Peel District Elementary Teachers using “Bring Your Own Device” to Enhance Digital Literacy and Student-Centered Learning.

By

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ABSTRACT

The use of technology in education is not recent and has been implemented in classrooms to support student learning over time. Furthermore, its value has been well documented in the literature. With the power to revolutionize technology as new advancements are made, recent trends in educational technology such as Bring Your Own Device are made possible. Bring Your Own Device allows students to bring in personally owned devices into the classroom to support learning objectives. The purpose of this qualitative research study is to describe Peel District elementary teachers’ perceptions on whether or how, consistent use of the BYOD program in teaching digital literacy creates meaningful learning experiences for students. A comprehensive literature review on the topic of technological integration was completed followed by three semi-structured interviews with experienced educators employing the program. Data analysis yielded common themes among the participants which include the importance of students being digitally literate, the learning environment conducive to BYOD, student interest as a guide for instruction, and the supports and challenges associated with implementing the program. These themes and the implications of the study will be discussed in greater detail.

Keywords: Bring Your Own Device, Digital Literacy, Student-Centered Learning, Elementary Teachers, Peel District School Board, Technological Integration, Student Interest, Collaboration, Inquiry, Differentiation, Problem Solving, and Access.
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Chapter 1: Introduction

Introduction to the Research Study

In 2012, the Peel District School Board of Ontario implemented their Bring Your Own Device (BYOD) Program as part of their Vision for 21st Century Teaching and Learning (Peel District School Board, 2013). The program arose from consultation with staff, parents and the community in the form of a survey regarding the future of technological instruction (Peel District School Board, 2013). It authorizes students to use personally owned devices in the classroom for educational purposes and also allows the opportunity for learning to happen anywhere and anytime, supporting innovation, and promoting extended access to students (Peel District School Board, 2013). Moreover, the program permits students to demonstrate learning through a media of their choosing, express their ideas in public forums, and explore these ideas collaboratively while attaining digital citizenship (Alberta Government, 2012).

In spite of research demonstrating the benefits associated with this recent initiative, its implementation has been met with some challenges. Teachers are concerned that students will be distracted and although sites and applications can be blocked some students can navigate around these tools (Concordia University Online, 2013). In addition, challenging the Board’s aim of promoting equal access, implementation of BYOD may further emphasize resource differences between high and low-income families (Concordia University Online, 2013). A particular challenge for teachers in an elementary school setting is that some schools may ban devices among younger students, allowing only older students to bring in their devices to school for classroom use (Concordia University Online, 2013).
Background of the Researcher

During my elementary years, I remember having little exposure to technology. There was no technology use in the classroom by students although we had limited computer time during our computer lab period. I always looked forward to going to the library, where our computer lab was located, to work on some engaging games and activities. I was often disappointed because we did not go very often due to challenges that included time constraints and lab scheduling conflicts. I find it hard to believe that even now some students are receiving the same type of instruction with little to no use of technology in classrooms today. Consequently, as someone who was not able to benefit from technology use inside the classroom in my elementary years and because more opportunities for technology integration of innovative devices such as iPads exist today, I consider it important that teachers should be willing to broaden their teaching strategies to enhance their students’ learning and try to overcome any challenges they face implementing new technologies. Students are likely using a variety of devices outside the classroom, and instead of their use being limited to recreational activities, teachers should strive to show students the educational value of such tools by engaging in meaningful integration. In addition, digital literacy skills are becoming increasingly needed today for many career paths and teaching in ways that integrate these technology skills can prepare students for a demanding job market. As a teacher candidate in the Master of Teaching Program at OISE, I aim to learn from the participants of this study who demonstrate experience in the area of technological integration to enhance my professional knowledge and pedagogy, so that my students are able to experience the benefits of technology use for learning.
Purpose of the Study

This study is important because there is a level of anxiety amongst some educators about integrating technology as well as a misconception that younger educators are better equipped to teach with technology. By outlining participants’ classroom experiences with technology and its integration into their pedagogy, this paper will serve as a guide to those interested in implementing technological strategies in the classroom. In addition, the insight gained from this research study may encourage those who are reluctant to use technology to support learning to begin that journey.

As a result of the challenges associated with the implementation of BYOD and the potential that it holds in educating students in digital literacy and fostering student-centered learning, I intend to explore this relationship further. Therefore, the purpose of this study is to describe Peel District elementary teachers’ perceptions on whether and how, consistent use of the BYOD program in teaching digital literacy creates meaningful learning experiences for students. The results of this study will be useful to educators aiming to enrich classroom learning to enhance digital literacy skills of students. It will also provide information to policy makers of neighboring boards in the Greater Toronto Area who have not adopted the program on how the program attempts to contribute to student learning as well as what supports should be in place to accommodate teachers in their instruction.

The central research question guiding this study is:

How does a sample of elementary teachers working in the Peel District School Board create meaningful learning opportunities through integration of the BYOD program to teaching digital literacy?
Sub- Questions:

1. How are teachers integrating the BYOD program to teach digital literacy?
2. What supports are in place to facilitate use of BYOD in engaging students with digital literacy?
3. What challenges do teachers face in implementing the program for their specific purpose?
4. Does use of BYOD foster student-centered learning?

Overview

To answer these questions, I will conduct a qualitative research study where select elementary teachers will be interviewed based on a predetermined criterion to discuss their strategies and experiences with integrating BYOD into their pedagogy for teaching digital literacy and the impact of BYOD they perceive on student-centered learning. In the following chapter, I review the literature surrounding digital literacy and BYOD as a tool to foster student-centered learning. In chapter 3, I introduce my participants and discuss the methodology and elements of the research design associated with the study. Lastly, in chapters 4 and 5, respectively, I will report the findings of my study and analyze these findings capturing themes connected to the literature and discuss implications of this study.
Chapter 2: Literature Review

Technology and Education

The literature surrounding technology in education is a good place to begin the discussion of literature for the purposes of this study. Rodriguez et al. (2012) claim that for many people, technology refers to computer hardware, software, and electronic devices, and that technology integration involves using this equipment in the classroom. This view is very narrow and can limit meaningful integration of technology for teachers who hold this particular view because it fails to consider pedagogical issues. Meaningful educational reform with technology involves more than just buying technological tools; it goes further by designing teaching strategies that complement the curriculum (Keengwe and Onchwari, 2009). The distinction between technology instruction and integration in education is explored substantially within the literature. Various studies present a multitude of recommendations for technology integration which include installing technology that supports new educational software and adapting instructional technology to suit the learning objectives based on students’ needs (Okoije et al, 2006; Keengwe and Onchwari, 2009). This raises questions about which recommendations are effective and might allow teachers to integrate technology with fewer challenges. A potential way to conceptualize the problem is offered by the Technological Pedagogical Content Knowledge (TPCK) framework. Mishra and Koehler (2006) state that:

TPCK is the basis of good teaching with technology and requires an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology
can help redress some of the problems that students face; knowledge of students’ prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge and to develop new epistemologies or strengthen old ones (p.1029).

A different kind of model of technological integration used by a number of educators within Peel District School Board is SAMR. It was developed by Dr. Ruben Puentedura and SAMR stands for substitution, augmentation, modification and redefinition which describes the different levels at which teachers may utilize technology to design, develop, and incorporate digital learning (Schrock, 2015). As you move up the levels, the technology integration becomes more transformative rather than used as a simple enhancement at the substitution level, for example, where students use Adobe Reader to read an electronic version of their textbook (Schrock, 2015). Teachers can vary the use of each level depending on their learning goals with the technology.

These frameworks are important to understand since this study aims to analyze meaningful integration of the BYOD program for digital literacy. In light of what is known about technology integration as a whole, it will be interesting to see how integration using BYOD is achieved amongst the participants of the study.

**Digital Literacy in Education**

Drenoyianni and Stergioulas (2011) state that, “digital literacy involves the ability to use digital technology, communication tools or networks to identify, evaluate, use and create information” (p.21). This definition of digital literacy highlights the functional aspects of the term, which have implications for the BYOD program. In the classroom, digital literacy is an
important facet of technological use and instruction. It can provide students the opportunity to
develop skills required in a growing technological workforce. The Government of Canada (2014)
explains that “research and international precedent indicate that digital literacy supports
participation, inclusion, and innovation in a knowledge economy” (para. 4). In addition, a device
for every student can enrich learning and provides flexibility through inclusive practices, and
increases student engagement (Alberta Government, 2012). The notion that the device is
personally owned is a rather important aspect of the BYOD program. Benefits of this
personalization include familiarity and transparency with the device, a connection between
formal and informal learning, and social creation of knowledge (Alberta Government, 2012).

Digital literacy as a concept is multi-faceted and the literature shows there is not one
standard definition. Eshet-Alkalai (2004) broadly defines the term as a “survival skill in the
digital era” (p.102). It can be said that a learning of these skills will be further developed by
introduction to recent media as authorized by the BYOD program. As established in the
introduction of this study, the need for digital literacy in education is apparent and its use in
classrooms has been documented in the literature. Hutchinson et al. (2012) conducted a study
incorporating curriculum- based integration using the TPCK framework where the teacher
enhanced print based literacy goals by using iPads to allow students to learn skills associated
with 21st century learning technologies. It was found that students were able to create visuals that
allowed them to communicate digitally with others and accurately express their meanings
(Hutchinson et al., 2012). While this research by Hutchinson et al. (2012) suggests that digital
skills were developed as a result of iPad integration, it was a small scale study done for a period
of only three weeks and the student voice was not considered.
On the other hand, Chricton et al. (2012) conducted their study in classrooms across an urban school district where teachers were using iPod touches and iPads in different phases of instruction. By considering the teacher, students, and IT support staff’s perspectives they found that participants preferred a range of devices for different digital tasks that included using a laptop for searching the internet and creating media (Chricton et al., 2012). They also found differences in regards to age for junior and senior students; “younger students used various apps to create projects ranging from art activities and video games to multimodal presentations (audio and video podcasts). They described great satisfaction with the instant-on capabilities of the devices, their significant battery life, and the variety of apps” (Chricton et al., 2012, p.27). In contrast, they state that “primarily, senior high students desired access to their course texts. When they were able to do this, as in the case of the mathematics class using iPads, they displayed great satisfaction with the flexibility of the digital text” (Chricton et al, 2012, p.27)

These findings are telling because this study will explore digital literacy and BYOD in the context of an elementary school setting. If research shows that age plays a role in how students engage with the technology, this may inform teachers’ perspectives on the perceived impact of BYOD on student-centered learning.

**Teaching with New Media**

Implementation of BYOD requires a close look at the supports needed for its effective use. The program is an exciting initiative with the potential to increase student success and PDSB has invested 7 million dollars to help ensure schools are connected and relevant in the 21st century (Peel District School Board, 2013). The infrastructure required to support BYOD has been explored in the literature. Generally, it is important that a plan is in place prior to
implementation (Alberta Government, 2012). “The plan needs to address wireless technologies and bandwidth, security standards, network policies and procedures, human capital and projections of the total cost of BYOD models (Alberta Government, 2012, p.48). As a result of their study, Chricton et al. (2012) developed a concrete list of considerations regarding the use of mobile technology in learning. They suggest “purchase, investigation and learner appropriateness of the individual applications” used in classrooms and accessories such as syncing carts and cables to support devices (Chricton et al, 2012, p.31). This has implications for BYOD integration because teachers have to decide what applications are appropriate for classroom learning objectives and how to manage students’ devices and their accessories.

There are constant innovations in technological devices so it is important to decide what new media to use in the classroom. Peel District School Board (2013) outlines this information in a guide for parents regarding which type of device they can consider for their child. They maintain that laptops and tablets have fewer limitations in terms of device capabilities in comparison to smart phones and iPods (Peel District School Board, 2013). As previously mentioned, the personalization involved in the BYOD program is an asset. The Peel District School Board (2013) builds on this aspect by discussing the distinction between a school-owned and personal-owned device. They explain that students are usually experts on their device and can customize their learning, their devices are typically more up to date than school devices, and school devices are expensive and may be difficult to sustain (Peel District School Board, 2013).

**Digital Literacy Issues**

As alluded to earlier in this study, if the right infrastructure is not in place the use of BYOD and consequently the instruction of digital literacy in schools can be affected. Another
potential issue is lack of digital citizenship. Digital Citizenship is defined as the norms of responsible behaviour related to the appropriate use of technology (Peel District School Board, 2013). In BYOD classrooms, students should follow school policies on acceptable use inside and outside of the school and understand how to protect electronic data (Alberta Government, 2012). Unacceptable use can lead to challenges for teachers that may affect instruction for some or all students. In their study Fahser-Herro and Steinkuehler (2012) explain limitations placed on technological literacies. They state “district administrators have used concern over online safety and intellectual property rights/fair use, for example, to justify a surge in Internet filters, Internet safety, responsible-use education, and desktop ‘locks’ on computers, creating apprehension in schools”(Fahser-Herro and Steinkuehler, 2012, p.20). They also explain that some view Internet research and resources as attacks on traditional, well-established, static print (Fahser-Herro and Steinkuehler, 2012). Drenoyianni and Stergioulas (2011) discuss the shifting nature of digital literacy. They explain “fundamental changes in technology mean that details concerned with features of digital and media literacy are likely to shift; that shift might mean that some features become easier or redundant, while others are enhanced or arise anew” (Fahser-Herro and Steinkuehler, 2012, p.118). This raises the question, if students are taught specific digital literacy skills to use in the future, what happens if these skills are no longer relevant when they are needed? Eshet-Alkalai and Chajut (2010) explain that there has been a lively discussion in the literature about changes in digital literacy over time. Their study analyzed changes in digital literacy over time for younger and older participants over a period of five years (Eshet-Alkalai and Chajut, 2010). In analyzing the results of their study which looked at the following digital literacy skills: information thinking, branching thinking, photo-visual thinking and reproduction thinking they found that over time there was a significant difference for all age groups in most
literacy skills which suggests experience and not age was responsible for the changes over time (Eshet-Alkalai and Chajut, 2010).

**Student-Centered Learning and Bring Your Own Device**

In the literature the terms ‘student-centered’ and ‘learner-centered’ are used interchangeably. Mahendra et al. (2005) explain that in learner-centered instruction students have more control over directing their own learning changing teachers’ roles from delivering content and having control of the learning environment. Weimer (2002) is an authority on the subject of learner-centered education and has developed a list of five elements of Learner-Centered Education, which include: Shared power between instructors and students, course content as the means to knowledge and not its end, role of the teacher as facilitator, shifting the responsibility of learning, and using evaluation to promote learning (as cited in Mahendra et. al, 2005.)

There is a great deal of literature about the role of technology in promoting a student-centered learning environment. Jonassen et al. (1999) supports constructivist uses of technology and argues that “technologies should not be used as conveyors and deliverers of the designer’s message to a passive learner” (p.218). Hannafin and Land (1997) identify that “technology-enhanced, student-centered learning environments organize interrelated learning themes into meaningful contexts, often in the form of a problem to be solved or an orienting goal, that bind functionally their features and activities” (p.168). Similar to this, Jonassen et al. (1999) suggest that technologies should support meaningful learning where students are actively processing information during authentic tasks. A BYOD model has the ability to shift instruction towards student-centered learning (Alberta Government, 2012). Therefore, teachers may consider a constructivist teaching strategy in implementing BYOD and in regards to what is known about
student-centered learning, the question of how a fairly new model like BYOD is impacting student-centered learning will be explored.

Conclusion

Technological frameworks have been put in place to foster meaningful integration in the classroom and teaching digital literacy is one aspect of integration. Studies have explored digital literacy and the issues associated with its instruction. In addition, teaching with new media such as iPads can foster digital literacy skills and also create a student-centered learning environment. Bring Your Own Device falls within the context of this recent media that has implications for teaching digital literacy skills and fostering a student-centered learning environment. It is how the participants of this study are going about this technological integration of BYOD to teach digital literacy that will be explored further.
Chapter 3: Methodology

Nature of the Research

The methodology employed for this qualitative research study began with a literature review surrounding digital literacy and technological integration. It was followed by interviews with educators from the Peel District School Board who fit the participant research criteria. Creswell (2013) identifies characteristics of qualitative research to include emergent design, participant meanings, reflexivity and a holistic account. These particular characteristics are invaluable to a study like this because it aims to understand the unique perspectives of the participants and their perceived experiences. It also aims to provide a holistic view of the use of Bring Your Own Device in teaching digital literacy and the themes common to all participants. This study draws upon characteristics of a phenomenological research study. Creswell (2013) defines a phenomenological study as “the common meaning for several individuals of their lived experiences of a concept or phenomenon” (p. 76). Consequently, this study examines the lived experiences of a sample of elementary school teachers educating in the Peel District School Board through the use of interviews to understand the essence of their combined experiences.

Participants: Criteria and Recruitment

The participants for this study were three elementary teachers who consistently incorporate technology into the classroom to enhance student learning. The participants were selected through purposeful sampling and were located using referrals from OISE faculty who are connected with Peel District School Board. These participants were selected because they teach within a school board that has fully adopted the Bring Your Own Device Program and they are actively employing technology using the Bring Your Own Device program to teach digital
literacy. The participants in this study are described below and pseudonyms are used to maintain confidentiality.

**Participant 1: Jessica**

Jessica is a grade 3 teacher with the Peel District School Board. She is in her eleventh year of teaching and has taught grade 3 for the past 3 years. She has experienced teaching from Kindergarten to Grade 5 and she became interested in using technology from a young age. She began to use technology in her classroom as a way to address the needs and interests of her students. She runs a technology-related club at her school and has presented the results of the club’s progress at board meetings. In Jessica’s classroom students bring in their personal devices and at times she will sign out the school’s class set of iPads.

**Participant 2: Helen**

Helen is a grade 2 teacher with the Peel District School Board. She is in her twelfth year teaching has taught grade 2 for the last 3 years. Both her Masters and PhD work have a focus in educational technology and in her role she consults for other boards and universities. In Helen’s classroom the students have access to a class set of iPads and students bring in their personal devices to update them and transfer information from those iPads.

**Participant 3: Joseph**

Joseph is a Technology and Inquiry Support Teacher with the Peel District School Board. He has taught for 10 years and has been in his current role for the last 5 years. In the past he has primarily taught grades 6 to 8 and now supports all teachers and students in his school who bring
in their personal devices with the use of technology and teaches lessons to those classes when needed.

**Procedure and Data Collection**

The interviews had a semi-structured format and included both face to face and telephone interviews. The semi-structured format allowed for flexibility in the participants’ responses. Moreover, it provided an opportunity for the participants to be asked related follow-up questions and further elaborate their responses to specific questions. The interviews were audio-recorded using the Android Voice Recorder application to ensure the accuracy of statements made by participants.

**Data Analysis**

Following the completion of the interviews, the audio-recordings were transcribed and reviewed for accuracy. Each transcript was read over multiple times and coded at separate points in time. Once codes were identified, possible themes were outlined for each transcript and data that illustrated a particular theme or code were identified as possible quotes. Once all three transcripts were coded and themes were identified, the common themes between all three interviews were used to inform the findings that will be discussed in detail in Chapter 4.

**Limitations**

There are some limitations involved with this study. First, they include the small sample size; only three interviews were conducted to gather information, thus reducing the generalizability of the study. In addition, because of ethical protocol limitations, only educators
could be interviewed which means that not all voices will be heard in the data, particularly student’s voices.

**Strengths**

Although there are a few limitations, this study also has strengths. By using a qualitative research method, the detailed experiences and insights of participants interviewed in regards to the research topic will be shared with readers, providing thick descriptions of the contexts being examined. In addition, educators who aim to use BYOD in their own pedagogy will benefit from learning the strategies and supports of others involved in those practices. Lastly, as mentioned previously, policy makers in neighbouring school boards can use the findings from this study to better evaluate the potential for the creation of a BYOD policy in their own school boards so that more students can benefit from the practice.

**Ethical Review Procedures**

The ethical review procedures used for this study are those outlined by the Master of Teaching Program. Educators who are knowledgeable on a topic (Teachers, Principals, or Parents) can be contacted for an interview and answer questions about their experiences; they can be contacted by phone, online or in person (UT Office of Research Ethics, 2010). The procedures identify that permission from each of the participants be granted by way of signing a Letter of Consent (see Appendix A). Participants shall remain anonymous and were debriefed on any inherent risks, their right to withdraw from the study at any point, and their right to access the study once completed.
Chapter 4: Findings

In this chapter, I report the research findings that resulted from this qualitative study. The findings are organized into the following five themes, with subthemes reported under relevant themes.

**Theme 1:** The importance of teaching digital literacy to students.

**Theme 2:** Aspects of the learning environment conducive to Bring Your Own Device.

i) Inquiry

ii) Collaboration

iii) Problem Solving

iv) Differentiation

**Theme 3:** Students’ interests as a guide for instructional practice.

**Theme 4:** Access as both a determinant and hindrance to Bring Your Own Device.

**Theme 5:** Fellow educators as a valuable resource in teaching with Bring Your Own Device.

For each theme, I report the pertinent data and include participant voices to demonstrate the results of this study.

❖ **Theme 1: The importance of teaching digital literacy to students**

While each participant had their own definition of digital literacy, all reported that digital literacy should be taught in the classroom to benefit student’s lives. For Helen, in defining the term she explained that students require the knowledge, skills, and behaviours to work with the devices and elaborated on the importance of digital literacy when she stated:
It (digital literacy) basically builds on that foundation of literacy to support the 21st century expectations within the environment right now. Everything is moving towards literacy or digital literacy within schooling systems or it should be at least. But definitely within society, you can’t get a job if you don’t know about this; it’s preparing the kids for that future.

For Jessica, she defined digital literacy as a tool that redefines students’ roles in using technology, specifically with students taking a more proactive role in their use of technology. She explained:

It’s (digital literacy) more about using technology responsibly and learning how you’re not just a consumer of technology but more of a creator; so moving away from just playing games but using things where you’re coding and making your own games. So really having an understanding of what it is and how they can use it to enhance their learning and use it to create rather than consume.

Lastly, Joseph emphasized the need to analyze information and critically engage with the information gathered as he explained that it is about making sense of the huge amount of information available on the Internet and using that information to communicate a message. It is what Joseph said about why he decided to use technology in his classroom that really highlights the importance of teaching digital literacy to his students. He explained:

For my students, it (incorporating technology) was always an interest because it was having them be in an environment where it’s what their future will kind of be about. There’s incorporating technologies and knowing how to use them to their benefit rather than what we always hear young people getting themselves into.

Theme 2: Aspects of the learning environment conducive to Bring Your Own Device

i) Inquiry

In all participants’ classrooms, forms of inquiry based learning were employed and valued when teaching with Bring Your Own Device. Joseph explains that in his school students’
interests are incorporated in teaching the curriculum. In addition, both Jessica and Helen give their students more control over their learning by encouraging students to explore and discover new information.

Jessica explained:

I’m big on asking questions, we’re always asking questions, we have a Wonder Wall and at all times students post their questions and we talk about how not all of our questions need to be answered. Someone posed “do fish sneeze?” and instantly they’re like let’s just look it up and again when they have their own device it’s not me providing the answers, it’s them taking ownership of their questions and figuring it out on their own.

Similarly, when asked whether or not Bring Your Own Device supported her pedagogy, Helen stated:

I think it supports it very nicely in that the students are very comfortable with it and they know exactly how to use it. They teach me half the time different things and what it’s all about, we call it discovery, so if they discover something they have to teach the rest of the class.

ii) Collaboration

Both Helen and Jessica reported that collaboration was a strategy used that supported their use of the Bring Your Own Device program. Moreover, as Joseph explained, in many instances collaboration was a result of students’ working with their devices. Jessica believes that Bring Your Own Device can open the door to collaboration amongst students. She explained that a lot of collaboration can be seen on a typical day in her classroom from small groups to pairings. Helen referred to it as collaborative inquiry and in describing how Bring Your Own Device supports her pedagogy, she stated:

It’s completely collaborative; they’re talking about it and asking for help from each other. My biggest thing is my step back from the students in terms of my
deliverance, I step back and just kind of allow the kids to discover and it does take a little bit longer but, you know, the learning that comes from it, is tremendous.

iii) **Problem Solving**

As mentioned previously, participants found that in collaborating with one another, students were able to solve and answer their questions. In addition, participants found that having students use their own devices meant they were more inclined to use those devices to problem solve and as a result, became more independent.

Jessica stated:

They’re taking initiative to answer their questions and engage in learning and then sometimes if I’m involved with another group or helping another child they can kind of say well I’ll try to solve this on my own using the device.

Likewise, Helen explained:

[When students’ say] I don’t know how to do this, I say well discover, let’s figure it out and once you figure something out, let me know so that we can let the rest of the class know. Their problem solving has come so far and especially for grade twos they’re so young but everything at the beginning of the year is that they need help with everything and the minute you introduce the iPads they learn and you know what they weren’t asking for help anymore because they were confident in their own abilities.

iv) **Differentiation**

As explained in the literature review, in participating in the Bring Your Own Device program, students bring in their own device which means that there is a range of media used in the classroom. In using the program to teach digital literacy, participants explained the need for differentiation. Jessica described students needing to have a big toolkit which means the students know the different applications and programs available to them depending on the device they are
using. She referred to it as the device neutral philosophy, when asked in a follow up question what that was. She stated:

So device neutral, with Bring Your Own Device, you are going to have android devices, apple devices, and different brands, so you have to be device neutral, so you’re not using a program that’s specific to one device. So I wouldn’t say to my students you need to use iMovie because if they have an Android device they are not going to have that capability. If my goal is to do some video with editing, it doesn’t matter what video-editing program they’re using.

Jessica also explained that she differentiates using the program for some students by allowing those who have visual and/or verbal-linguistic learning styles to use applications such as YouTube to collect and organize information.

❖ Theme 3: Students’ interests as a guide for instructional practice

As in any student-centered environment, students’ interests and questions drive the learning that happens within the classroom. All participants reported that their classrooms are very student-centered. Jessica explained that in her class they switch gears a lot depending on the students’ questions of the day. In describing her idea of a student-centered classroom she stated:

It’s really knowing your students and taking a lot of time in the beginning to get to know them and their interests and, you know, planning out lessons and activities that really hook them in with their interests.

As an example of student-centered learning in her classroom, she added:

Right now, I have a group of students who really are interested in origami. So, you know, I pulled out books and I brought out cut up paper and looked at math and geometry and measurement and all those things coming from their interests. We have a class pet and we did a mini-inquiry researching how to take care of our class pet. I also do genius hour. In their genius time, they’re exploring what they’re interested in learning and their researching. It’s three-fold, they have to research it, they have to create a product, and they have to share their product in a global way.
For Joseph, he described a mathematics lesson on decimals in which he taught to a grade 8 class as an example of a lesson that took advantage of Bring Your Own Device and appealed to students’ interests.

He described the lesson as follows:

[Speaking to students] I have this idea, we’re going to do some shopping, it’s Black Friday, I want you to find some good deals and I want you to buy a bunch of stuff, and you have X amount of money.

He proceeded to explain:

So they [the students] had to decide what they were going to purchase, figure out how much it was going to cost them, calculation of taxes and all that, in the end I also wanted them to figure out how much they saved by shopping on that Black Friday sale, so what were the discounts they received. For me, I was looking at could they use their devices to find this information, could they gather the information that was needed in order to do the calculations to figure out, you know, how much money did they save, was it really worth the time they spent searching for all the deals, was it worth actually shopping on Black Friday or was it better just to shop at some other time because they didn’t really save much so, you know, it was an activity that was kind of thrown into everything but it used the students and their devices and also engaged them.

All participants described student interest as an important aspect of student-centered learning and when asked if BYOD fosters student-centered learning each participant reported that they believe it does. In her response, Jessica referred again to the initiative she observes her students taking to solve their problems with their devices which minimizes her role as the holder of all information. In his response, Joseph explained that BYOD allows students to explore virtually anything they like, not being limited to the content provided by books as a way that BYOD fosters student-centered learning. Lastly, Helen explained that the idea of students collaborating and discovering together is how BYOD fosters student-centered learning.
Theme 4: Access as both a determinant and hindrance to Bring Your Own Device

When speaking on Bring Your Own Device enhancing their students’ learning all participants reported that the program allowed for students to have access to a lot more information in real time. Jessica stated that the cart of iPads at her school are popular and they’re not always available and by having students bring in their own device they have them at their disposal to access information, research and create. Joseph explained:

For myself, Bring Your Own Device is great, I mean, I always really pushed it because it supports my ability to allow students to have access to that huge amount of information that is out there on the Internet. It also helped me make contact with parents without having to pick up a phone. It’s also allowed me to go beyond the general 9-3 hours that people think schools operate under and be able to support my students when it comes to their learning, you know, if it were eight o’clock at night and there was something I was asking them to look into for the next day.

In Helen’s classroom, all students can access class work from home. She explained:

We use the facilitated website through the Board, the Bring Your Own Device website, consistently so that the students are able to access their files from home and school. We use Google Drive so anything they’ve created on the iPad they can also access at home as well.

When asked about the challenges faced in using the program all participants stated that lack of access to a device presented challenges for teachers using the program. Jessica discussed the inequality in the program when she explained:

There is always that idea that the playing field is not leveled, so you have children who are able to participate in the program and then those who are not. But the vision with the Board with Bring Your Own Device is that it fills in the gaps. So you have the school based devices and then you have those who are bringing.

Similarly, Helen explained that:
There are students in the class that don’t have computers or technology, like technological devices at home so we’ve set up a club for them at school twice a week, that they come and get help.

Like the other participants, Joseph discussed lack of access as a significant challenge but further elaborated by attributing the lack of access to factors such as socioeconomic differences and parents’ comfort level. He explained:

Just in general the biggest challenge with Bring Your Own Device is where you are in terms of your school and the socioeconomic status of the neighbourhood. Some schools, like some neighbourhoods, families are well off and they certainly have the money to support their children in providing the technology. I mean you’re always going to battle the parents and their comfort level of being able to really trust their child enough to send it with them but then you have those neighbourhoods where the families are struggling to get by from paycheque to paycheque for whatever it might be just to live so providing them with something to come to school with and learn is not really what they’re focused on.

_theme 5: Fellow educators as a valuable resource in teaching with Bring Your Own Device_

While all participants attended technology-related professional development such as PDSB’s *Teaching and Learning in the Digital World* conference. Joseph reported that there is no specific professional development in place for teaching with Bring Your Own Device. However, regarding available supports, all participants recognized Instructional Technology Resource Teachers as a key support for using the program within their classroom. Moreover, it was ultimately the support of fellow colleagues and educators that all participants confirmed was valuable in teaching with technology.

Jessica stated:
Our Board is very active on Twitter so it’s just simply putting out a @ peel schools question and instantly teachers and educators are responding to those questions.

In providing her suggestions about how to meaningfully integrate technology into the classroom, Helen explained:

So suggestions that I give is to go into people’s classrooms that are doing this and see it in action and get some suggestions from people who have been using it from the get go or even just recently and see where that fits into their own current program.

Similarly, Joseph responded:

Sometimes it’s important to see what other teachers are doing and asking them how it’s going and what they’ve done and how they’ve incorporated it in the beginning, reading about how technology is used in the classroom so you can become familiar with it, if you’re not already and again just trying.

Finally, as a piece of advice to educators who may be reluctant to incorporate technology into the classroom, all participants expressed the same sentiment which was to just go for it.

Jessica stated:

My biggest advice is just go for it. Give it a try. If it’s not working for you there are tons of people who can fine tune it and support you with it.

Equally, Helen expressed:

The advice I would give them is go for it because it is one of those things that it’s such an effective device in teaching and what I do at any of my conferences that I speak at is I show them the results from last year. I had kids coming into my class barely reading, they were reading at kindergarten level and 18 of my 22 students left reading at a grade 4 and 5 level if not higher so, you know, it speaks for itself.

Lastly, Joseph shared:

Jump in and give it a shot and don’t be afraid to fail, if it doesn’t work out, then you try it again, it won’t work the first time you do it, not necessarily, so you got to give it a try.
In the following chapter, I will discuss the findings in relation to the literature and the implications and recommendations that come from these findings. In addition, I will discuss potential research that can be done in the future as an extension to this study.
Chapter 5: Discussion

Connection to the Literature

The purpose of this study was to describe teachers’ perceptions on whether and how, consistent use of the BYOD program in teaching digital literacy by Peel District Elementary teachers creates meaningful learning experiences for students. It was reported by participants that the program did produce meaningful learning experiences for students and each participant achieved this in their own way. In analyzing the findings which yielded a wealth of information regarding how each participant specifically uses BYOD to meaningfully integrate technology into their classroom and pedagogy, the themes identified correspond with the information discussed in the Literature Review. Specifically, the following themes parallel and highlight the results of studies discussed in Chapter 2.

- **Theme 1: The importance of teaching digital literacy to students.**

  In discussing digital literacy and its role in education, it was demonstrated in the literature that there are varying definitions of the term. Similarly, this was the case for each participant and though one definition was not more correct than another, it was apparent that each participant’s unique definition guided their practice. For instance, Jessica who viewed her students as creators rather than consumers of technology really created opportunities where her students could demonstrate their creative skills.

  Moreover, the finding that a significant importance is placed on digital literacy instruction by each participant and their desire to prepare students for their future really echoes the sentiment by Eshet-Alkalai (2004) who defines digital literacy as a survival skill in the digital era.
Theme 2: Aspects of the learning environment conducive to Bring Your Own Device.

This study found that inquiry, collaboration, differentiation, and problem solving were all meaningful learning experiences conducive to BYOD and as a result permitted students to expressively engage with the technology. As mentioned, a concern for educators is being able to integrate technology in a meaningful way. That being said, it is apparent that the lessons described by each of the participants of this study go beyond the substitution level as described by the SAMR Model. For instance, Joseph creating a lesson where students learn about decimals in a concrete manner was more than just a simple substitution for pen and paper math problems. He was integrating BYOD to build on important digital literacy skills such navigating, analyzing and evaluating digital information so the students could make informed decisions about what to purchase. Additionally, this lesson allowed students to make real life connections and perhaps learn valuable money management skills in the process.

Furthermore, all participants reported having elements of a student-centered learning environment in their classrooms. It was apparent that each participant’s pedagogy fit a student-centered learning environment by analyzing this finding in relation to Weimer’s five elements of Learner-Centered Education. Specifically, in describing their integration of BYOD into their classrooms; all participants described their experiences facilitating the learning and it was evident from the detailed descriptions of their instruction that course content was student-driven and led to exploratory behaviours on the part of all students. In addition, the findings indicate many instances where there was a shift in responsibility in the learning. For example, Helen’s emphasis on discovery really empowered students to explore and engage with the information so that they became independent in many aspects of their learning. Also, Jessica encouraged students to take initiative and find the answers to their questions thereby giving them more
control over their learning. Although, it was reported that each participant believed that BYOD fostered student-centered learning, it is hard to assess the directionality of this relationship. Did these teachers feel comfortable with BYOD and use it to continue their already student-centered learning approach? Or did BYOD influence these teachers to be more student-centered? These are questions that can be addressed in future research which will be discussed later in this chapter.

- **Theme 4: Access as both a determinant and hindrance to BYOD.**

Many research studies regarding BYOD illustrate the inequality associated with the program in schools. As a result, it is possible to use this inequality to justify not implementing the program. The participants of this study all agree that an inequality exists in terms of some parents’ inability to afford personal devices for their children. However, what was interesting about the findings of this study was that participants explained what was being done in their schools to alleviate the imbalance. While explaining that inequality was a challenge, Jessica elaborated by explaining the Board’s aim to fill the gaps. The cart of iPads available to her class for sign out can be considered an example of this. Helen also spoke about the club that she and her colleagues set up for students who do not have technology at home; it allowed them to complete technology-related homework and assignments.

As a whole this study contributes to the current literature surrounding BYOD by giving a unique look at the relationship between BYOD, digital literacy, and student-centered learning and their implications for education. BYOD is a recent phenomenon and the existing research briefly explores its aim, benefits, and challenges yet this study demonstrates to readers that BYOD can be used as a valuable approach to teach students digital literacy skills and create
meaningful learning experiences. It also examines BYOD’s potential to foster student-centered learning, at least among my sample of teachers. Therefore, this study is unique in that the research focus combines all three aspects in relation to technological integration and learning.

Implications of the Study

For myself, as both a researcher and pre-service teacher, I found this study to be very informative and spending two years working on this study gave me ample time to reflect on the research process. Selecting a research focus seemed easy at the beginning, but I quickly learned that in choosing a focus it needed to be one that was both distinctive and of benefit to the educational community. The completion of this study has also motivated me to explore the new questions that arose from this study which will be discussed later in this chapter.

As a pre-service teacher who is interested in meaningfully integrating technology into my own classroom and whose philosophy of education is grounded in student-centered learning, this study is invaluable to me. Specifically, I admire the dedication each participant has for their students and the effort they put into creating engaging and transformative uses of technology. The findings really provided me with an in-depth look at how using technology for educational purposes really outweighs the challenges associated with it. All participants have encouraged me to integrate technology for student learning and have given me concrete examples to use in my own practice. Specifically, I learned that the access to information that technology affords broadens student knowledge. Moreover, the fact that the participants are not just giving the students the information but encouraging them to inquire and critically engage with information they consider valuable is exciting. One participant explained that a student became very excited when he was able to connect with a business expert on Twitter for insights into a class project he
was working on. I found this very inspiring because it demonstrates to students that they can go beyond the scope of the information provided within the classroom context and extend their understanding on a certain topic.

I also learned that teaching with BYOD supports not only students’ educational growth but individual growth. Jessica described students in her class valuing their peers’ questions and being genuinely interested in helping them figure out the answers to their wonderings. Specifically, in a BYOD learning context, students are able to gain both the content knowledge and digital literacy skills that can prepare them to be successful in the future in addition to valuable work habits and social emotional skills from working with their peers. It was reported by the Government of Canada (2014) that “technology in the classroom can be used to facilitate interpersonal learning between students and teachers and students and peers. It is not intended to replace these essential learning relationships but rather be used to provide platforms for collaboration and tools for organization” (para.10). Moreover, becoming digital citizens exercising the responsibility required for appropriate online conduct is a valuable skill that they can acquire when able to use the program consistently and effectively.

**Recommendations**

**Teacher Education Programs**

Based on the findings of this study, I recommend that all pre-service teacher programs have in place a full-year technology course where teacher candidates are directly engaging with the various technological tools and online educational programs. Moreover, the benefits of cross-curricular integration have been widely reported in the literature and in teacher education programs technology should be incorporated into all courses. This will increase the opportunities
for teacher candidates to build their technological knowledge and digital literacy skills. It will also be beneficial for teacher candidates to have specific training embedded in their technology course on educational software such as Smart and Promethean boards that are found within current school boards. Teacher candidates must also learn about the different frameworks in place to meaningfully teach with technology so that their students can get the most out of technology use in classrooms.

**School Boards**

The findings also suggest that school boards need to have in place supports for educators who are using the program. Supports such as having the right infrastructure are paramount but equally important is the technical support for educators. Support in the form of professional development opportunities and Instructional Technology Resource Teachers who should be readily available to support teachers employing the program. Furthermore, there is a need for professional development sessions that specifically address BYOD in the classroom. This can be content-based; for example, sessions on how to integrate technology for specific subjects, while using a cross-curricular approach or how to teach digital citizenship to students. It can also be technical-based knowledge; for example, demonstrating to teachers how to manage student devices and maintain device neutrality so that each student can benefit from the program.

**Further Areas for Study**

I mentioned earlier in the chapter that a few questions arose out of the completion of this study. Specifically, I would like to know more about what educational programs support BYOD learning. For instance, in her responses to the semi-structured questions, Helen at different points in time spoke about educational programs such as Edmodo, Kid Blog and Quadblogging which
she uses in her instruction. Inquiring about which, if any, tools are conducive to BYOD would enhance my ability to use the program to support student learning in the classroom. With BYOD students are bringing in smart phones or tablets which do not have the same capabilities as laptops and I would like to learn more about which online educational programs have taken these differences into account and have differentiated between the various devices.

Furthermore, the directionality of the relationship between BYOD and student-centered learning was not determined as a result of this study so there is an opportunity to study if a specific relationship exists between them. In the future, both participant observations where participants are teaching with BYOD and an examination of documents such as their unit and lesson plans can provide more insight on this relationship.

In addition, each participant reported that their students were engaged with the technology in the classroom which ties into the finding that all reported using student’s interests to guide their instruction. That being said, I would like to research the students’ perspectives on this matter. Specifically, was it the technology, the content, the inquiry based learning, or other factors that engaged them? This is one limitation of the study, that only teachers’ perspectives were considered. Another limitation was the small sample size which reduces the generalizability of the findings.

Also, participants of this study taught a range of grades and I found it really interesting the level of technology integration that was occurring in participants’ grade 2 and 3 classrooms. Helen explained that all students were directly taught how to use the devices and are very comfortable with the iPads by easily navigating the device and programs they use. That being said, as found in the Chricton et al. (2012) study, age played a role in how students of different
grades interacted with the technology. This goes back to the need for considering student voices in future research regarding BYOD to teach digital literacy.

**Conclusion**

My lack of experiences with technology in my elementary years and the benefits of technological integration in education today have motivated me to conduct this research study. Furthermore, I considered it important to interview participants who were both experienced and motivated to use technology for learning in meaningful ways. Bring Your Own Device is just one aspect of technological integration and participants have advocated for this program to enhance digital literacy and support student learning. As educators, I believe it is important to stay current with educational research and to continue to develop professionally by incorporating the best practices that can improve our pedagogy and students’ growth and learning. I, and many others, consider one of these practices to be meaningfully integrating technology into the classroom and it is unfortunate that due to various reasons some schools still employ little to no technology. I would encourage school boards and educators to try and overcome the challenges associated with technological integration in their schools. A powerful quote by John Dewey illustrates my sentiment; “If we teach today’s students as we taught yesterday’s, we rob them of tomorrow”.

References


doi:http://dx.doi.org/10.1023/A:1002997414652


doi:http://dx.doi.org.myaccess.library.utoronto.ca/10.1007/s10643-009-0341-0


Appendices

Appendix A: Letter of Consent

Date: __________________________

Dear __________________________,

I am a graduate student at OISE, University of Toronto, and am currently enrolled as a Master of Teaching student. I am studying how elementary teachers within the Peel District School Board use the Bring Your Own Device Program to teach digital literacy and whether or not that contributes to student-centered learning. I think that your knowledge and experience will provide insights into this topic.

The purpose of this requirement is to allow students to become familiar with a variety of research methods. My data collection will consist of a 45 minute interview that will be audio-recorded. I would be grateful if you would allow me to interview you at a place and time convenient to you, outside of school time.

The contents of this interview will be used for my research project, which will include a final paper, as well as informal presentations to my classmates and/or potentially at a research conference or publication. I will not use your name or anything else that might identify you in my written work, oral presentations, or publications. This information remains confidential. The only people who will have access to my assignment work will be my research supervisor and my course instructor. You are free to change your mind at any time, and to withdraw even after you have consented to participate. I will provide a list of the interview questions 24 hours prior to the interview so that you may review them. You may decline to answer any specific question. I will destroy the audio recording after the paper has been presented and/or published which may take up to five years after the data has been collected. There are no known risks to you for assisting in the project and a benefit in participating is that you will contribute to current research in the area of technology integration in elementary grades so that your experiences can educate other teachers to learn about teaching digital literacy. I will share with you a copy of my notes to ensure accuracy.

Please sign the attached form, if you agree to be interviewed. The second copy is for your records. Thank you very much for your help.

Sincerely,
Dekka Kireh

Researcher Name: Dekka Kireh
Email: d.kireh@mail.utoronto.ca

Research Supervisor: Clare Brett
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**Consent Form**

*I acknowledge that the topic of this interview has been explained to me and that any questions that I have asked have been answered to my satisfaction. I understand that I can withdraw at any time without penalty.*

*I have read the letter provided to me by ____________ and agree to participate in an interview for the purposes described.*

Signature:

Name: (printed) ____________________________________________

Date: _______________________________
Appendix B: Interview Protocol

Date: ______________________

Start Time: ______________________       End Time: ______________________

Place: ______________________

Interviewer: ______________________       Interviewee: ______________________

Interviewee School Name: ______________________       Interviewee Position: ______________________

Opening:

Thank you for participating in this interview today, your responses will be very helpful to me in completing this study. I would like to remind you that the topic of this research study is identifying how elementary school teachers in the Peel District School Board use Bring Your Own Device to teach digital literacy in a way that fosters student-centered learning. Your responses are confidential and you may choose to not answer any specific question. Also, you may ask for clarification or for me to repeat a question at any time and I will be glad to do so. Are you ready to begin?

Questions:

Can you tell me how long you have been teaching and at what levels?

Can you tell me about your current role and how long you have been in it?

Can you describe what a typical day in your classroom looks like?

How did you become interested in using technology in your classroom?

What does digital literacy mean to you?

In your classroom, what digital literacy skills are most important?

What do you believe a student-centered classroom environment entails?
How does BYOD fit your classroom needs?

Can you describe a lesson that you’ve taught that took advantage of the BYOD policy? What were your learning goals? What did the students do? What indicators of learning did you observe?

In your use of BYOD, in what ways do you find it supports your pedagogy?

How engaged are students when learning with personalized devices?

Does the use of BYOD in your classroom foster student-centered learning? If yes, how? If no, why not?

What supports are available to you within the BYOD program that allow student digital literacy learning to be achieved?

What challenges do you face in implementing BYOD to teach digital literacy?

What advice do you have for elementary teachers who are reluctant to use mobile devices in their classroom to support student (centered) learning?

What suggestions can you give to other educators who are in the early stages of incorporating technology into the classroom to teach digital literacy in a meaningful way?

Closing:

Thank you for agreeing to participate, I appreciate your time. That is all the questions I have for you. Are there any questions you would like to return to and review? Also, do you have any questions for me? I will send you a copy of the transcript and you may verify your responses. Thank you again.