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**Technology and disabilities: Why it can help and hinder learning**

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**Abstract**

Technology is a common occurrence in almost every elementary classroom today. In this research study, I am going to be discussing how technology can have both a positive and negative effect on students who have disabilities. My research methods included conducting an online survey and two interviews with parents and teachers. Through my research, I found that there are many concerns with how technology is used in the classroom, but for the most part it ends in a positive outcome for the students. However, there is always room for improvement when using digital technologies, and my research demonstrates that it takes cooperation between the parents and the teachers for technology to truly be successful for an elementary student. As a teacher candidate, my findings have shown how important technology is to elementary students, and how, when used in an appropriate manner, technology can be an incredible tool for students with disabilities to use.

## **Introduction**

When I was in school, the most technology that we ever had in my elementary classroom was a VCR player and a *Bill Nye the Science Guy* movie. Nowadays, technology is advancing at such a great rate that it can be hard for teachers to keep up. However, this advancing technology is not always a bad thing. For students with disabilities, it can be a great learning tool. In my own personal experience, technology has been a great benefit in my work with a boy who has Down syndrome. However, I worry that as he gets older, technology is not going to be an asset to his learning, but rather is going to take away from it.

Cyber bullying is becoming a big issue in classrooms today, and students with disabilities are often a target. Therefore, the purpose behind my study was to discover how technology can be both helpful and harmful to students with disabilities. As a future teacher it is important to me, because more often than not, there will be a student in my class with a disability, and I want to be able to help them with all aspects of their learning, whether it includes technology or not.

## **Background**

Prior to this research paper, I conducted a case study on a boy with Down syndrome that I work with on how his life differs at home and at school. This helped me get an idea of how his disability functions, and how certain disabilities change depending on the environment. With that said, to fully understand how technology can assist or take away from the learning of a student who has disabilities, it is important to understand that learning disabilities are quite diverse, and that technology may not help with all types of disabilities. In my personal experience, I have seen a range of learning disabilities that include dyslexia, behavioural codes, autism, and Down syndrome. The research that has been done regarding this topic has mainly been in regards to assistive technology.

In Forgrave's (2002) article about how assistive technology can be used to empower students with learning disabilities she discusses the benefits of technology with students in junior high and high school who have reading and writing disabilities. She claims that many "teachers, special educators, and administrators do not realize how technology can benefit their students" (Forgrave, 2002, p. 122). Forgrave focuses on three areas that use technology to benefit students: speech synthesis programs, organizational software, and voice recognition software. Speech synthesis programs focus on students who have comprehension problems. These programs work by "translating text that appears on the computer screen into computerized speech" (Forgrave, 2002, p. 123). This way, students are able to focus on the mistakes they made while reading and correcting them. Organizational software helps those students who have troubles writing. Organizational software helps students organize information into "maps" or "webs" that make it easier for them to process. Finally, voice recognition software also helps students who have troubles writing. Forgrave (2002) claims that "when students realize that voice recognition software allows them to produce neat work . . . their motivation will increase" (p. 125). Throughout the article, Forgrave also emphasizes the importance of educators being informed and educated in using assistive technology.

In another article by King-Sears, Swanson, and Mainzer (2011) about technology and literacy for adolescents with disabilities the authors also describe how assistive technology can benefit students with disabilities. They coin the term TECH, which provides steps for educators to help target those students who need assistive technology the most, and how to integrate it into their classroom activities. The TECH program stands for targeting the students' needs, examining the choices, creating opportunities, and handling the implementation (King-Sears, Swanson & Mainzer, 2011, p. 570). TECH is used for "choosing and using technology . . . [and]

targeting what students' literacy needs are related to the learning outcome" (King-Sears, Swanson & Mainzer, 2011, p. 570). The authors also provide scenarios that help demonstrate to educators this 4-step process. They conclude by describing how technology creates universal learning.

An article by Edyburn (2000) on the use of assistive technologies with students with mild disabilities expresses how little information there is on assistive technology. The authors starts by giving an overview of the characteristics of people who have disabilities, and describes how technology can benefit them. He claims that "the potential of technology for students with disabilities has consistently advanced" (Edyburn, 2000, p. 3). Similar to the previous articles, Edyburn describes the requirements for assistive technology for students with disabilities, and how when technology is used with these students properly, they can benefit exponentially. Furthermore, he describes four ways that showcase the potential for assistive technology, and explores the positive and negative sides of it. The author concludes by enforcing the fact that research is critical to the success of assistive technology.

Now that we have explored articles that focus on the positives of technology, we must also focus on the negative aspects that technology can have on students with disabilities.

The book *Disability and New Media* (Ellis & Kent, 2011) discusses the negative aspects of technology in relationship to disabilities, especially in the form of media. They particularly discuss how media is starting to exclude people with disabilities, as it is becoming less user friendly for those people who have disabilities to use. The book focuses mainly on the new branches of media, like *Facebook* and *YouTube*, and explains how people with disabilities are being embraced and excluded with this technology.

An e-book by Bouck (2010) has a chapter that investigates whether technology really solves all the problems of students with disabilities and documents some of the challenges. The author claims that technology “has great potential, but the expectations of technology far-succeed what it is capable of doing and hence leave feelings of frustration and dissatisfaction” (Bouck, 2010, p. 92). Essentially, technology can often become too complicated for a student to use, and as a result hinders learning instead of aiding it. The term “assistive technology” is also open to interpretation, as it means different things to different teachers. In essence, anything can be assistive technology, if used in the proper way. Therefore, how do we define exactly what should be used and what should not be used? The lines are blurred, and as a result teachers often end up confused about what types of technology they should be using with their students. The last issue with technology is that it is not available to all students. Bouck (2010) argues that “technology is not equivocal across contextual factors for students with disabilities; issues such as socioeconomic status and culture interact with access to technology” (p. 96). For example, technology might be more available in a private school, where they receive private funding and tend to have smaller teacher-student ratios, compared to a publicly funded school in a poor neighborhood where technology is not readily available to them.

From my review of the literature it is apparent that there are some contrasting arguments on this issue, and there are just as many negative aspects to assistive technology as there are positive aspects. In this study, I explored the ways that assistive technology can be used more efficiently in a classroom, and I sought public perspectives on how technology can be beneficial for students with disabilities.

## **Research Context**

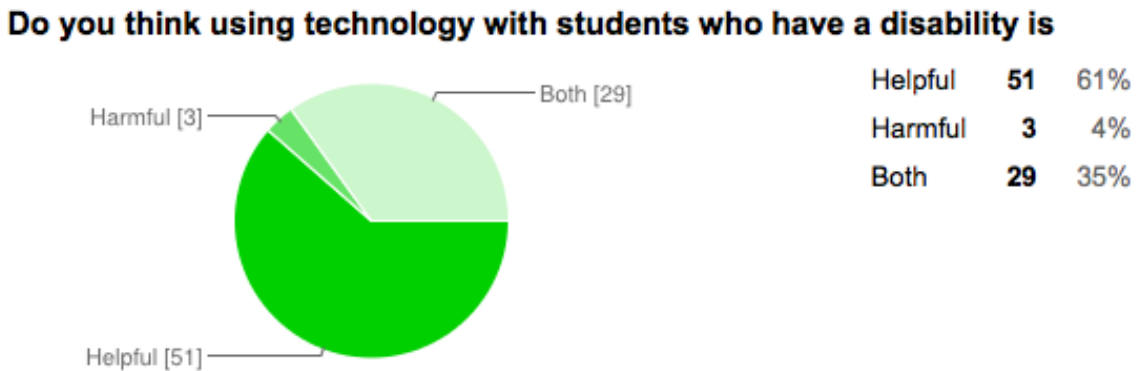
The research articles that I reviewed in the previous section were obtained from the Mount Royal University Library database. I also did a survey using *Google Forms* that allowed me to gather opinions from my fellow peers and the general public. I posted my survey on *Facebook* and *Twitter* in hopes of reaching as many people as I could about my topic and 83 people completed the survey. As a result of my survey answers, I also conducted two interviews to create a deeper understanding of the themes that arose. My first interview was with a parent who has two children with disabilities (one mild, and one severe). From there, I was put in touch with an educator, specifically a school technology specialist, and was able to gain insight from a person who does this for a living. In order to do this research, I completed an online training module on human ethics research provided by the Government of Canada and obtained a certificate stating that I completed the course and was able to conduct research involving people.

## **Methods of Investigation**

My general approach to my research was both quantitative and qualitative. I used a quantitative approach because I wanted to gain some statistics on how beneficial people thought technology is in the classroom. I also used a qualitative approach because I wanted to gain as much insight and as many opinions as possible so that I could determine how serious this issue is, and what steps could be taken to improve this issue. As I mentioned before, I used *Google Forms* to conduct research from a broad range of people. I then conducted two interviews to get specific opinions on my topic. I organized my data into different themes depending on how people answered the questions, and I separated the bigger themes to discuss in my interviews.

## Findings

I had many key findings in my data, and I divided them into four different categories: those who found technology helpful, those who found technology harmful, those who found technology to be neutral, and one thing people could change about technology. Figure 1 illustrates the range of perspectives from the participants regarding the relationship of digital technologies with students who have a disability.



*Figure 1.* Percentage of participants who found technology to be helpful, harmful, and neutral

### Helpful

In my survey, 61% of participants claimed that technology is helpful when used with students who have disabilities. My interview with a school technology specialist, who would like to remain anonymous, also resulted in mainly positive answers. She says that “technology is a tool to control [student’s] environment, communication, and to help develop cognitive and life skills” (Technology Specialist, Personal Communication, March 7, 2014). She provides assistance to all the teachers in her classrooms, as well as providing resources for the teacher when she is not there. She says that “technology provides different supports depending on the needs of that individual student. It benefits all demographics but in different ways” (Technology

Specialist, Personal Communication, March 7, 2014). I found similar answers in my survey, and divided them into four subcategories.

1. Different methods of learning: People felt that technology helped give children ways of learning that could be beneficial for the specific child, and that technology could be used to enhance learning.
2. Communication: For students who have severe disabilities and are non-verbal, technology can help them communicate to their teacher and their peers. It also can help students write notes if they have trouble with fine motor skills.
3. Award: Technology can be beneficial when being used as an award or as a break. It motivated the student to get their work done and helps them “unplug” if they are getting too overwhelmed.
4. Work with peers: Technology can help students fit in with their peers. Technology can help students express themselves, and it gives them the opportunity to bond with other students. As one person in my survey said, “it takes away the visual difference to other students because the child with the disability appears to be doing the same things they are”



*Figure 2.* Common themes for the helpful nature of assistive technologies



## **Harmful**

There were only a few respondents (4%) who thought that technology is harmful to students with disabilities. I separated their answers into three subcategories.

1. Distracting: Technology can sometimes make information hard to follow, especially with a student who becomes distracted easily.
2. Takes away from essential skills: Students still need to be able to learn essential motor skills. Fine motor skills need to develop, and sometimes they don't fully develop with too much technology present.
3. Prevents communication with others: Technology can discourage public communication and bonding with other students. By communicating with peers, we can create "normalcy" in social situations.

## **Neutral**

There were 35% of the survey participants who stated that technology could be both helpful and harmful. In my interview with a parent who has two children with disabilities, who preferred to remain anonymous, she found that technology was more beneficial with her son who has a mild disability (dyslexia). The technology that her son is allowed in class, his laptop and writing and reading programs, has assisted him greatly, and that "he would most likely not be looking at going to university if he didn't have technology available to him" (Parent, Personal Communication, March 3, 2014). However, she says that the biggest problem is that the students have trouble "unplugging" from their devices. These issues came up with my survey participants as well, and I have divided them into four subcategories.

1. Depends on the technology/disability: Technology has to be used correctly in order for it to be beneficial. It also depends on the disability. As teachers, we need to focus on individual differences in the classroom.
2. Should only be used as an aid: Children can become too reliant on technology, so it should only be used to help build opportunities, and not take away from the learning.
3. Communication/Socialization: Technology can help build communication skills, but can also take away from socialization. There needs to be a balance between the two.
4. Staying on track: Technology can be used to help classroom environment. It can help children feel like they are part of the class and can help them keep up with what other students are doing. However, it shouldn't be used too excessively. The teacher should only use it to help aid growth.

### **One thing you could change**

I asked both my survey participants and my interviewees the question “If there was one thing you could change about technology, what would it be?” In my interview with the parent, she said that she would like an “off switch” in regards to technology. She would like schools to take the time to get kids to unplug from their devices and do something physical (like take a walk) or something relaxing (like yoga or meditation). With the school technology specialist, she felt that technology is too expensive, and that it is too good of a tool for teachers for it to be unattainable because of cost. In my survey, I found similar results and divided them into six subcategories.

1. General changes: Essentially, keeping technology fun and simple for students to use. It should be available to everyone no matter what school district or financial situation.

2. Balance: There needs to be a balance between traditional and 21st century skills. Students should still need to learn how to print using pencil and paper as well as developing technology skills.
3. Providing more guidance and less distraction: Teachers need to effectively guide their students with the technology that is provided. Programs need to be steered towards being inclusive.
4. Those who were unsure: It was quite alarming to see how many people answered that they weren't sure what they would change in regards to this situation. This shows how little we, the public, know about this topic. I think it also shows how uneducated we are on inclusive education, and how we need to pay more attention to that aspect of school.
5. Only for educational purposes: Discussion needs to be had with students about appropriate and inappropriate uses of technology at school. Only school approved internet sites and games should be used in the classroom.
6. Accessibility: Technology needs to become equal for everyone, which means lowering the cost and providing proper training to all teachers.

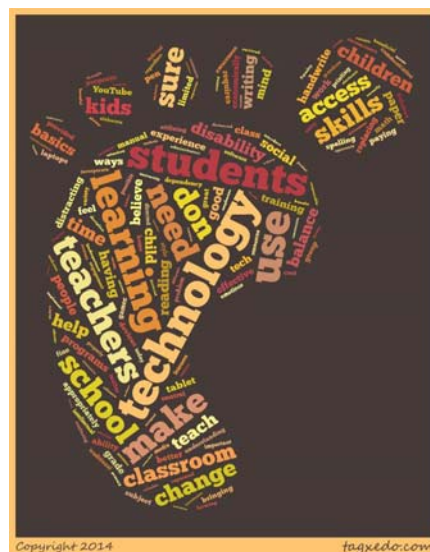


Figure 3. Common themes from the survey question about one thing you would change

## **Conclusions and Recommendations**

This research study has demonstrated to me just how complicated this issue is, and how there are many different ways that technology can be handled in a classroom. Overall, the general consensus of my research was that technology is mainly beneficial when used in an appropriate manner. This study has shown me many perspectives on how technology should be dealt with in a classroom, and that it will be up to me as the teacher to deal with the technology in a way that I find to be most beneficial. This study has also shown me how important parent perspectives are in the classroom. Parents can often offer teachers key insights into their students, especially those with a learning disability, and what works and does not work for them, and their voices should not be quieted. Some future research questions that this study has identified for me are what is the most beneficial type of technology that is available in the classroom? Also, in what ways are the students with disabilities benefiting from technology, and how can we make that universal?

Through my research, it is obvious to see that there are many different solutions and opportunities for change in regards to technology. Nothing in this world is perfect, and it will take co-operation between teacher, parents, and students to ensure the success of all students, especially those with disabilities. Technology can be a huge factor in that success, and should be provided as an opportunity to every student that needs it.

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