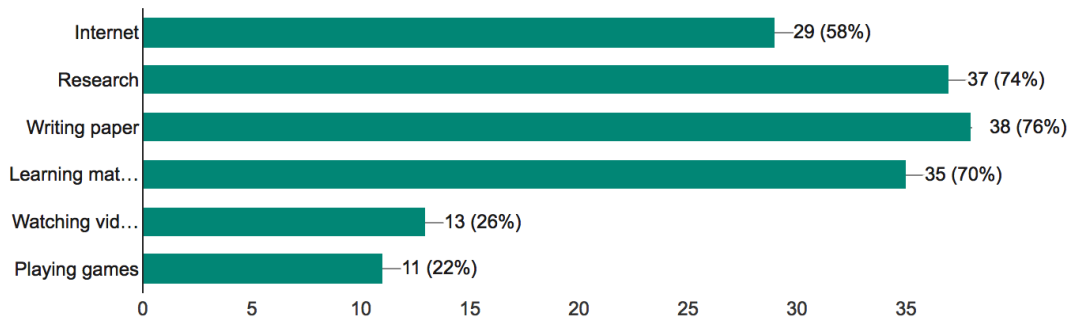


Figure 7: Adapted from student surveys.

Question 10 of the student’s responses from student survey questioned, “What is the device you feel you learn the most using?” Desktop computer was reported at 6.1%, students reported 63.3% a laptop computer, an iPad was reported by 10.2% of the students, 12.2% for iPhone/cell phone and 8.2% reported other.

10. What is the device you feel you learn the most using? (49 responses)

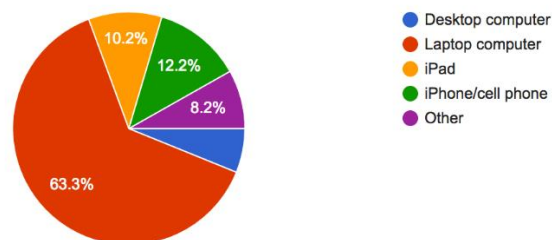


Figure 8: Adapted from student surveys.

Question 11 states students, “Technology is important to my learning experience.”

The results were 50% of students responded strongly agree, 44% agreed and 0% disagreed.

11. Technology is important to my learning experience. (50 responses)

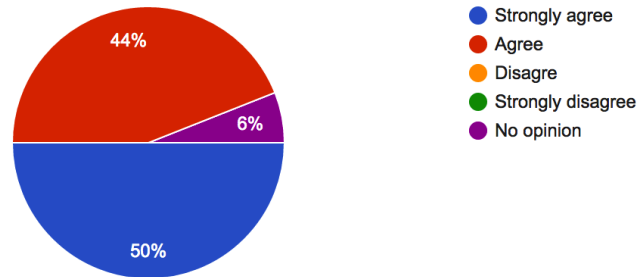


Figure 9: Adapted from student surveys.

Research Question #2: *What educational technology do teachers use in the classroom?*

To help answer research question two: “What educational technology do teachers use in the classroom?” Data from the 22-question survey (Appendix F) that was taken by 30 teachers was used. The 30 teachers consisted of language arts, science, social studies, math, elective teachers, special school district educators and building administrators. The survey entailed items such as teacher background, teacher technology use, technology leadership, technology beliefs and technology support. To answer question two, from the teacher’s responses Table 5 was developed.

Teacher Background and Technology Use

Table 5: Teacher Survey Responses

Teacher Survey Responses

What educational technology do teachers use in the classroom?						
Q6						
What other technology tools, if any, do you have your students use?						
Q7	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree	
Has technology improved the effectiveness of your classroom?	36.7%	46.7%	16.7%	0%	0%	
Technology Beliefs						
Q15	Technology functions as an effective tool for helping students master the state academic content standards.	Use of technology makes the process of learning more interesting for students.	Technology improves the effectiveness of my teaching(makes my job more interesting).			
How would you describe your beliefs regarding educational technology?	76.6%	90%	70%			

The teachers who participated in the survey were teaching grades 6-8 in all subject areas, language arts, science, social studies, math, elective teachers such as art, foreign languages, FACS, technology, special school district teachers and administrators. The following figures describes the teacher’s years of service and subject content they teach.

2. Including the current year, how many years of teaching experience do you have?

(30 responses)

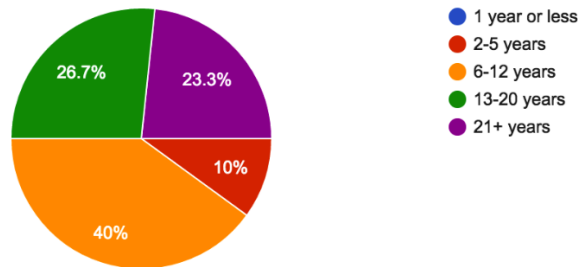


Figure 10: Adapted from teacher surveys.

What subject(s) are you teaching this year?

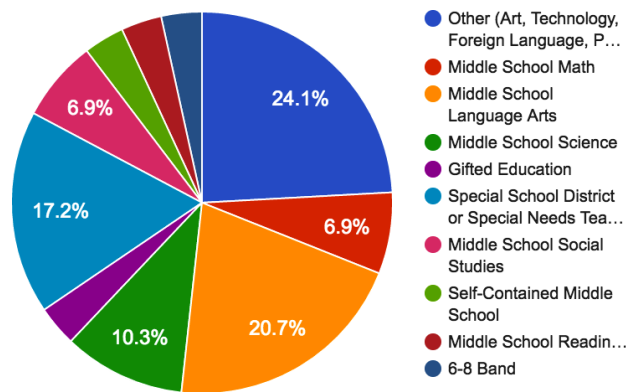


Figure 11: Adapted from the teacher survey.

Of the 30 teachers who participated, 10 % of the teachers have two to five years of teaching experience, 40% have been teaching for six to twelve years, 26.7% have thirteen to twenty years of teaching experience and 40% have been in education for more than twenty-one plus years and hold Missouri state teaching certifications in their content area of teaching.

Question 7 asked the teachers “Has technology improved the effectiveness of your classroom?” Nearly 37% strongly agree, 46.7% agreed, 16.7% were neutral, 0% disagreed and strong disagreed.

Has technology improved the effectiveness of your classroom? (30 responses)

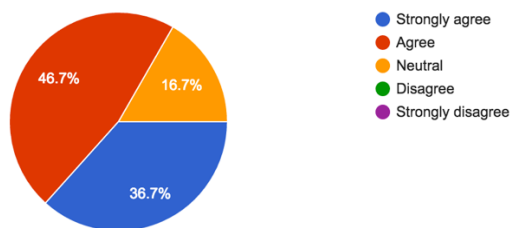


Figure 12: Adapted from the teacher surveys.

Question 6 as stated in figure 12, ask teachers, “What other technology do you have your students use? 3.4% teachers reported social learning which includes; (Edmodo, Edu Blogs, Wikispaces, Pinterest and Twitter). 17.2% reported Khan Academy, 24.1% reported for Wordle, 13.8% reported for QR Codes, 58.6 % reported for Quizlet, 82.8 % for Google Docs, 79.3% for YouTube, 20.7% for Ted-Ed, 13.8% for Google Education, 3.4% for Dropbox and 0 % reported for Fun Brain, Animoto and Evernote. See the graph below.

6. What other technology tools, if any, do you have your students use? (Check all that apply.)

(29 responses)

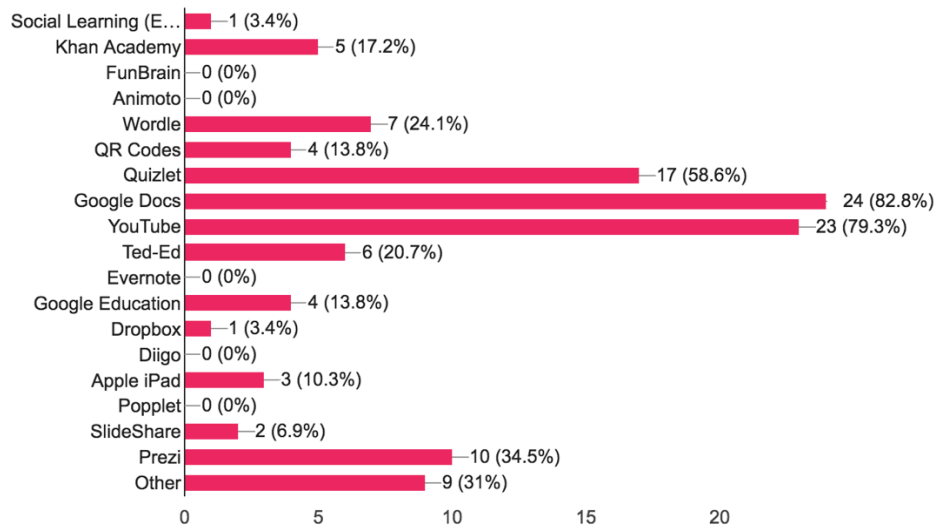


Figure 12: Adapted from the teacher survey.

Table 8 organizes the comments from teachers on the last question of the teacher survey. Question 22 asked, “*How do students benefit from technology in your classroom?*” Two important themes emerged from the responses from the teachers; theme one, use of technology and theme two, engagement of technology. Three comments caught the researcher’s attention that supports research question two:

Comment one: *“It is such a part of their lives outside of school that being knowledgeable about technology and making use of it during language therapy sessions is essential to getting buy in from my students. For many students on the Autism spectrum, this gives them a chance to show off what they know how to do online what they are strongest at. It allows me to see a different side of kid who is otherwise struggling academically and socially and gives them the opportunity to feel their skills and talents are valued”*

Comment two: *“Students are able to work at their pace when utilizing technology vs having to wait for those that might work at a slower pace than them.”*

Comment three: *“Technology allows students to practice the material in different ways. This is especially helpful for students who learn best by “doing” things rather than just hearing or seeing the information. Unfortunately, I share my bank of computers with three other teachers, so we do not get to use them as often as we would like, but technology is a helpful too!”*

Table 6 is a list of all the comments from the teachers who participated and illustrates the two themes.

Table 6: Teacher comments from survey.

Use of Technology
I have my own personal website that I use to post interactive online exercises and topical links. Thousands of links and exercises created over 15 years plus.
Students learn to use technology to help them listen to recordings. They compare and contrast the differences and similarities between recordings and also do recordings of their own to discuss strengths and weaknesses.
More practice opportunities, more input, reinforcement of class content, less papers to keep track of, 1 less book to carry around, immediate feedback from practice work, better visualizations of the world around them, connect virtually to places that are physically far away, hear pronunciations, more targeted/differentiated/individualized practice on what they need and/or are interested in.
Students benefit from the hands on approach of technology. They benefit from getting directions and instructions and models through the use of technology. They also benefit by having assignments available online if they are absent.
They use it outside of class for assignments.
It is such a part of their lives outside of school that being knowledgeable about technology and making use of it during language therapy sessions is essential to getting buy in from my students. For many kids on the Autism spectrum, this gives them a chance to show off what they know how to do online and what they are strongest at. It allows me to see a different side of a kid who is otherwise struggling academically and socially and gives them the opportunity to feel their skills and talents are valued.
Students are able to work at their pace when utilizing technology vs having to wait for those that might work at a slower pace than them.
Using technology to produce formative assessments for lessons, take their summative assessments, and an option for homework, as well as a way to contact me for help outside the classroom in privacy at their own pace.
Technology allows students to practice the material in different ways. This is especially helpful for student who learn best by "doing" things rather than just hearing or seeing the information. Unfortunately, I share my bank of computers with three other teachers, so we do not get to use them as often as we would like, but technology is a very helpful tool!
Engagement of Technology
Engaged by use of computer; students enjoy seeing data trends projected and discussed; students like competition aspect of digital games.
They are able to create multi-media presentations, type and house their writing assignments, have discussions online...
Technology in my classroom allows my students to access the curriculum in a way that is familiar to them.
Technology brings real-life application of curriculum into the classroom.
They seem to be more engaged and allows them to take responsibility for their own learning.
Increased engagement.
Interactive platform is engaging and applicable to real-world skills.

Research Question #3: “What educational technology support do students have at home to help overcome their reading disabilities?” To help answer research question three, data from the parent surveys (Appendix E) were compiled to create the below Table 7.

Table 7: Parent Survey Response

Parent Survey Responses					
Technology support students have at home and technology beliefs					
Q11	Not applicable	Strongly disagree	Disagree	Agree	Strongly agree
Technology is critical to the learning experience of students.	0%	0%	0%	20%	80%
Q12	Not applicable	Strongly disagree	Disagree	Agree	Strongly agree
Technology has been a great tool for my student's learning needs.	0%	0%	0%	66.7%	33.3%
Q15	Not applicable	Strongly disagree	Disagree	Agree	Strongly agree
My student is encouraged to use technology at school for school projects.	0%	0%	0%	40%	60%
Q17	Not applicable	Strongly disagree	Disagree	Agree	Strongly agree
My child frequently uses technology for homework.	0%	0%	0%	40%	60%
Q23	1	2	3	4	5
Among all needs facing schools today, where would you rank technology? (5 ranking the highest)	0%	0%	20%	40%	40%

Based on the Table 7 above, question 11 of the parent survey asked, “Technology is critical to the learning experience of students”, 80% strongly agree, 20% agree, 0% disagree, strongly disagree and not applicable. Question 12 of the parent survey asked, “Technology has been a great tool for my student’s learning needs.” 33.3% of parents strongly agree, 66.7% agree, 0% disagree, strongly disagree, and not applicable. Question 15, “My student is encouraged to use technology at school for school projects.” Parents responded that 60% strongly agree, 40% agree, and 0% disagree, strongly disagree, and not applicable. Question 17 surveyed the parents, “My child frequently uses technology for homework.” 60% of parents responded that they strongly agree, 40% agree, 0% disagree, strongly disagree and not applicable. Question 23 of the parent survey, “Among all needs facing school today, where would you rank technology (5 ranking the highest)?” Parents reported 40% a five as the highest ranking, 40% reported a four, 20% reported a two and none reported a one.

Finally, the last question of the survey, question 24, “*How does technology support your student with their learning needs?*” Parents reported the following:

Table 8: How does technology support your student with their learning needs?

How does technology support your student with their learning needs?

The world is changing everyday and for the school to include those changes I believe is great.
Access to school work and communications.
Student engagement
It supports my child's learning needs for research, writing and spelling.
Resources for research skills

As evidenced by the data collected, the middle school, teachers and parents have implemented and support a strong technology resource for students with reading disabilities. Through the encouragement of the school district, it’s evident that this school provides a strong professional development for teachers with technology resources and

training. This further substantiated while observing the sixth-grade class and being able to appreciate all the quality technology that this school provides, such as becoming a 1-to-1 laptop environment. Teachers have taken leadership opportunities by exploring what technology works and making them available to their students. It is most evident that the students and the parents both feel that technology has a huge roll in their education and future. Based on the responses from the surveys, all three groups, teachers, parents and students felt that technology has had an impact on their academic success and can be a useful tool to help support their learning needs.

Reading Test Results

According to Orcher (2014), a t-Test is widely used to test relating means and correlation coefficients. A t-Test with two samples is commonly used with small sample sizes, testing the difference between the samples when the variances of two normal distributors are not known.

The 2015-2016 Standardized Test for the Assessment of Reading (STAR); was used to measure the students who participated in the surveys reading scores of Fall of 2015 and Spring of 2016. Specifically looked for reading improvement from their Fall scores to Spring scores. The district administers the STAR Test to all students in grades 1-8. The student's performance data is available in real time and is used to adjust daily instructions. Overall scores can be generated along with specific reporting at the learning standard level. Results of these common assessments help drive continuous improvement efforts within the classroom, school, and district. The assessment takes 25 minutes for students to complete and is given to the students in the fall and spring to see if there is an improvement.

See Table 9 for the statistical analysis (t) used to determine (t) value of 1.6765 which was significant at the 0.05 level.

Table 9: t-Test for STAR Reading Test Scores.

t-Test: Paired Two Sample for Means		
	Fall 2015 Variable 1	Spring 2016 Variable 2
Mean	790.74	820.22
Variance	80854.15551	85661.11388
Observations	50	50
Pearson Correlation	0.981042317	
Hypothesized Mean Diff	0	
df	49	
t Stat	-3.670788224	
P(T<=t) one-tail	0.000298433	
t Critical one-tail	1.676550893	
P(T<=t) two-tail	0.000596865	
t Critical two-tail	2.009575237	

Variable 1 represents the student’s 2015 Fall reading scores and variable 2 represents the student’s Spring 2016 reading scores. For Variable 1 (Fall 2015) the lowest reading score was 177 with a percentile rank of 1% and the highest was 1346 with a percentile rank of 99%. For variable 2 (Spring 2016) the lowest reading score was 254 with a percentile rank of 2% and the highest was 1343 with a percentile rank of 99%. Variable 1 (Fall scores) shows a mean of 790.74 for the Fall scores and Variable 2 (Spring scores) shows a mean of 820.22 for the student’s reading scores. Resulting in an increase in reading scores for students in the spring assessment time. The findings from the reading scores from Fall of 2015 to spring 2016 indicates a small increase in student’s reading scores. The interpretation, implications, conclusions and recommendations for further study will be presented in chapter five.

Chapter Conclusion

Further discussion and analysis of the results will be presented in Chapter five, that includes a summary of the findings, limitations of the study. In addition to implications and recommendations for future research will be included. The researcher will conclude with a personal reflection that is relevant to this study. This chapter presented the findings from all three surveys, reading test scores from students who participated in the study, classroom observation, and the school's educational technology assessment program. Analyses of the findings indicates that technology can be a useful method in the support of students with reading disabilities. The interpretation of the findings, conclusions and recommendations for further study is presented in chapter five.

CHAPTER FIVE: SUMMARY CONCLUSION AND RECOMMENDATIONS

Results of this study offers a look at how technology supports students with reading disabilities. This research concentrated on one middle school with the participation of sixth-grade students, teachers, and parents and collected thorough analysis of surveys regarding the use of technology as a support tool for students with reading disabilities. Chapter five presents an overview of the research including a comprehensive summary of the findings as they relate to the research questions, the study's limitations, implications, recommendations for future research and researchers' reflections.

According to Glatthorn, Boschee F., Whitehead, Boschee B., (2012) there is increasing evidence showing when technology is executed correctly, it can have a substantial impact on student achievement. The data collected for this study is similar to results found by, Guthrie and Davis (2003) who noticed a relationship between technology, curriculum and learning by using real world experiences and personal interaction to connect students to technology and reading. There are some academic benefits that technology can enhance problem-solving skills, writing processes, content and higher order thinking skills. From the data collected, two themes emerged from all three survey responses: the use of technology and purpose of technology. In addition, the data responses showed how the use of technology provided enhanced learning and how the purpose of technology can support different individual learning styles of students with learning disabilities.

Findings and Conclusion

A detailed description of the data analysis, the results of the study and themes were presented in Chapter four. Through this quantitative and descriptive analysis, two themes were generated by this research. With the use of the surveys that were taken by the participants, the researcher found two themes related to the research questions and literature review. Even though a majority of the results had positive feedback the researcher recommends future research.

Theme 1: Use of Technology. *Research question # 1:* “How does the use of technology support the academic achievement of sixth-grade students with reading disabilities?” According to fifty students with some type of learning disability who participated in this research study, 91% expressed technology was very important to learning and having access to technology, they stated they learned better from the use of technology. Ninety-four percent of the students who took the survey questions specified that technology is important to their learning experience (survey question # 11 Appendix G). This result is similar to what was found in the literature. According to Glatthorn et al., 2012, research stated several beneficial outcomes when a relationship is established between technology, curriculum, and learning. Some of the academic benefits that technology can have are enhanced problem-solving skills, writing processes, content, and higher-order thinking skills (Gulek and Hakan, 2005). According to Gagnon, Hughes, Maccini, 2002, there are new methods to enhance students’ reading skills through the use of technology-based practices. Some use of technology expressed by teachers was 1-to-1 laptop environment, Google Education along with Google Apps, which provided an interactive approach to learning and collaborative learning with classmates and teachers.

Technology can meet the instructional needs of individual students in different ways based on each student's needs.

The 2015-2016 Standardized Test for the Assessment of Reading (STAR), measured the students reading scores during Fall of 2015 and Spring of 2016. During Fall of 2015, the STAR test was administered to the students in September of 2015 and then administered to students in Spring of 2016 in April of 2016. When comparing the mean of student's results from the STAR test, the mean for Fall and Spring, reported a small increase in the student's score. Variable 1 (Fall scores) reported a mean of 790.74 and Variable 2 (Spring scores) showed a mean of 820.22 for the student's reading scores, thus in an increase in reading scores for students. Studies suggest that students with reading disabilities can learn how to compensate for their disabilities (Raskind, 2000). Because of this, it is suggested that there is a need for further investigation into the student's reading scores, looking to see if there is continuous reading improvement and how technology might enhance achievement.

Research question #2: "What educational technology do teachers use in the classroom?" According to 30 participating teachers, the most used technology teachers reported using was Quizlet, Google Docs, You Tube, Khan Academy, Wordle, Ted Ed, Google Education, QR Codes, and Prezi. Teachers reported some use of, Social learning (EdModo, Pinterest, Twitter, Etc.) Dropbox, iPads, and SlideShare. The least used technology tools that teachers reported 0% for Fun Brain, Animoto, Diigo, Popplet and Evernote.

Nearly thirty-seven percent of the teachers reported strong agreement that technology has improved the effectiveness of their classroom, 46.7% agreed, 16.7% were

neutral and 0% disagreed. When teachers were asked how do students benefit from technology in their classroom? Teachers reported that technology allows students to practice the material in different ways and is helpful for students who learn best by “doing” things rather than just hearing or seeing. Students are able to work at their own pace when utilizing technology vs. having to wait for those that might work at a slower pace. These results are similar to what was found in the literature. According to Glatthorn et al. (2012), technology can not only improve student achievement, but it can also create an enriched technological society that the student needs in order to impact students learning. The research showed that the use of technology can increase student’s writing skills (Gulek and Hakan, 2005). Research finds that effective teachers are the primary success of student’s achievement (Goe, 2007).

Theme 2: Purpose of Technology. *Research question #3:* “What educational technology support do students have at home to help overcome their reading disabilities?” One hundred per cent of surveyed parents strongly agree that “technology has been a great tool for my student’s learning needs.” From the parent’s survey, 60% parents strongly agree that their students are encouraged to use technology at school for school projects, while, 40% agree, and 0% disagree, strongly disagree, and not applicable. Question 17 surveyed the parents, “My child frequently uses technology for homework.” One hundred percent of the parents agree. Forty percent of parents ranked technology a high need for their student’s education today.

Parents reported that technology does support their student’s learning needs, that the world is ever-changing, technology creates student engagement in the classroom, and technology supports their child’s learning needs for research, writing, and spelling.

Technology helps with resources such as research skills. Ways to engage students through technology based practices, use of computer or video-based multimedia program or technology-based assessments (Gagnon, Hughes, Maccini, 2002). Parents reported through the survey that the world is changing, and technology in education provides students with endless opportunities for technical literacy, information literacy, the capacity for lifelong learning and prepares students for 21st century skills (Gagnon, Hughes, Maccini, 2002). It is evident to the parents that technology is a support tool for their child's learning needs. The literature shows that technology is a supportive tool and enhances student achievement (Gulek and Hakan, 2005). According to classroom observation, when implemented correctly, technology in the classroom can be a support system for students with reading disabilities. Technology provides new resources for means of obtaining unlimited information, for example Internet use, enables sharing and collaboration among teachers and peers (Peterson-Karlan, 2011). Incorporating more assistive technology tools or software can improve or support students reading disabilities, such as using audiobooks, voice thread, and speech synthesizers/screen readers (Stanberry, 2015).

Discussion

This quantitative and descriptive research study revealed that technology is a support tool to students with reading disabilities to all learning needs and their future. After examining a middle school's technology and surveying the teachers, parents, and students, it was concluded that technology provides a large support of the student's learning needs. Student's learning needs can range based on the type of learner they are, such as, visual, auditory, verbal or physical. With this variety of learning styles, technology can address learning needs that individual teachers cannot. Students can interact with technology at

their own pace, review lessons and material at their own time to enhance understanding and memory. Computer-based tools can assist students to develop visual, kinesthetic, aural and oral skills. Physically disabled students can benefit from assistive technology and be able to participate with their peers (Whittenberger, 2013).

This district and middle school that was researched became a 1-to-1 laptop environment and selected Chromebooks because of their ability to meet the educational needs of their students and the integration with Google Apps for Education. With the use of Chromebooks, students have the increased experience to access a wide range of educational resources and have the opportunities to collaborate with their teachers and peers. Through using Chromebooks, students solve problems and develop problem-solving skills. By becoming a 1-to-1 program, this technology opens doors to enhance student learning by helping students become active thinkers and engaged in their learning as well as using this tool as a resource for their learning needs.

The findings from this study supported that technology can support students with reading disabilities. The district, teachers, and parents have made a strong commitment to technology use as a tool for their student's needs.

With the high demands of technology in the classroom, there can be one negative impact on students and technology. Not every student or household may have the access to technology. Some school districts and parents can fall into this issue. The "digital divide" is the gap between those who have ready access to technology products and services and those who do not have access to these items. Digital divide is an interaction between human and computers. The ability to access computers and the Internet has become completely important to our society. Parents and students need to have access to the Internet to check

grades and homework assignments.

However, not everyone has access to such luxury. This idea of Digital Divide refers to the underprivileged society, rural, elderly and handicapped population. While the wealthy, middle-class and young Americans living in areas, such as urban and suburban areas all have access to these tools. According to new figures released by the International Telecommunication Union (ITU), little more than 4 in 10 individuals around the world have Internet access in 2015. Currently, research shows the higher the household income more technology access and products a home may have. Lower income homes are not providing Internet access or technology products in the home. According to the Census 2013, majority of the households who have access to Internet and technology, these homes have very well educated individuals who hold college degrees. And finally, the Census 2013 reported that Hispanic, black and Native American households adopted the Internet more than white households. It's very clear that a more educated society would have access to such items as technology. But how can we help with the digital divide in the 21st-Century society? There are various ways to help with Digital Divide, communities, and public sectors can take a large part in helping with Digital Divide. Internet Service Providers can help with the lower cost to low-income families or lower basic phone services that provide Internet access through mobile devices. More community access throughout the public community, possibly government-funded programs to all free public Wi-Fi. The Obama administration realized how important it is to help stop Digital Divide. The administration has started the ConnectHome program to help Americans find ways to have access to help create better opportunities for Americans.

Recommendations

It is recommended that further research on parent involvement with the use of technology in the classroom be undertaken. Further an enlarged parent input by having more parents take the survey would deepen the understanding. The district could offer more support or parent workshops for the parents on ways to use technology at home. It is recommended that research be conducted in additional middle schools in the same district to broaden the scope of perspectives. The study could have a higher parent participation rate if the surveys were given out to more middle schools within the district. Furthermore, it is recommended to do a comparative study with other nearby districts to see if the observed results can be more broadly interpreted.

Implications

Insights into technology and how successful technology can be in helping students with reading disabilities has been gained. Technology is a tool and resource that is clearly supported by this district, teachers, students and parents. Starting the Fall of 2017, one of the four high schools in this district will open a new STEM lab. The district has built a \$5 million STEM wing that will focus on science, technology, engineering, and mathematics. The new STEM lab includes more than 16,000 square feet of STEM opportunities for the students. The lab will create a purpose of giving students access to state-of-the-art resources and technology. The new STEM lab will help the district's teachers with an inquiry-based model of instruction, creating questions, problems or scenarios, rather than facts. This new STEM lab will create more critical thinking, research and problem-solving. Not only at the high school level, but also at the elementary level. The elementary schools in this district created a STEM family night getting everyone in the family the opportunity

to participate in a STEM activity. The district is also incorporating a STEM learning space in all elementary school to support science, technology, engineering and mathematics in their curriculum. The new STEM learning opportunity will become a K-5 classroom that will be innovated and collaborative space that will be equipped with Robotics, computer programming, and 3D Design.

Chapter Conclusion

The purpose of this study was to analyze data that was collected through surveys and observation of what technology is being utilized in the classroom as a tool for a resource for students with reading disabilities. Demonstrated in the literature, education has shifted from a traditional instruction approach to a more modern approach with the use of technology (Schenk, 2010). Technology has enhanced the lives of students in many ways, such as how they communicate and learn. Technology in education provides students with the opportunities in such ways as information, resources and collaboration, all while it is preparing students for the future. The findings in this study suggest that the use of technology we can enhance a student's academic achievement. The intent of this study is to find the support that is needed to encourage the use of technology as an important tool to enhance student learning. The researcher believes through this study, the role of technology can support diverse student learning needs and will provide a basis for continued future studies.

Personal Reflection

This study has been an amazing journey that greatly impacted the researcher, who had the pleasure of working with an amazing school district and the opportunity of observing the daily struggles of students with reading disabilities. The researcher was

amazed to see a strong support system through the district, teachers and at home, on how important technology is to student's academic success. This journey was a personal adventure to the researcher. I am an educator and also a parent to a daughter who has a reading disability. Through the use of technology, my daughter has made significant strides in her education all because technology has been used as a tool for her learning success. My daughter uses technology as a resource in such ways as a personal laptop to use for research, writing, online textbooks that can be read to the student and voice thread. My daughter uses different apps to help with writing and spelling skills, such as Pronounce App. Pronounce app allows a person to type or speak into the app to help with pronouncing a word or be used to help spell a word. My daughter has used technology as a tool to help improve her academic achievements. I am not suggesting that technology is a cure for learning disabilities, but a tool to help students overcome reading disabilities. I will always and continue to be an advocate for teachers and students through the support of technology in the classroom.

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Appendix A

Parent Approval Letter

September 1, 2016

Dear Parent,

I am writing to ask your permission for your child to participate in an online survey through the University of Missouri-St. Louis research project; on how the use of technology can support student's academic achievement with reading disabilities. I am an educator who is interested in reading disabilities and how the use of technology can help support children in their academic achievement. I would like to ask for your approval of your student and your participation in a short research study for completion of my Doctorate in Education degree and my dissertation research.

The purpose of this study is to learn what technologies you use in your home and your opinion about these technologies. All children's responses are considered confidential, and children's results will not be shared with school staff, only the researcher. Only children who have parental permission, and who themselves agree to participate, will be involved in the study. There are no known or anticipated risks to participation in this study.

Participation involves completing a brief online survey (5-10 minutes). Once the the online survey is complete, the results will come to me, the researcher. Your name and your child's name WILL NOT appear on any record or CAN NOT be identified.

If you have any questions about this study, please feel free to contact me at 314-623-2703 or jrb219@umsl.edu.

I thank you for your help in this research.

Sincerely,

Jaime R. Ball-Inman, University of Missouri St. Louis
EdD Doctoral Student

Parent Signature for Approval

Date

Appendix B



jrb219@umsl.edu

354 Panhurst Ct.
Ballwin, MO, 63021
Cell: 314-623-2703
E-mail:

Informed Consent for Participation in Research Activities

Exploring the use of Technology to Support the Literacy of Middle School Students with Reading Disabilities.

Participant Teacher Name: _____

Principal Investigator: Jaime R. Ball-Inman
623-2703

PI's Phone Number: 314-

-
1. You are invited to participate in a research study conducted by Jaime R. Ball-Inman and under the supervision of Dr. Gayle Wilkinson. The purpose of this research is to investigate how teachers use technology for students with reading disabilities.
 2. Your participation will involve:
 - a. An online survey that will be sent to you via email.

Approximately, a range of 20-35 teachers may be involved in this research.
 - b. The amount of time involved in your participation will be approximately 15-20 minutes for the survey.
 3. There are no anticipated risks associated with this research.
 4. There are no direct benefits for you participating in this study. However, your participation will contribute to the understanding of effective strategies about the use of technology and student academic achievement.
 5. Your participation is voluntary and you may choose not to participate in this research study or to withdraw your consent at any time. If you want to withdraw from the study, you can contact me at 314-623-2703 or jrb219@umsl.edu. You may choose not to answer any questions that you do not want to answer. You will NOT be penalized in any way should you choose not to participate or to withdraw.

6. By agreeing to participate, you understand and agree that your data may be shared with our researchers and educators in the form of presentations and/or publications. In all cases, your identity will not be revealed. In rare instances, a researcher's study must undergo an audit or program evaluation by an oversight agency (such as the Office for Human Research Protection). That agency would be required to maintain the confidentiality of your data. In addition, all data will be stored on a password-protected computer and/or in a locked office.
7. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, Dr. Wilkinson at 314-516-5951. You may also ask questions or state concerns regarding your rights as a research participant to the Office of Research Administration, at 314-516-6759.

I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. I consent to my participation in the research described above.

Participant's Signature Date

Participant's Printed Name

Signature of Investigator or Designee Date

Investigator/Designee Printed Name



Appendix C

354 Panhurst Ct.
Ballwin, MO, 63021
Cell: 314-623-2703
E-mail:

jrb219@umsl.edu

Informed Consent for Participation in Research Activities

Exploring the use of Technology to Support the Literacy of Middle School Students with Reading Disabilities.

Participant Parent Name: _____

Principal Investigator: Jaime R. Ball-Inman
623-2703

PI's Phone Number: 314-

-
1. You are invited to participate in a research study conducted by Jaime R. Ball-Inman and under the supervision of Dr. Gayle Wilkinson. The purpose of this research is to investigate parent knowledge and use of technology for students with reading disabilities.
 2. Your participation will involve:
 - a. An online survey that will be sent to you via email.

Approximately, a range of 20-35 parents may be involved in this research.
 - b. The amount of time involved in your participation will be approximately 15-20 minutes for the survey.
 3. There are no anticipated risks associated with this research.
 4. There are no direct benefits for you participating in this study. However, your participation will contribute to the understanding of effective strategies about the use of technology and student academic achievement.
 5. Your participation is voluntary and you may choose not to participate in this research study or to withdraw your consent at any time. If you want to withdraw from the study, you can contact me at 314-623-2703 or jrb219@umsl.edu. You may choose not to answer any questions that you do not want to answer. You will NOT be penalized in any way should you choose not to participate or to withdraw.

6. By agreeing to participate, you understand and agree that your data may be shared with our researchers and educators in the form of presentations and/or publications. In all cases, your identity will not be revealed. In rare instances, a researcher's study must undergo an audit or program evaluation by an oversight agency (such as the Office for Human Research Protection). That agency would be required to maintain the confidentiality of your data. In addition, all data will be stored on a password-protected computer and/or in a locked office.

7. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, Dr. Wilkinson at 314-516-5951. You may also ask questions or state concerns regarding your rights as a research participant to the Office of Research Administration, at 314-516-6759.

I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. I consent to my participation in the research described above.

Participant's Signature Date

Participant's Printed Name

Signature of Investigator or Designee Date

Investigator/Designee Printed Name

Appendix D



jrb219@umsl.edu

354 Panhurst
Ct.
Ballwin, MO, 63021
Cell: 314-623-2703
E-mail:

Assent to Participate in Research Activities (Minors)

Exploring the use of Technology to Support the Literacy of Middle School Students with Reading Disabilities.

My name is Jaime Inman, a fulltime doctoral student at University of Missouri – St. Louis who is working on a Doctor of Education degree in Curriculum and Instruction and doing research on the Exploring the use of Technology to Support the Literacy of Middle School Students with Reading Disabilities. I am asking you to take part in a research study in the areas of reading and the use of technology as a tool.

If you decide to participate, you will take an online survey that will be given to you in class, that will take approximately 15-20 minutes. The surveys will be kept with researcher, and will be discarded as soon as the study is over. Being in this study will not be of any personal or professional risk to you in any way.

If you choose not to be in this study, you don't have to participate. Remember, being in this study is up to you, and no one will be upset if you don't want to participate in, or if you change your mind later and want to stop.

Signing your name at the bottom means that you agree to be in this study. You will be given a copy of this form after you have signed it. The results will be shared through publication and presentations without identifying you individually.

Participant's Signature

Date

Participant's Printed Name

Participant's Age

Grade in School

Appendix E Parent Technology Survey

Directions: Please take the time to respond to the survey questions frankly and truthfully. It is critical that you complete all answers before submitting. Your answers are electronically anonymous and will only be used in combination with other responses. Thank you for your time.

1 . My student is the following grade level: (If you have more than one student, you may answer more than one level or take the survey again for each student.) *Check all that apply.*

- K-3
- 4 - 5
- 6 - 8
- 9 - 12

2. I have a home computer. *Mark only one oval.*

- YES
- NO

3 . I have Internet access at home. *Mark only one oval.*

- YES
- NO

4 . I have a mobile device with Internet access. *Mark only one oval.*

- YES
- NO

5 . My student has a mobile device with Internet access. *Mark only one oval.*

- YES
- NO

6. Does your student have a personal e-mail account for school? *Mark only one oval.*

- YES
- NO

7 . I use a computer for work. *Mark only one oval.*

YES

NO

8 . I have good computer skills. *Mark only one oval.*

Not applicable

Strongly disagree

Disagree

Agree

Strongly agree

9 . I am comfortable learning and working with new technologies. *Mark only one oval.*

Not applicable

Strongly disagree

Disagree

Agree

Strongly Agree

10. I have good overall knowledge of technology.

Mark only one oval.

Not applicable

Strongly disagree

Disagree

Agree

Strongly Agree

11. Technology is critical to the learning experience of students. *Mark only one oval.*

Not applicable

Strongly disagree

Disagree

Agree

Strongly Agree

12. Technology has been a great tool for my student's learning needs. *Mark only one oval.*

- Not applicable
- Strongly disagree
- Disagree
- Agree
- Strongly Agree

13 . My student's access to technology in school is currently regular and adequate. *Mark only one oval.*

- Not applicable
- Strongly disagree
- Disagree
- Agree
- Strongly agree

14 . My student has strong technology skills. *Mark only one oval.*

- Not applicable
- Strongly disagree
- Disagree
- Agree
- Strongly agree

15 . My student is encouraged to use technology at school for school projects. *Mark only one oval.*

- Not applicable
- Strongly disagree
- Disagree
- Agree
- Strongly agree

16 . My student has access to a computer outside of school for school work. *Mark only one oval.*

- Not applicable
- Strongly disagree
- Disagree
- Agree
- Strongly agree

17 . My child frequently uses technology for homework. *Mark only one oval.*

- Not applicable
- Strongly disagree
- Disagree
- Agree
- Strongly agree

18 . I assist my child in using a computer for school projects. *Mark only one oval.*

- Not applicable
- Strongly disagree
- Disagree
- Agree
- Strongly agree

19. My child plays games on a home computer. *Mark only one oval.*

- Not applicable
- Strongly disagree
- Disagree
- Agree
- Strongly agree

20 . My child has a personal social networking site (e.g. Facebook/Instagram, etc.). *Mark only one oval.*

- Not applicable
- Strongly disagree
- Disagree
- Agree
- Strongly agree

21 .The school offers technology classes for parents. *Mark only one oval.*

- Not applicable
- Strongly disagree
- Disagree
- Agree
- Strongly agree

22 . The school uses technology for communicating with our home and family (web pages, voice messaging, e-mail). *Mark only one oval.*

- Not applicable
- Strongly disagree
- Disagree
- Agree
- Strongly agree

23. Among all needs facing schools today, where would you rank technology? *Mark only one oval.*

	1	2	3	4	5	
Low	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	High

24. How does technology support your student with their learning needs?

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 Google Forms

Appendix F-Teacher Technology Survey

Directions: Please take the time to respond to the survey questions frankly and truthfully. It is critical that you complete all answers before submitting. Your answers are electronically anonymous and will only be used in combination with other responses. Thank you for your time.

Teacher Background Information

Please answer the following questions about your teacher background.

1. What grades are you teaching this year?

- Check all that apply.
- Kindergarten
- Grade 1
- Grade 2
- Grade 3
- Grade 4
- Grade 5
- Grade 6
- Grade 7
- Grade 8
-

2. Including the current year, how many years of teaching experience do you have?

Mark only one oval.

- 1 year or less
- 2-5 years
- 6-12 years
- 13-20 years
- 21+ years

3. What subject(s) are you teaching this year? Check all that apply.
- Self-Contained Elementary
 - Subject specific Elementary
 - Self-Contained Middle School
 - Elementary Reading
 - Middle School Reading
 - Middle School Math
 - Middle School Social Studies
 - Middle School Science
 - Middle School Language Arts
 - Special School District or Special Needs Teacher
 - Other (Art, Technology, Foreign Language, PE, FACS, Drama, etc)
 - Other:
 - _____
 -

4. Which of the following technology tools do you use to build mastery of your academic content? (Check all that apply.)
- Check all that apply.
 - Word Processing (Word or Google Docs)
 - Spreadsheets (Excel or Google Sheets)
 - Presentations (PowerPoint or Google Slides)
 - Desktop Publishing
 - Content specific simulation software for students to interactively make decisions and see consequences
 - Tutorials for self-paced learning
 - Use of the Internet for the instructional activities listed above
 - Use of the Internet as a digital reference for research
 - Web page authoring
 - Video distance learning
 - Concept Mapping
 - Technical design
 - Multimedia
 - Google Classroom
 -
 -

5. How many computers are available for student use in your classroom?

Check all that apply.

- 1-5
- 5-10
- 10-15
- 15-20
- 20 +

6. What other technology tools, if any, do you have your students use? (Check all that apply.) Check all that apply.

- Social Learning (Edmodo, EduBlogs, Skype, Wikispaces, Pinterest, Twitter)
- Khan Academy
- FunBrain
- Animoto
- Wordle
- QR Codes
- Quizlet
- Google Docs
- YouTube
- Ted-Ed
- Evernote
- Google Education
- Dropbox
- Diigo
- Apple iPad
- Popplet
- SlideShare
- Prezi
- Other:
- _____
-

7. Has technology improved the effectiveness of your classroom? Mark only one oval.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

8. What is the primary obstacle you face when utilizing technology in the classroom? (Check all that apply.) Check all that apply.

- No technology in the classroom
- No support in teacher training
- Not enough time to incorporate technology in the classroom
- I don't feel it's important to utilize technology in the classroom

Teacher Technology Use

9. Check all that apply, do you use technology to do the following? Check all that apply.
- Manage student information
 - Examine student performance trends in order to plan instruction
 - Administer assessments
 - Create lesson plans
 - Develop instructional content and activities
 - Support standards-based instructions
 - Communicate with parents
 - Communicate with students
 - Post class-related information using online tools (Moodle, Blackboard, Google Apps, etc)
 - Support instruction with video distance learning
 - Access digital video for classroom instruction
 -

10. Which of the following technologies would like to have integrated within your classroom? (Check all that apply.) Check all that apply.

- Computing: Laptops/netbooks
- Computing: iPads/Kindle/eReader/Nook
- Computing: Clickers/Student response systems
- Class website
- E-Portfolio tools

- Smartboard
- Learning Management System
- Online Courses
- Instructional online gaming
- Interactive virtual words
- Google Classroom
- Google Apps
- Other:
-
-

11. Does your school provide the following for your use? (Check all that apply.)
Check all that apply.
- Laptop/Netbook
 - Desktop for students
 - Desktop for teacher
 - Media players
 - Smartphone
 - iPads
 - Web 2.0 tools for planning
 - E-mail account for students
 - E-mail for teachers
 - Google Classroom
 - Google
 - Apps
 - Other:

12. Is a computer with Internet access available to you during your off-school time? Mark only one oval.

- YES
- No

13. Please indicate if you need professional development in any of these areas.

- (Check all that apply.)
- Word Processing (Word or Google Docs)
- Spreadsheets (Excel or Google Sheets
(PowerPoint or Google Slides)
- Desktop Publishing
- Content specific simulation software for students to interactively make decisions and see consequences
- Tutorials for self-paced learning
- Use of Internet for the Instructional activities listed above
- Use of Internet as a digital reference for research
- Web page authoring
- Video distance learning
- Concept mapping
- Technical design
- Multimedia
- Google Classroom
- None needed
-
-
-

Technology Leadership

14. How would you rate your principal in terms of his or her role supporting educational technology? (Check all that apply.)

- Being a leader for educational technology
- Encouraging me to use technology in my classroom
- Providing sufficient professional development opportunities to build my capacity to use technology in the classroom

Technology Beliefs

15. How would you describe your beliefs regarding educational technology? (Check all that apply.)

- I believe technology functions as an effective tool for helping students master the state academic content standards.
- I believe the use of technology makes the process of learning more interesting for students.
- I believe technology improves the effectiveness of my teaching (makes my job more interesting).

Digital Learning and Web 2.0

16. How often do you access digital media content online?

- Mark only one oval.
- Never
- At least once per year
- At least once per month
- At least once per week
- Daily

17. How often do your students manage digital media content in the classroom?

- Mark only one oval.
- Never
- At least once per year
- At least once per month
- At least once per week
- Daily

18. Do you have access to district-provided Web 2.0 tools for your classroom? (blogs, tagging, social bookmarking, pod-casting RSS feeds, or wikis). Mark only one oval.

- YES
- NO

19. What technologies do you use to post lessons and activities for your classroom? (Check all that apply.) Check all that apply.

- Learning Management System
- Short message services SMS (text messages)
- Teacher web page
- Blog
- Wiki
- Podcasting
- E-mail
- Google Classroom
- Other:
- _____

20. What skill level best expresses your understanding and use of Web 2.0 tools (blogs, tagging, social bookmarking, pod-casting, RSS feeds, wikis)?

Mark only one oval.

-
- Very Low
- Low
- Moderate
- High
- Very High

Technology Support

21. When your classroom technology does not work, who provides technical support?

- Check all that apply.
- Technology coordinator or technician
- Student
- Another teacher
- Myself
- Parent
- Community member
- Contracted IT
- Does not apply to me
- Other:
- _____

22. How do students benefit from technology in your classroom?

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Appendix G-Student Survey

Directions: Please take the time to respond to the survey questions frankly and truthfully. It is critical that you complete all answers before submitting. Your answers are electronically anonymous and will only be used in combination with other responses.

1. What is your current grade? Mark only one oval.

- K-5
- 6-8
- 9-12

2. How often do you use a computer in school? Mark only one oval.

- Daily
- Weekly
- Often
- Sometimes
- Not very often
- Never
-

3. How often does your teacher use technology for classroom instruction, such as a computer/iPad and projector, etc. Mark only one oval.

- Daily
- Weekly
- Often
- Sometimes
- Not very often
- Never
-

4. How important to your learning do you feel having access to technology is (do you learn better from the use of technology)? Mark only one oval.

- Very important
- Pretty important
- Not very important
- Not important at all

5. What do you use computers for the most in the classroom? (Check all that apply.)

- Internet
- Research
- Writing paper
- Learning materials
- Watching videos
- Playing games
-

6. What technology do you learn from the best in the classroom (media center/PC lab)?

(Check all that apply.)

- A computer you are using
- A computer and projector that a teacher is using
- A smartboard that both the teacher and student are using
- My personal iPhone/iPad/other

7. What technology would you like to have in your classroom or have more access to? Mark only one oval.

- Desktop computer
- Laptop computer
- iPad
- Smartboard

8. What type of technology do you have at home (all devices)? (Check all that apply.)

- Desktop computer
- Laptop computer
- iPad
- iPhone/cell phone
- HD TV
- Internet
- Cable/Satellite/Uverse
-

9. From this list how many technology devices are available to you? (Desktop computer, laptop, iPad, iPhone/cell phone, HD TV, Internet.) Mark only one oval.

-
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 9
- 10
- 11 +
-

10. What is the device you feel you learn the most using?

Mark only one oval.

- Desktop computer
- Laptop computer
- iPad
- iPhone/cell phone
- Other:

11. Technology is important to my learning experience. Mark only one oval.

- Strongly agree
- Agree
- Disagree
- Strongly disagree
- No opinion

**Appendix H
Observation Matrix**

Observations	Core concepts behind observations	Transferable Ideas
District Wide Google Education/Google Classrooms	Students uses only Google Education to view and complete assignments. Every class a student has is created in Google Classroom.	Access assignments anywhere at home or school, collaboration with classmates and teachers. Parents have access to all of the class assignments, quizzes etc. all in one location. Provides access to teacher's lecture notes and study guides. Can be easily printed if a student needs to have access to hard print copies.
Online Writing Journals Using Google Docs	Online writing journals in each class.	Helps students who need to type out journals and has access to spelling correctly or voice typing for struggling writers.
Online Google Forms Quizzes	All quizzes are taken through Google forms in all subjects.	
Voice Technology/Voice Typing	Speech recognition add on app.	Helps students to use speech recognition to write students Google Docs documents. Especially for students who have a written expression disability and have a hard time spelling.
Google Apps	Access to any google education application a student may need.	Access by laptops, Chromebooks or mobile phones.
1:1 Chromebooks through out all grades 6 th -8 th	Students have	
Online Textbooks for each class	Student have access to every textbook at school.	Student leaves textbooks home and only use online textbooks at school.