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Assistive reading technologies for struggling readers

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Link to Digital Story

Abstract

The purpose of this research study was to identify how assistive technologies can be used in the classroom to assist elementary students with reading disabilities. The intent of this study was targeted towards identifying and exploring the different types of available reading technologies, their benefits, as well as the potential drawbacks that they inflict. This research draws upon examining findings from various literature reviews which focused on the placement and the impacts that assistive technologies present to students with learning challenges. Additionally, interviews with experts in the fields of inclusive education, early literacy, technology, and English language learners were conducted to further these findings. A survey was sent out to inquire Mount Royal University teacher candidates, educational faculty, and various elementary school teachers regarding how they have seen technology used to assist readers. The results of this research study indicated that assistive reading technologies have the ability to propel readers to reach higher levels of success and self-efficacy, enable readers and nonreaders to engage with literature, increase comprehension, and decrease learning gaps

between students. These findings are significant and useful for current and emerging facilitators as they serve to provide an awareness of reading technologies that are available and the benefits that they present to readers. However, it is essential to recognize that not every reading tool will produce the same results for every child and that assistive reading technologies should not solely be relied upon by students or teachers.

Introduction

As society advances further and further into the twenty first century, the functions, advancements, and purposes for technology in everyday living do as well. The purpose of this research study was to investigate how assistive technologies can be used in the classroom to foster and assist elementary students exhibiting reading disabilities. I was most curious to explore the different types of available reading technologies and the benefits and challenges that they present.

Throughout my primary schooling and into my university education, I have had to adjust and adapt how I learn because of my reading disability. I possess a strong interest and passion learning about reading and comprehension disabilities, delayed development, inclusive education, and the available technological supports that help foster children who struggle. My interest in these areas stems primarily from my personal connection and familiarity regarding how it feels not to learn and read at the same rate or in the same way as my peers. Because of my personal understanding about the frustrations of taking longer than my peers to complete tasks, my struggle with reading comprehension, and other related challenges. I am confident that my experience and understanding will enable me to provide my students with tools to eliminate the struggles they face while also introducing assistive technologies to help foster their learning. I was not presented with assistive reading technology until high school and this setback makes

me wonder if my learning/education would have been improved, remained the same, or would have been negatively impacted had I had access to assistive reading technologies.

As an emerging and future elementary facilitator, I am aware that my students will enter my classes with diverse backgrounds, abilities and disabilities, ethnicities, strengths, and weaknesses. Therefore, I recognize the importance of being able to offer proper kinds of support for each student, while also keeping in mind that not all supportive reading technologies will be beneficial or produce the same results within all students.

Background

There has been much discussion amongst scholars and researchers regarding the use of assistive technologies to help facilitate students who struggle with reading disabilities. Many scholarly sources have discovered and concluded that assistive technologies act as effective resources that promote and strengthen students' comprehension, fluency, decoding skills and increase students' competencies and self-esteem.

As educators develop further into their profession, classrooms are becoming more diverse; the awareness and number of individuals diagnosed with learning and reading disabilities has also developed more rapidly (Ruffin, 2012). Fortunately, so has the availability of assistive technology tools. In order to be able to perceive the benefits that assistive technology can provide to individuals, specifically students with reading disabilities, it is important to understand what assistive technology means. According to the the Technology-Related Assistance for Individuals with Disabilities Act of 1988, as cited in Ruffin (2012), assistive technology (AT) is "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain or improve the functional capabilities of individuals with disabilities" (para. 4). Furthermore,

Stanberry (2010) suggested that assistive technologies for reading include programs, hardware, and devices that present text as speech serve to help text materials to be more accessible, better understood, help with decoding, and foster fluency. Therefore, AT reading tools are intended to strengthen reading abilities and competences of students. I believe understanding this definition is important because it identifies how numerous and prosperous the purposes are for supplying students with assistive technologies.

Marino (2009), discussed how cognitive technology tools integrated with the Universal Design for Learning (UDL) framework assisted students with reading disabilities. The results from Marino's study indicated a positive relationship between reading ability and comprehension in students who utilized assistive technology tools. Furthermore, Marino (2009) revealed that when the Universal Design for Learning (UDL) framework was paired with cognitive technology tools it enabled students with serious reading disabilities to perform at the same levels as their peers. The UDL framework, in relation to the use of assistive technology, was also explored and evaluated in the video *Assistive Technology: Powerful Solutions for Success (*2011). This video presented ideas about how to incorporate the Universal Design for Learning principles (UDL) in the classroom for students who struggled with various disabilities-- including reading difficulties. The video also revealed how using the UDL framework along with various assistive technologies afforded students with reading disabilities to become self-sufficient learners and improved their self-efficacies.

Sadly, students who struggle with reading often struggle with succeeding in and throughout school. There has been a significant amount of research conducted examining the outcomes that assistive technologies afford to those who struggle with reading and many of these studies have revealed positive results. Gonzalez (2014) described the beneficial effects that

computer assistive instructional technology, specifically interactive electronic books, had on the comprehension of elementary students with learning disabilities. Gonzalez's (2014) research revealed that when students with reading disabilities were provided with vocabulary supports and text-to-speech, it successfully increased their comprehension and ability to summarize what they had read/learned. Researchers also found that interactive features in eBooks acted as scaffolding tools to aid reading, fluency, engagement and comprehension which then translated to help students reach their zone of proximal development (ZDP) (Gonzalez, 2014).

While there have been many studies performed examining the effectiveness of assistive reading tools in the classroom, additional research regarding the available tools and programs that are being utilized by students has also been profoundly evaluated. In an article by Stanberry (2010), he provided information about the various types and accessibility to current assistive technology tools that can be used to cultivate reading and learning skills in students with reading disabilities. All of the assistive tools listed in Stanberry's article were those of which delivered the text as verbal speech in order to help students facilitate reading, understanding, fluency, and decoding. In his online article, Stanberry (2010) suggested that students who struggle with optical character recognition should consider programs such as *WYNN Literacy Software Solution, The Quicktionary Reading Pen, Read and Write Gold, Echo Smart Pen, Classmate Reader, Kurzweil,* and other like programs that convert text to speech. Programs and software resources *WYNN, Kurzweil 300,* and *Bookshare* were mentioned in the video *Assistive technology: Powerful Solutions for Success* (2011); this video also revealed how these assistive technologies helped students with disabilities to become self-sufficient learners and increase their competencies.

Finally, there are many benefits that assistive technologies offer to students with reading disabilities. As Ruffin (2010) points out in his article, AT act as empowering assistive tools, promotes independence and self- regulation, and decreases student reliance on others. With the above information in mind, it is obvious that the use of assistive technology does indeed help individuals reach their zone of proximal development, strengthen skills, and reduces the possible achievement gap between students.

Research Context

This study was conducted at Mount Royal University (MRU) for the purpose of an inquiry research project as a part of the Bachelor of Education program. I gathered my data from a variety of sources; these sources included a survey that I created using Google Forms which was centred upon and consisted of inquiry questions regarding reading disabilities and the use of technology. Participants of this survey were all over the age of eighteen and were kept anonymous to protect and insure their personal identities and security, but also to prevent any possible biases. Before beginning my survey, a disclaimer was presented to the survey participants explaining the purpose of my survey. This survey was sent out via social media and through email; it included fellow second year Bachelor of Education students, faculty, and professors from MRU, friends, family, colleagues, elementary and high school teachers. Prior to conducting this anonymous survey, I completed the Human Ethics Research and Human Ethic Tutorial which led my government approved certification to research. Via email I also contacted experts in the fields of reading, inclusive education, and early literacy to further my findings. Furthermore, I reached out and contacted academic strategists and elementary teachers from city and rural schools in Alberta. Lastly, I posted and provided my survey's results and final conclusions to inform my survey participants, experts, teachers, and advisors that participated in

providing information to enhance my research project.

Methods of Investigation

The specific methods of data collection that I used to conduct research about assistive technologies and reading disabilities included a qualitative approach using Google Form surveys, e-mail interviews, social media, field placement notes, verbal conversations, literature reviews, articles, and prior research.

The first collection of data that I gathered derived from a variety of literature reviews, online articles and blogs. The information from these sources provided me with a greater understanding about research that had previously been discovered regarding how assistive technology assists students with learning disabilities. Furthermore, the sources provided me with awareness about what needs further investigation.

Next, I created a Google Forms survey which I sent out through social media and e-mail; this means of investigation served to provide my research with a variety of experiences and views held by individuals that have used and/or have seen assistive technology utilized to help foster the learning of students with reading disabilities. From the survey results, I summarized my findings using spreadsheets and transferred them into graphs and visual charts to help easily identify and understand my survey outcomes.

Furthermore, I contacted experts in the fields of reading, inclusive education, and early literacy by e-mail to further my findings. From the information that I collected from experts, I was able to gain valuable insight which overlapped and shared commonality with previous research findings from various literature.

I organized my data in accordance to my main question regarding how assistive technologies can be used to foster and assist elementary students with reading disabilities. I then

continued to organize data by themes such as the different types of available reading technologies and the benefits/challenges that they present and inflict to users.

Findings

The research that I conducted and collected from surveys, interviews, literature, my field experience, and my personal experiences has revealed that there is an overwhelming abundance of available and easily accessible technology supports for students who struggle with reading. Furthermore, my findings have supplied me with a greater awareness and understanding discerning differing encounters and views regarding how assistive technologies can be used to foster and assist elementary students with reading disabilities. Furthermore, my discoveries broadened my knowledge about the various types of available reading technologies and their benefits and challenges.

In my Google Forms survey, participants were asked "what are the greatest challenges that assistive technologies present to students?" The results indicated that 75% of participants agreed that cost would be the greatest challenge. However, throughout my research process I discovered many free assistive literature tools on the internet such as *Read Please, Text to Speech, Word Talk,* etc.-- providing that students have access to computers. A greater public awareness needs to be brought to the programs that are of no cost.

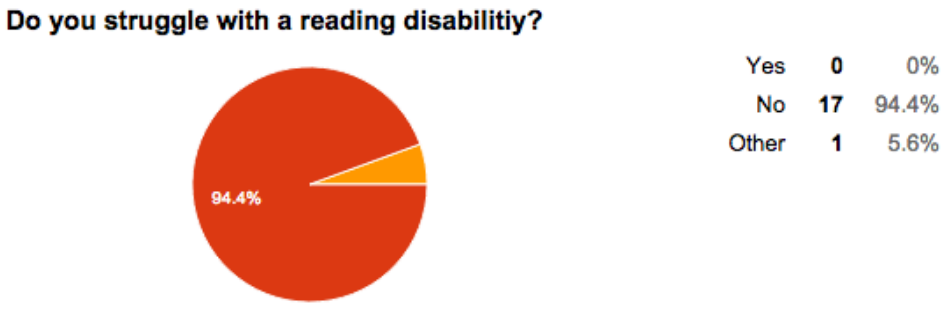
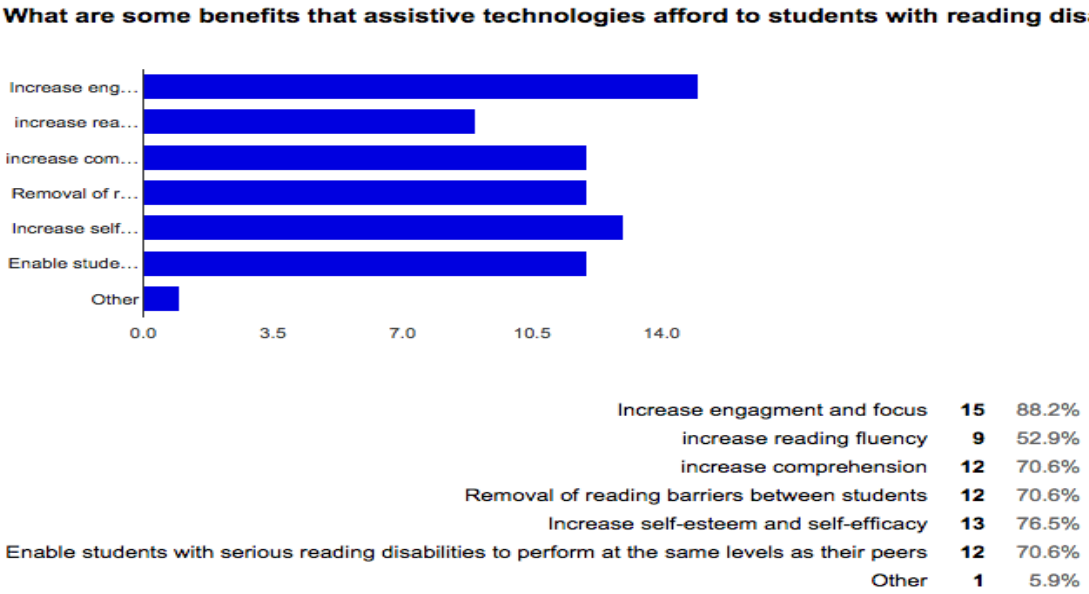


Figure 1. Demographic of Participants

Although the results from figure 1 indicated that no survey participants struggle with a reading disability, it did reveal that many pre-service teachers, educational assistants, faculty, and professors have an understanding about how technology can be used to assist students with



reading difficulties.

Figure 2. Advantages Technological Support Offers Readers

Figure 2 revealed the benefits that assistive technologies afford to students who struggle with reading. According to survey participants, digital technologies help to increase engagement, focus, self-esteem, self-efficacy, reading comprehension, and fluency within students with reading disabilities. The results from this question reinforce and overlap with previous research found within scholarly literature.

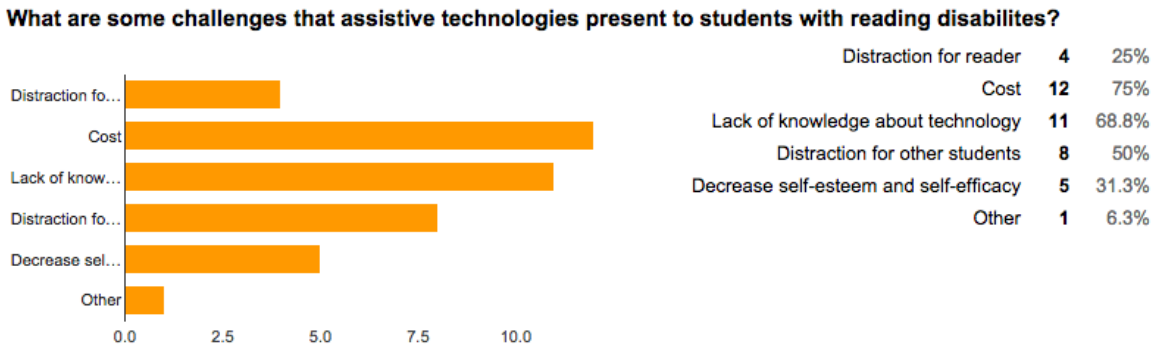


Figure 3. Challenges Technological Support Presents to Students With Reading Disabilities

Figure 3, revealed the challenges that technological support presents to students with reading disabilities. This figure indicates that the biggest challenges are cost, student and teacher lack of knowledge about technology use, and technology being a distraction to other students. It is important to consider and represent both the pros and cons as to prevent any imposed/prevalent biases as well as to serve as a starting point to identify changes that need to be implemented.

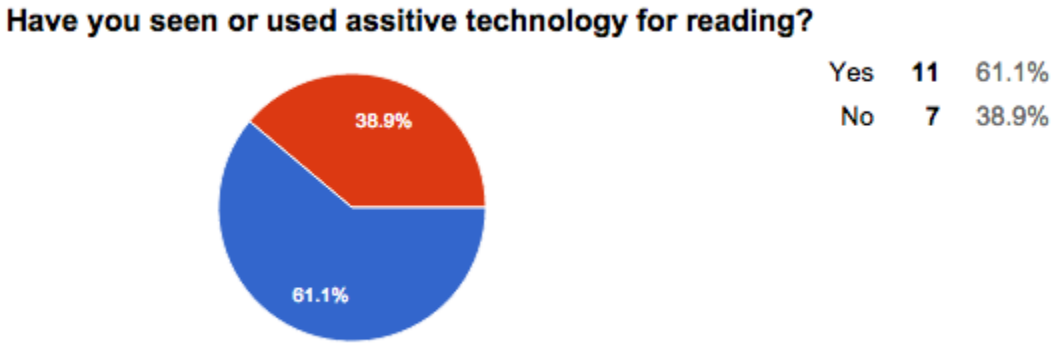


Figure 4. Awareness of Assistive Reading Technologies

Figure 4 revealed that 61% of participants have seen and/or have used assistive reading

technologies. It was important for my research to present my survey participants with the question “have you seen or used assistive technology for reading?” because I wanted to gain perspective and understanding as to the degree of awareness of the available reading technologies.

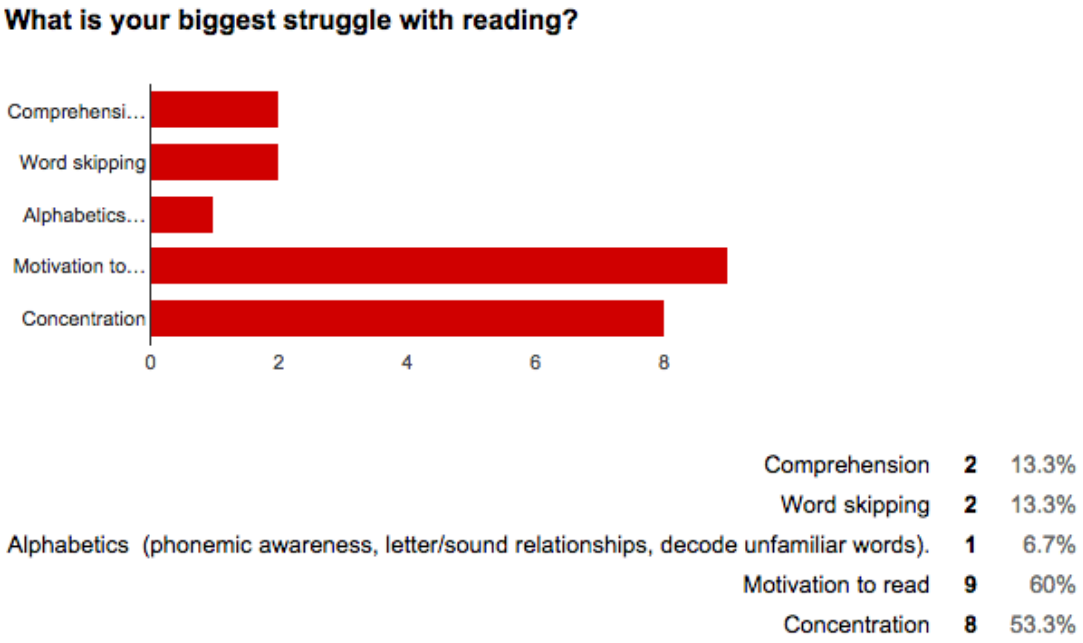


Figure 5. Reading Struggles

Figure 5 revealed that the greatest and most prevalent struggles survey participants encounter while reading. The results indicated that motivation to read and concentration were the primary struggles for individuals when reading. It was important to consider this information as I conducted my research because it allowed me to take into consideration the frequent and shared reading difficulties as I explored programs, software, and devices that support and assist readers with varying struggles.

In addition to the findings from my survey, I reached out and interviewed Jamie McEvoy who currently is a grade 1/2 teacher; Jamie’s masters degree focused on early literacy, technology, and English Language Learners. In inquiring Jamie about assistive reading

technologies and students who struggle with reading disabilities, she shared that assistive technologies which serve to enhance one's comprehension can change how students view themselves as learners and improve their self-esteem (J. McEvoy, personal communication, November 9, 2015). Jamie's comment acts in accordance with the findings in the video *Assistive Technology: Powerful Solutions for Success (*2011) and the results from my survey. Jamie discussed further how technology can improve students reading performance; she also informed me that her master's degree capstone was conducted around using Ipads in the classroom to improve early literacy skills in english language learners. Jamie McEvoy's literature review and her action research in the classroom indicated very strong evidence that Ipads increased student learning when "traditional instructional [was] augmented with apps that reinforce[d] early literacy concepts" (J. McEvoy, personal communication, November 9, 2015).

Furthermore, I also interviewed Paige Winfield, an elementary teacher at a local Calgary school. In discussing the potential advantages that assistive technologies present to students with reading disabilities Paige responded that she agreed that there are advantages such as technologies that "enable non-readers to engage with literature" but that "teachers should not allow their students to use it as a crutch. The answer, as with many other philosophic education questions, lies in the balance" (P. Winfield, personal communication, November 9, 2015). I strongly agree that balance is key. Although assistive reading technologies can be helpful, they should not solely be relied upon by students or assistive supports will become a crutch and not drive students to excel beyond their actual development and reach their zone of proximal development.

Conclusions and Recommendations

As Clay (2005) remarked, "If the child is a struggling reader or writer the conclusion

must be that we have not yet discovered the way to help them learn" (as cited in Hughes, 2015, p. 4). Overall, this research study has predominantly provided me with a greater awareness of the importance of recognizing that every child is unique and so should be their learning experiences. I have come to learn how assistive technology can pose as a foundation for those who struggle with reading and comprehension. Not every reading tool will produce the same results for every child; it will require trial and error to identify which programs work best for each learner. However, I have come to realize that it is my personal responsibility to enhance my awareness and knowledge of how to use various reading technologies. Assistive technologies, as you can recall from the above information, have the ability to take individuals, with and without disabilities, to a higher levels of success and self-efficacy. Assistive reading technologies enable readers and "non-readers to engage with literature" (P. Winfield, personal communication, November 9, 2015), increase their comprehension, confidence, self-esteem, and decrease the learning gap between students.

Going forward into my profession, I feel growth in my confidence due to my increased knowledge and awareness about the abundance of available assistive technological tools in which I can offer to my students who struggle with reading disabilities. Although assistive reading technologies do present many prosperous learning and personal advantages for students, there are further questions that I believe are important to address and study. For instance, how would it be attainable and practical to train or provide access to teachers and educational aids about the available reading technologies? Lastly, how do facilitators incorporate balance for the use of assistive technology in order to prevent it from becoming a crutch for students? Ultimately, as assistive reading technologies become better understood by teachers and students it will translate into a greater awareness for the implications of reading technologies in

elementary classrooms.

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