

**Mount Royal Undergraduate Education Review**

---

Volume 1(2)

Fall 2014

---

**The use of technology in the classroom to assist students with learning disabilities**

Erin Krysko, *Mount Royal University*

[Link to Digital Story](#)

**Abstract**

The purpose of my investigation was to look into the ways digital technologies can be used in the classroom. My study was focused on the question “how can assistive technology be used in the elementary school classroom to foster inclusive education?”. The research was conducted through the use of personal interviews, surveys, and statistical data. Results were organized using word clouds, participant quotes and graphs. My research concluded that there are many types of assistive technology that are being used in the classroom. While teachers are not always using this technology consistently, the overall perceptions of my participants were that the advantages outweigh the disadvantages. These results show how essential assistive technology is for not only individual students, but a boost the morale of the entire classroom community.

## **Introduction**

The question I really wanted to answer about the use of digital technologies in k-6 education during the fall 2014 semester was: “How can assistive technology be used in the elementary school classroom to foster inclusive education?” This is really important to me because I spent the past summer working with children with learning disabilities. Many of these children had issues at school. Their academic struggles impacted their self-esteem and many had difficulties fitting in. School should be a great experience for children, where they feel welcome to grow and develop. It was discouraging for me to hear the difficulties that many of these students were having.

In addition to my experiences this past summer, I myself have a learning disability and AD/HD. This research project is extremely personal for me. I am really hoping that by learning more about the assistive technologies available for students it will help me in my teaching career to be a facilitator of positive learning experiences for all students in my classroom, regardless of diagnosis or abilities.

## **Background**

According to the Learning Disabilities Association of Canada, (n.d.) one in every ten Canadians has a learning disability (para 1-3). Teachers need to do what they can to ensure the academic success of all of their students. Assistive Technology is a great way for teachers to support the students in their class with exceptional learning needs.

Raskind and Stanberry (n.d.) define assistive technology (AT). They state that “AT for kids with LD is defined as any device, piece of equipment or system that helps bypass, work around or compensate for an individual's specific learning deficits” (Raskind & Stanberry. n.d. para 4). Assistive technology allows students with disabilities to use their strengths to address

their challenges (Raskind and Stanberry, n.d. para 3). Contrary to popular belief, individuals with learning disabilities actually have average to above average intelligence. These children tend to have one area where they really struggle, while performing on par with their peers in others. Assistive technology helps these students by giving them the strategies that they need to meet their full academic potential.

Bowser and Reed (2010) explains that there are six categories in which assistive technology can help students (para 7). These categories are: writing, reading, math, studying/organization, listening/note taking, and access to curriculum resources (Bowser and Reed, 2010, para 8-12). The Learning Disabilities Association of Canada (n.d.) also includes speech in their list of areas in which assistive technology would help a student (para 1).

Raskind and Stanberry (n.d.) point out that while students may become overly dependent on assistive technology, they otherwise need to rely too heavily on teachers or parents for help (para 6). Even for students who depend heavily on assistive technology, Raskind and Stanberry (n.d.) argue that the added benefit of independence outweighs the drawbacks of this technology (para 6). This stance is echoed by Bowser and Reed (2010), who tell parents, “even when you decide to use assistive technology, it is important to make sure that the focus doesn’t get pulled totally away from skill development. In other words, don’t stop teaching and holding the child accountable to learn new skills” (Bowser and Reed, 2010, para 29).

The National Centre for Learning Disabilities (2014) reminds parents and teachers that “there is no one-size-fits-all assistive technology, so be prepared to spend some time finding the right matches for your child’s particular needs” (para 11).

This background information really provided me the foundation I needed to conduct further research in regards to my topic. I was very excited to explore this topic by conducting my own research study.

### **Research Context**

I conducted the majority of my research through online surveys using the *Google Forms* application. The participants in my research were 15 teacher candidates in the Bachelor of Education program at Mount Royal University as well as a friend of mine attending the University of Victoria. I reached out to potential participants through social media (*Twitter* and *Facebook*) and email contacts. Before completing my study, I completed the Government of Canada' Ethical Conduct for Research Involving Humans Course on Research Ethics (Figure 1). This online tutorial informed me about the many ethical considerations I needed to make before conducting my study. To ensure that I was following correct ethical standards, I included a disclaimer in my survey description informing participants that there would be no risk in their participation in my research. Additionally, none of the participants in my research were under 18 years old. Research participants were asked to talk about their experiences in the classroom, but no individual child or children were talked about. Participants only provided their general ideas and observations. In my *Google Form* survey, I collected no names in my data collection. I did ask some demographic information in my study to see if there were any difference in responses from individuals of different ages and genders. I did not collect enough responses though to include this in my research. Another demographic I looked at is which school district my participants were most familiar with. I wanted to see if there were any differences between different school districts.



Figure 1. Certificate of completing the online research ethics tutorial

In order to see individual responses, I used the *Google Form* application to create a spreadsheet of responses. To ensure anonymity, all participant responses were referred to in this report by a number, which had been determined based on the order responses have been received

### **Methods of Investigation**

I collected the information for my investigation in three ways. My primary source of data collection was through a survey that was sent out to my peers via mass email, personal email, *Twitter*, and *Facebook*. I asked eleven questions in my survey. The eleven questions I asked my participants ranged from demographics, the observation of technology use in the classroom, and their own personal perceptions about technology integration. I also gathered information for my investigation through personal interviews. Additionally, I looked at statistical information. To gain a better contextual understanding, I also thought about my own observations working at a summer camp and teaching a Saturday social skills class for students with Learning Disabilities

or AD/HD.

For my multiple choice survey responses, I was able to create graphs using the *Google Spreadsheet* application. This gave me quantitative data about the use of assistive technologies in the classroom. For short answer survey questions, I converted the responses into a word cloud to highlight response frequency. In order to get accurate results, I removed words like ‘students,’ ‘learning,’ and ‘technology’ from these lists because those words were showing up in disproportionately high frequency. To allow me to put the key ideas and themes into context, I also looked at individual quotes taken directly from the results to complement my word clouds.

I analyzed the collective responses from all respondents individually for each question, and then used that data to make broader conclusions from my research to help me in my future practice.

After analyzing my data for the survey responses, I opted for a personal interview with my academic strategist, Gina Martino, to help get additional insights and information. Gina has experience in the use of assistive technology through her position as an academic strategist at Mount Royal University and her career as a classroom teacher for the Calgary Board of Education.

### **Findings**

For the survey portion of my research, I asked participants 11 questions about their experiences using assistive technology in the classroom. I started with a few demographics questions to get a better understanding of my participants.

### How old are you?

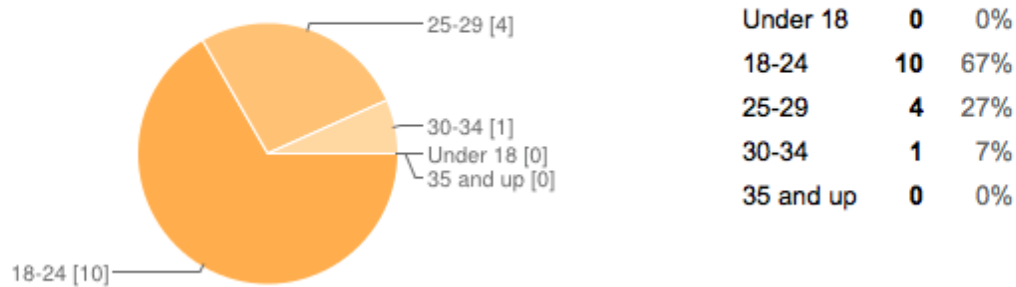
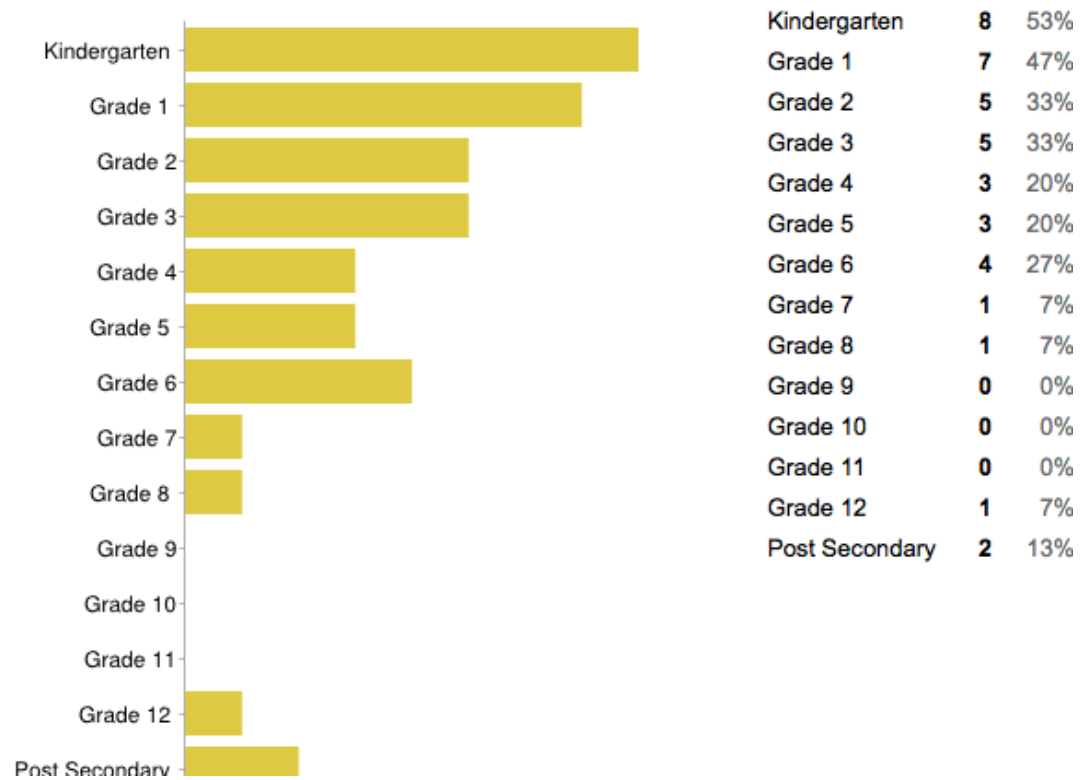


Figure 2. Graph on participant age

The Bachelor of Education program at Mount Royal University has a wide variety of students of all ages. While many of the participants in the 18-24 category may remember assistive technology being used in their school experience (whether personally or by a classmate) 33% of those surveyed have been out of high school for 7 years or more. This means that I need to consider in my results that many of my participants will be basing their responses from only being in the classroom part time. Even though a few hours a week gives a snapshot into the elementary classroom, it is difficult to get a complete understanding of what goes on day-to-day.

I next wanted to get an understanding of the grade level that my participants have worked most closely with. A graphic representation of the response is below.

**What grade level(s) have you worked most closely with?**



*Figure 3.* Participant experiences working with children

For this question, I really wanted to get some background from my participants to tell me what types of experiences that my participants have had in the classroom. This gave me lots of context for my information. In order to get the accurate responses to this question, I allowed participants to select more than one option. Interestingly, a majority of the participants in my study have worked with kindergarten aged students, almost half have worked in a Grade 1 classroom, and an additional third of participants have some experience in Grade 2 classrooms. Only two of my participants indicated that they had no experience in a Kindergarten or grade 1 class. This makes my results slightly skewed, as I lack a proportionate amount of responses from all the different grades. Even if I focus and narrow my research to elementary grades, division II is still underrepresented. This is important for me to know because most learning disabilities are



not diagnosed until later grades, as the symptoms are not usually noticeable until the child enters school, and the diagnosis process usually takes time.

Once I had an understanding of the types of experiences that my peers have had, I wanted to answer the question: “What types of assistive technology do you notice being used in the classroom to aide students with disabilities?” To analyze the responses, I used a word cloud.

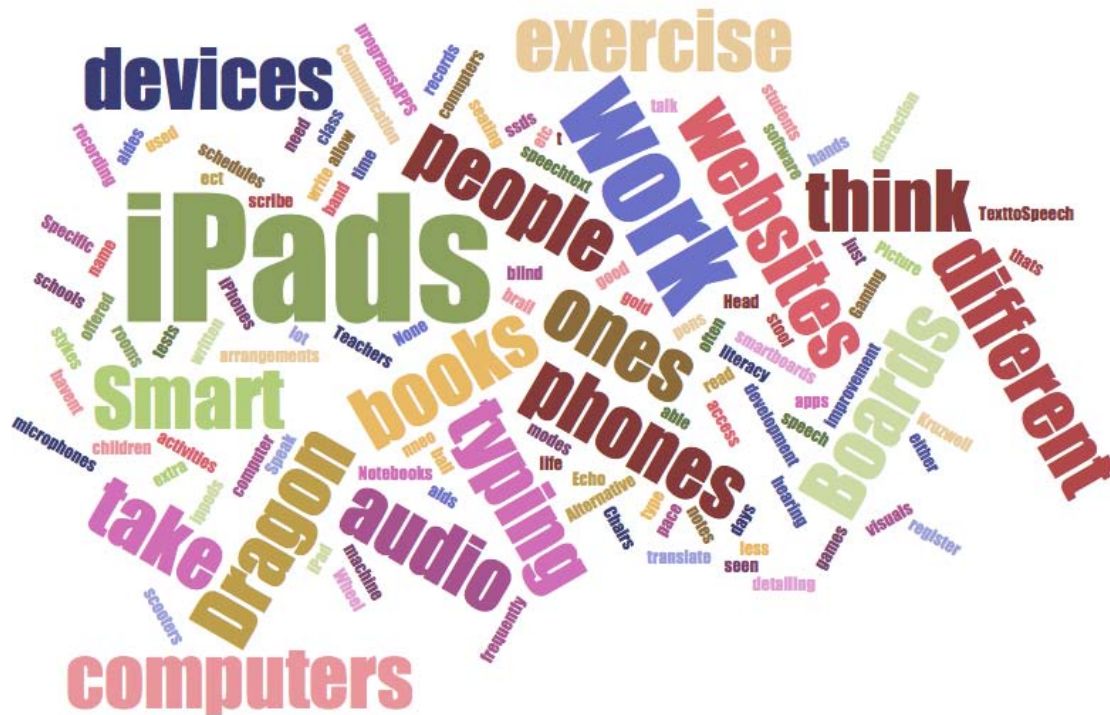


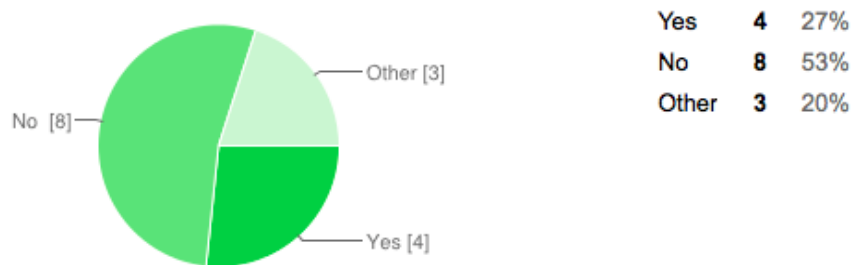
Figure 4. Word Cloud of responses to the question from my survey “What types of assistive technology do you notice being used in the classroom to aide students with disabilities?”

My peers mentioned many technologies used in the classroom including: ipads, smart boards (a brand name referring to interactive whiteboards), text-to-speech software (Dragon or Read and Write Gold), and phones. This reinforces the information from my background section that there are lots of options for students.

I question whether or not assistive technology is being used consistently in the classroom.

I asked my participants the question “Do you find that teachers use these assistive technologies consistently in the classroom?” I have organized the responses to this question in the graph below.

**Do you find that teachers use these assistive technologies consistently in the classroom?**



*Figure 5. Statistics from my google survey*

I was really surprised to find that a vast majority of participants responded ‘no’ to this question. At the same time reality may not be really represented in this graph because I forgot to include a box for elaboration on the ‘other’ option so my results are not as accurate as I would have liked. Even with that in mind, the fact that over half of the research participants did not see assistive technology being used consistently is really a cause for concern.

The next question asked in my survey was “What are the advantages that you see to using assistive technology in the classroom to help students with Learning Disabilities and/or AD/HD?” This helped me begin to see the ideas and opinions of my peers on the topic of my investigation. I converted the written responses into the word cloud below.



In addition to the key themes emerging in the word cloud, I also wanted to look at individual answers to give further context. Participant 13 gave a beautifully worded response to the question saying:

*Assistive technology gives students access to learning. Students with learning disabilities or ADHD have the tools they need to communicate their thoughts and learn, as well as develop their day-to-day routines and skills. In addition, students are able to gain a degree of independence and confidence they might not have otherwise developed. Overall, it is a very inclusive aspect of the classroom and creating a community.*

Similar ideas were also expressed by other responses. Participant 6 wrote that by “having [assistive] devices available for students will make the learning more enjoyable and easier.”

Participant 9 answered that “*students can learn at their pace. Confidence and self-esteem build. Self-efficacy is enhanced. Students will become more excited to learn.*”

These responses (both from the word cloud and short response) indicate to me that assistive technology has far more advantages than I had originally understood. Assistive technology gives a student the ability to perform at the same level of their peers and with that comes additional benefits of increased self-confidence, a higher level of student independence, and a more engaged learner in the classroom community.

To get a more well rounded understanding of the use of assistive technologies in the elementary school classroom, I asked the question “What are the disadvantages that you see to using assistive technology in the classroom to help students with Learning Disabilities and/or AD/HD?” The results are displayed in the word cloud below. It should be noted though that many of the disadvantages were qualified with words including ‘might,’ ‘may,’ and ‘maybe’ indicating that these are concerns that teachers have about potential situations and these

disadvantages may not be exhibited by all students using assistive technology.



Figure 7. Word Cloud created from the question “What are the disadvantages that you see to using assistive technology in the classroom to help students with Learning Disabilities and/or AD/HD?”

Many of my participants indicated that they have concerns about using assistive technology in the classroom. The concerns that assistive technology may be a distraction and that students may become dependent on this technology were made clear. The distraction of assistive technology is also a concern for me, as I personally have occasionally gotten distracted when using my computer at school.

Dependency was another issue that was raised by participants. Participant 4 indicated some worry about the dependence of students on technology, and the threat that may have on a child’s written language skills. She stated that “students rely on technologies too much... what about their handwriting?”

The short answer responses also indicated that teacher candidates have some concerns about the peer reaction towards students who are using technology in the classroom. Participant

10 worries that students “might be singled out by not learning traditional forms of learning in the classroom.” This was reiterated by Participant 6 who responded that other “students may be jealous that some kids get some devices that they may not have.” I will admit that I did experience this reaction from my peers when I was in elementary school. I was given access to a CD player during class and on the bus to help me focus. I did feel some resentment from other students who were unable to have the same accommodations. I believe though that because technology is becoming ever more prevalent in the classroom, that it will be rare to have a single student using a device.

After being shown the information from the study about the disadvantages my participants saw (distraction, dependency), I asked my interviewee, Gina, to comment on the reality of these situations happening in a classroom. Gina stated:

*For me the biggest... that comes up...Is the technology working? Does the facilitator or the teacher have the expertise to facilitate whatever it is that child needs to know while using the assistive technology? And is it becoming a bit of a crutch like a dependency? Is that the only way a student can learn? Is it enhancing their learning or is it detracting from their learning?... (Gina Martino. personal communication. November 12, 2014).*

Gina also commented on the possibility that assistive technology could be a distraction for students. She responded saying:

*Technology is so prevalent now in everybody's home, students are so used to it, they use it themselves there might be a bit of jealousy because those kids love technology and if they are sitting there and they have to write their notes for example or copy from the blackboard and then the other student might be able to just type their notes or*

*be given their notes or record their notes I think there might be a little distraction going on and then that might signal also that child out which is another thing that may be a disadvantage.* (Gina Martino. personal communication. November 12, 2014).

Two other disadvantage that were mentioned but did not show up in the word cloud results (due to a low frequency of use) were the issues of cost and integration. Participant 13 pointed out that “Assistive technology can be costly and difficult to access.” This could be a huge issue for families with limited financial means. Participant 13 also goes on to say that “it may take time to integrate and teach students how to use the technology.” This could also be extend to teachers who need to be able to personally operate the technology before using it with a student.

Gina also talked about the financial impact in the implementation of assistive technologies:

*I think the expense too was another [disadvantage]. How much technology is required for a specific classroom? is that part of the school budget? Is it part of the classroom budget? Is it mom or dad? Yeah, Where is it coming from? I think ultimately if it is the Calgary board of Education, it has to come from the school.* (Gina Martino. personal communication. November 12, 2014).

After evaluating all of the advantages and disadvantages of using assistive technology in the elementary school classroom, I felt it important to inquire with my peer respondents “Does this technology improve student performance? Why? Why not?”



Figure 8. Word Cloud created from the question “Does this technology improve student performance? Why? Why not?”

The responses for this question were predominantly ‘yes,’ but many participants had conditions or apprehensions. Participant 9 weighed the pros and cons saying:

*I think that it can go both ways. I think that it can improve a students performance because they will gain confidence while using technology. The hope is for students to not depend of the technology and eventually become independent learners.*

Participant 5 explained that assistive technology improves student performance “if the program is a well-developed program... The students are more engaged and comfortable learning in their environment if they have the tools that they need in order to succeed.” Participant 1 answered that assistive technology “may be used as a tool to help support student performance but should



not be relied upon as a substitute for other learning activities.” Participant 13 has a more positive outlook, responding:

*Assistive technology improves student performance in many ways academically as well as socially and emotionally. Many students find that they can now complete the same tasks as their classmates and are included in the classroom community. This boosts self-esteem and confidence. Assistive technology can also allow students to work at their own pace and gain independence in academics and daily activities.*

The variety of responses I received were extremely surprising. I went in to this investigation with the assumption that my respondents would view assistive technology positively. The variety of results really shows that assistive technology isn't as widely understood as I had assumed. Teacher candidates have many reservations about using assistive technology in the classroom.

### **Conclusions and Recommendations**

This inquiry project has taught me so much about assistive technology in the classroom. Firstly, I have learned about the variety of technology available for students to access. The implication for teachers in the variety of resources is that they have to be very knowledgeable about not only how to use each resource, but also in how to select an appropriate tool to meet the needs of each student.

I have also realized the lack of experience my peers have had with digital assistive technologies. Many of my peers indicated in the survey that they simply had little to no experience with assistive tools. I think that many concerns my peers have listed would be eased if they better understood the technologies available.

This study has identified many further questions for future research. One of the things

that my study did not include was the opinions, understandings, and assumptions my peers have about learning disabilities. Another question for future research is ‘How can pre-service teachers learn about the implementation of assistive technology in their future practice?’

Finally, I have learned that implementing assistive technology takes a lot of time and commitment. While I am in school and once I graduate, it will be important for me to look into professional development opportunities that assist teachers in using assistive technology as it changes.

I have also learned that assistive technology can be the resource that a struggling student needs to become successful. When it comes to helping students, there is never a one-size-fits-all strategy. Teachers need to figure out what works for each student to meet their individual needs. All things considered, assistive technology does empower students and allows them to demonstrate their skills, knowledge, understanding, and abilities at the same level of their peers. When the esteem of one child is boosted, the entire classroom community reaps the rewards.

### **References**

Bowser, G. and Reed, P. (2010). *Considering your child’s need for assistive technology*. LD

Online. Retrieved on September 22, 2014 from <http://www.ldonline.org/article/6246/>

Creno, C. (2013). *Assistive technology aids special education*. Azcentral. Retrieved on

September 18, 2014 from

<http://www.azcentral.com/news/arizona/articles/20131216assistive-technology-aids-special-education.html>

Learning Disabilities Association of Canada. (n.d.) Learn more. Retrieved on October 28, 2014

from <http://www.ldac-acta.ca/learn-more/ld-basics>

National Center for Learning Disabilities. (2014). *Assistive technology: 10 tips to help your child work around a learning disability*. Retrieved on September 22, 2014 from

<http://www.nclld.org/students-disabilities/assistive-technology-education/assistive-technology-ten-tips-help-your-child-ld>

National Center for Learning Disabilities. (2014). *Apps for students with LD: Organization and study*. Retrieved on September 18, 2014 from

<http://www.nclld.org/students-disabilities/assistive-technology-education/apps-students-ld-organization-study>

Raskind, R. and Stanberry, K. (n.d.). *Assistive technology for kids with LD: an overview*. Great Schools. Retrieved on September 18, 2014 from [http://www.greatschools.org/special-](http://www.greatschools.org/special-education/assistive-technology/702-assistive-technology-for-kids-with-learning-disabilities-an-overview.gs?page=all)

[education/assistive-technology/702-assistive-technology-for-kids-with-learning-disabilities-an-overview.gs?page=all](http://www.greatschools.org/special-education/assistive-technology/702-assistive-technology-for-kids-with-learning-disabilities-an-overview.gs?page=all)