

Defeating the digital divide

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Abstract

In my personal experience I witnessed a discrepancy between what was available to schools and students from high and low socioeconomic areas. This made me wonder about their access to digital technologies, specifically how the digital divide affects education and how I can help as an educator. Using information from background research, an anonymous survey completed by my peers and current teachers, and an interview with an expert, I was able to conclude that digital technologies are an effective educational tool used to enrich students' learning experiences. This can be achieved using a variety of different strategies and tools, including Smart technology, tablets, video blogs, and experiments. Educators should participate in professional development opportunities to help lessen the digital divide. This in-depth knowledge will give them the skills to effectively use digital technologies in their classrooms. Schools can also ensure students have access to technology to balance any lack of access at home.

Introduction

In my summer job, field experience, and school tours each student was different. Some of these differences included their temperament, learning style, or background. When I went to James Short Memorial School for a tour, I was extremely moved by the lengths the school went to support diverse students and their families from a higher needs area of Calgary. Transitioning from James Short Memorial School, where some students' families do not have enough money for a winter jacket, to Cranston School for my field experience, where there is little need or diversity, was hard to see.

Similarly, one assignment I had in my summer job was to process applications for our summer school program. The fee with for the summer course is \$50.00. For most families this was not an issue, however, every year I would get phone calls from families asking if they could make an exception because money was so tight at home. It was so sad to think that the difference between having or not having an extra \$50.00 would determine whether or not a student could take a course with us and consequently limit their education.

Socioeconomic differences between students are a very real concern in education. I believe teachers should work to even the playing field for these students. The inclusion of technology in education could pose a real concern for low socioeconomic families; students from high and low socioeconomic statuses are eager to learn, but this new technology is not practical for some households. If some cannot afford a \$50.00 school fee, how could they afford a \$1000.00 computer? I am interested to learn about any potential differences in the use of technology from schools in different socioeconomic areas and how this impacts student understanding. This helped to shape my research question, which focuses on identifying the digital divide's impact on education and how can educators work to lessen the gap.

I hoped the research into this question would help me better support my students from low socioeconomic backgrounds, and make me more mindful of the technical requirements of the structure of lessons and assignments, including the possible price tag that accompanies this for families.

Background

Traditionally the digital divide has been known as the difference in technological accessibility between students with high socioeconomic status and students with low socioeconomic status. Although this is still a concern in many areas of the world, in developed countries, such as Canada and the United States, most people have access to technology regardless of their socioeconomic status. Given the growing widespread access to technology, my background research indicated the transition beyond the Top-Level Digital divide to the Second-Level Digital Divide and suggestions to improve the digital divide that stressed the importance of professional development to use technology in meaningful ways to facilitate learning.

Recent research from Clarke and Zagarell (2012) raised concern about the lack of technological education and support for teachers that contributes to the technological divide in schools. It challenges the assumption that “digital natives” are great with technology and suggests that their knowledge surrounding technology is superficial (p. 137). Recommendations to help increase the productive use of technology in classrooms include: increased assistance and leadership from administration to follow through with the integration of new technologies, keeping up to date with new technology, and more professional development for administration and teachers so they can understand effective ways to incorporate it into curriculum and lessons.

Researchers Kalyanpur and Kirmani (2005) examined how the level of access to

technology varied between those affected by the digital divide, including low-income minority students, students from culturally diverse backgrounds, students with disabilities, and female students. To combat limited access to technology they suggest creating government policies to access current and useful technology within schools, widen the accessibility to computers in public areas, educate students to be “effective users of technology” (p. 15), train parents and school administrators, effectively integrate technology into lesson plans, give students with disabilities the appropriate assistive technologies, and create supportive learning environments for students and educators to learn about technology.

A recent study in China examined 658 students between the ages of 10-14 using a three-part questionnaire to explore the urban-rural digital divide. The questionnaires respectively focused on: socio-demographic data, available social support systems, and behaviour and academic performance, with a focus on the role of internet self-efficacy. The study recommends that students should have better access to technology in school to balance any lack of resources at home for lower socioeconomic students. Teachers should be trained in the uses of digital technologies to better support their students and enrich their practice (Li & Ranien, 2013).

One study focused on the Second-Level Digital Divide (SLDD) within K-12 which puts emphasis in how technology is being used in the classroom, as opposed to the Top-Level Digital Divide, which examines the differences between those who have access to technology and those who do not. To bridge the gap between students who are receiving technologically enriched education as a means to deepen their understanding and critical thinking skills, rather than to, “supplement instructional practices ...[with] limited use of available technologies and ... weak methods” (p. 191), appropriate professional development for teachers is recommended (Reinhart, Thomas, & Toriskie, 2011).

Using information from a qualitative survey, the technological inequalities in 64 Californian schools during a seven month period were examined, and it found that high socioeconomic and low socioeconomic schools had access to computers and internet. The inequalities existed in how these technologies were incorporated into the classroom, and the study found that technology was used in more meaningful and complex ways in higher socioeconomic schools, such as to create statistical analysis, whereas low socioeconomic schools typically used them to create PowerPoints or write papers. Suggestions to improve inequalities include training teachers and administration, giving extra funding to support English Language Learners, use technology for scholarship and inquiry rather than mastery, and create a better approach for students without home computers (Warschauer, Knobel, & Stone, 2004).

The research suggests that the current issue surrounding the digital divide is less that students from low socioeconomic status do not have access to digital technologies, but rather teachers, administration and parents lack the knowledge to effectively integrate technology into education; this is called the Second-Level Digital Divide. Schools need to focus on creating effective methods to incorporate digital technologies into lesson plans that will help deepen student understanding of the topic and the technology itself. To help aid this transition administrators should work with their teachers to provide opportunities for professional development that will keep them up to date with new technology and inform teachers of innovative ways to include them in their classroom.

Research Context

Using Google Forms I created an online survey, which was completed by eleven anonymous fellow teacher candidates at Mount Royal University and current practicing teachers. To ensure my participants would be protected from harm, I completed the Government of

Canada Ethics tutorial to receive my certificate in ethical research. Before my participants answered my questions I outlined my research proposal and ensured they knew their participation was voluntary, confidential, and only people over 18 years old were able to participate.

I interviewed Trudi Rowlands via email who is a vice-principal at The Centre for Learning@HOME, which is an Alberta wide online school with over 3000 students. She directly oversees the professional development of teachers in blended and traditional programs. She holds a Doctorate Degree for her research in assistive technologies in education, and is one of my supervisors in my position as an administrative assistant in my summer profession.

Methods of Investigation

I used Google Forms to create my survey to distribute online to my peers at Mount Royal University and current professionals in the education field. The survey consisted of a combination of six multiple choice questions and four paragraph form questions. I analysed my data from my survey by organizing it into visual representations, specifically a graph and Wordle that identified commonly used words from paragraph form survey responses. To analyze paragraph form responses I used Google Spreadsheet.

To conduct my interview I emailed specific questions to an expert that gave me insight into her experience with the topic, as well as her suggestions to overcome any difficulties. Her responses offered additional information that I organized into written responses. I related it to the background information research from my articles from the Mount Royal database, as well as the paragraph form survey answers to determine if there are any similarities, differences, or patterns.

Findings

In this part of my research study I have organized my data from my survey, interview,

and background research into various forms including graphs, Wordles, and direct quotes that will help to identify the digital divide's impact on education, and how educators can help overcome its impacts.

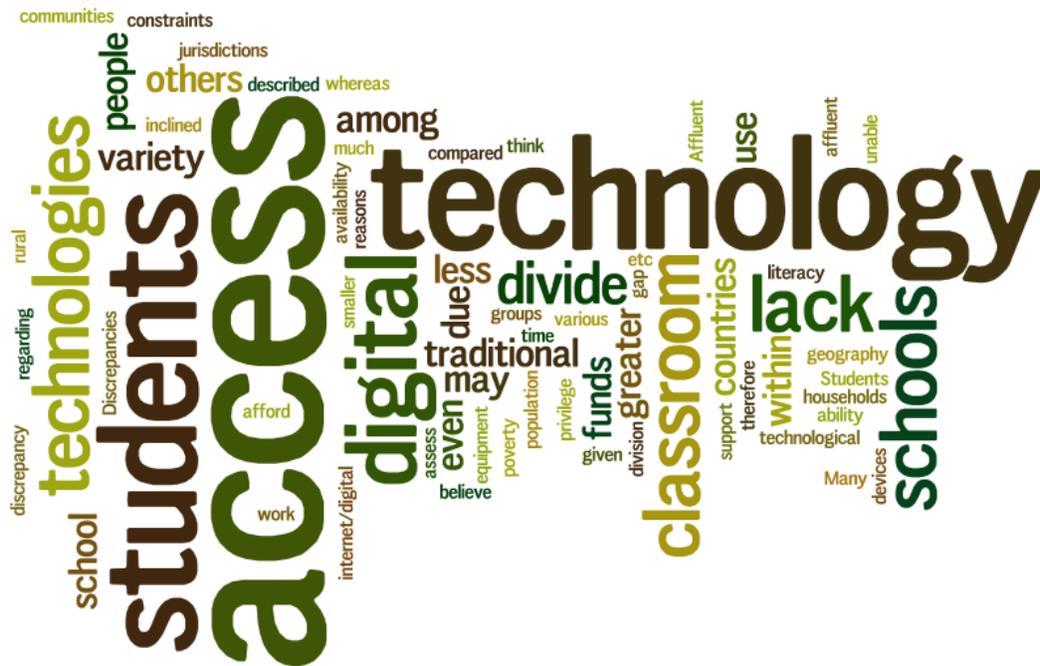


Figure 1. What is your definition of the digital divide?

The majority of my survey responses indicated the digital divide was the inequality in access to digital technology when comparing students with higher socioeconomic status and lower socioeconomic status, using keywords such as access, schools, funds, and constraints. While most participants described the Top-Level Digital Divide, none of them described the Second-Level Digital Divide (SLDD) (Reinhart, Thomas, & Toriskie, 2011). In my interview with Trudi Rowlands I asked what she thought of using digital technology in education. Giving recognition to the SLDD she said, “when digital technology was first used, it was a tool for teachers to simply PRESENT information and to communicate with students and parents. NOW we are moving towards classrooms in which students, themselves, are using technology to support their learning and eliminate the barriers they may experience to learning through the use

of appropriate technology selection. ... You need teachers and staff to be well trained in how to use the technology - if they can't use it, then when a child needs help they can't offer that support effectively" (personal communication, November 9, 2015). There has been a shift in the way we use technology in education to activate learning, and the lack of shift creates the SLDD.

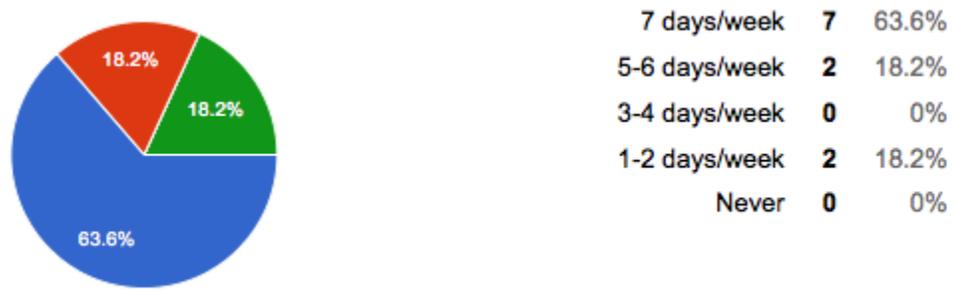
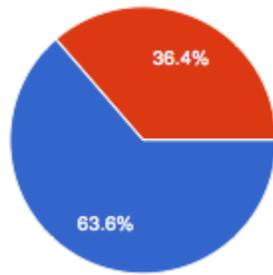


Figure 2. How often do you use digital technology outside of the classroom?

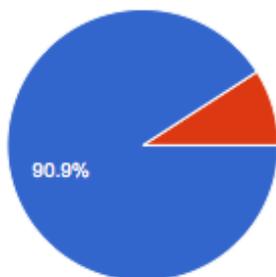
9 out of 11 participants use technology outside of the classroom more than 5 days each week. Of those 9 participants who identified themselves as using technology more than 5 days each week, 100% of them thought a student's socioeconomic status should not impact their quality of education. Of these 9 participants, 8 of them believed their learning would be negatively impacted if they did not have access to technologies such as a laptop, tablet or smartphone. If a student's socioeconomic status prevented them from having adequate access to these technologies at home this would negatively affect their learning. Strategies offered by participants to overcome the lack of technological resources included providing lots of class time to work on assignments that require digital technologies, having digital literacy training in school, hosting school fundraisers, even distribution of school funding, schools and local libraries renting out digital technologies, and providing family funding.



Very	7	63.6%
Somewhat	4	36.4%
Not very	0	0%
Not at all	0	0%

Figure 4. How competent would you describe yourself with regards to digital technology?

As educators it is beneficial to familiarize ourselves with current and new technologies. This knowledge can help improve our self-efficacy when working with digital technologies and result in more frequent and enriching learning experiences using them (Li & Ranien, 2013). Rowlands, an administration member at an online school, keeps up to date with digital technologies by reading reputable journals (not just magazine articles), engaging in professional research such as continuing education, sharing her findings with staff, postgraduate work, and choosing reputable and credible sources so that she does not become misinformed or pass on inaccurate or misleading information which could actually damage her learning and that of her staff (personal communication, November 9, 2015).



Yes	10	90.9%
No	1	9.1%
Maybe	0	0%

Figure 5. As an educator would you consider participating in professional development to develop your knowledge of digital technologies?

All five of my articles for background knowledge noted professional development of

teachers as being a key factor to overcome the harmful effects of the digital divide. Professional development opportunities are a key component of improving teaching practices and student learning; Rowlands arranges Professional Learning Communities (PLCs) for her teachers every Friday for 1:30 hours; they can, “involve arranging mentorship with staff regarding a specific issue or whole staff development via a workshop style learning opportunity” (personal communication, November 9, 2015).

Background sources stress that leadership from administration to teach and follow up with their staff about new technologies is a major contributing factor to lessening the effects of the digital divide. At The Centre for Learning@HOME, teachers complete exit slips at all training days. Additionally, “surveys are completed to highlight areas of success and challenges, so that future planning can include staff feedback and thus increase the efficacy of the future training and staff development selected and provided ... [Administration] encourage staff to explore new technologies and establish what best works in [their] environment in support of [their] students” (Rowlands, personal communication, November 9, 2015). As a result of this professional development teachers at The Centre for Learning@HOME, “are VERY comfortable using technology to deliver distance, online learning opportunities. They comfortably use all platforms provided to enhance the learning experience of students and are also comfortable recommending various digital technologies to support their students who may require accommodations to enhance their learning experience” (Rowlands, personal communication, November 9, 2015).

Figure 6. Consequently, I do not believe that removing digital technologies from education is a productive way to lessen the digital divide.

Conclusions and Recommendations

This study has helped develop my understanding of what the digital divide is, how it is affecting education in our society, and what I can do as an educator to offset its effects. Being able to identify its adverse effects, I can help develop my practice to defeat the digital divide's impacts on students. A key component to overcome the digital divide is to engage in professional development opportunities to expand my knowledge of the uses of new and current digital technologies. There are so many resources available to me and other teachers, some free of cost, to help grow my knowledge of incorporating digital technologies such as websites, scholarly journals, postgraduate work, and sharing my findings with fellow teachers. Identified in my background research, survey results, and interview, there are a copious amount of ways to incorporate digital technologies into the classroom including webinars, discussion forums, SMART technology, and tablets.

I would be interested to compare the success of students in schools in low and high socioeconomic areas. I would also like to see if there is a correspondence between student success rate and the effective use of digital technologies in education.

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