Student Device Use in The Classroom: An Exploration of Peel District School Board’s Bring Your Own Device Policy

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Abstract

This qualitative research study was conducted to better understand the Peel District School Board’s bring your own device policy. This study focuses on teachers’ perspectives of the bring your own device policy: the affect this policy has on students, issues surrounding the policy, and implementation of the policy by teachers on a daily basis. Semi-structured interviews were used to collect data that was analysed and coded into three themes. The first theme focuses on benefits to student learning, including digital citizenship and twenty-first century competencies. The second theme, issues teachers expressed toward the policy, including a negative teacher mindset and inappropriate student device use. Lastly, teacher practices are outlined: specific technologies used in the classroom, teacher collaboration versus professional development, and supports needed by teachers to implement the policy. This research has implications for teachers working with the bring your own device policy, administration staff in a school implementing bring your own device, and Ontario school boards outside of Peel District School Board.

Keywords: bring your own device, BYOD, 21st century competencies, technology education, mobile learning
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Chapter 1: Introduction

1.0 Background and Research Context

Technology is making its way into almost every part of our society’s daily life and the education system is not falling behind. Some schools purchase class sets of iPads for a department that teachers are allowed to use in their classrooms. Others are using interactive whiteboards, either mobile or permanently installed in classrooms, to improve student engagement and learning. However, the greatest piece of technology present in the classroom is in the hands of the students. Mobile devices are an incredible piece of technology with ample possibilities for learning, making use of the internet and various education applications. Although smartphones and tablets alike have many applications in the education world (Lynch, 2016), students may not see it this way. Lives of students are revolving around social media, with the internet at the tip of your fingers it can be very distracting. For quite some time cellphones were not allowed in schools for various reasons, in fact the Toronto District School Board (DSB) had a cellphone ban enforced from 2008 to 2011 (O’Toole, 2011). Phones were thought to be distracting students from learning in the classroom. This was the case for quite some time until educational professionals started to realize smartphones weren’t going anywhere and that perhaps embracing this “trend” would be better for students and teachers alike rather than fighting to keep them out of the classroom (O’Toole, 2011). This presented a paradigm shift in regard to mobile devices in the classroom. They were beginning to benefit student learning instead of being viewed in an overwhelmingly negative regard.

Many schools across Ontario are now encouraging students to bring devices to school with them to use in the classroom. In 2012 Peel DSB introduced a bring your own device
(BYOD) policy that encourages students to bring their tablets and/or mobile phones to use in the classroom (Rushowy, 2012). As of 2012, almost 60 percent of Ontario schools are encouraging students to bring their own devices (Rushowy, 2012). This is overwhelming, as teachers have little to no training in this particular field (Ross, 2013). Some schools in the US are implementing one-to-one programs. This is where the school provides a tablet to every single student in the school. There are various reasons why these policies would be put into place, hopefully, with student achievement at the top of the list. The Peel DSB website, in relation to their bring your own device policy, reads:

Today's students are already technology leaders. They want to take the technology they use in their daily lives and make it a normal part of their classroom experience. Research tells us that if we reflect this in their learning experiences, we will increase engagement which leads to improved student success (Peel District School Board, 2016).

This seems to present an overwhelming interest toward cell phone integration into schools and classrooms in Ontario. On the contrary, there have been studies published (Carr 2012; Kiger 2012) that show quite the opposite. Students in mathematics using iPads daily had no significant increase in test scores. On the other hand, using specific mobile applications designed for mathematics show students using the technology outperformed students not using it. Regardless of success, or lack thereof, these programs are in place and teachers must prepare themselves as the devices are not going anywhere.

1.1 Research Problem

Since the entire Peel DSB is implementing the bring your own device policy as well as many other schools in Ontario, teachers need to embrace this new pedagogy regardless of their
personal opinion or experience. This could pose problems in relation to teachers making use of this policy. Due to the short time period between banning cell phones in Ontario school boards and implementing BYOD policies, teachers in Ontario are going to need specific professional development related to incorporating mobile devices in the classroom. Without this teacher education, teachers will either completely ignore the BYOD policy or they will implement it in such a way that will have no impact on student success. This would be a waste of teachers’ time as well as students’ if they are not benefiting from the devices in the classroom. Teachers must effectively integrate students’ devices into their daily lesson to have a positive impact on student success.

Issues may arise where schools have a large population of students with low socioeconomic status. While it is true that many students have personal devices, not every student has one. If the teachers are relying on every student having their own device, this could lead to equity issues in the classroom. The students could share devices if they belonged to the school, but this may not be so simple when the devices belong to the students. Teachers will also need to revise what are teaching, the learning goals, the success criteria, etc. When the students are problem solving for example, what stops the students from looking up answers online or simply taking someone else’s work? This could create plagiarism in the student’s work without them even knowing which could be problematic later if the students are pursuing higher education.

1.2 Research Purpose

With this problem in mind, the goal of this research is to talk to specific educators using these devices in their classrooms to understand what issues they are experiencing in the
classroom and what practices they employ to overcome them. I plan to bring together teachers’
difficulties to come to conclusions on how to effectively integrate this technology into
classrooms, where to go for help, and how to overcome the hurdles this policy puts on teachers
in the classroom.

I will also explore where teachers can go for education in this specific field. There is a
technology course in some Ontario teacher education programs but there is no specific
curriculum based around incorporating mobile devices. Classroom management skills and
techniques will also be investigated as the dynamic of the classroom will be quite different than
that of a class without mobile devices. Since mobile devices have so many different education
opportunities for students, more specific programs that are working particularly well will be
discussed with teachers as well as applications for students.

1.3 Research Questions

This research seeks to understand how the BYOD policy impacts students in the
classroom. Related to this, how teachers effectively integrate mobile devices into their
classroom. I will also explore some issues related to such a program and how teachers can
overcome them. The opinion of teachers on this policy is also of concern. Perhaps the most
important concern is whether or not the teachers are seeing improvements in academic success or
classroom engagement in their students. Not directly through mark improvement but in a more
holistic sense related to student participation and engagement. Relating to this, is the
continuation and/or expansion of more programs like BYOD in other Ontario school boards
outside of Peel DSB plausible? For a teacher going into this field never before using mobile
devices in their teaching, what should they know and what are some things to watch out for?
1.4 Reflexive Positioning Statement

As someone who attended high school where bringing and using cell phones, laptops, or tablets was discouraged and often forbidden, the bring your own device policy in Peel DSB as well as many other schools across Ontario was peculiar to me. It was foreign to the education structure with which I was familiar. I have also spent time in classrooms in the Toronto DSB as a teacher candidate and have seen mobile devices present in every classroom. I have rarely seen teachers embrace this technology and use it to their advantage. More frequently, I see teachers fighting with students to keep the devices out of sight. As a future educator, I would like to find out how to deal with student devices in the classroom and how to effectively integrate them to better serve students. Also, as a new teacher just starting my teaching profession, I would like to know how and where teachers learn about these types of programs.

1.5 Preview of the whole

To further understand these issues, I conducted a qualitative research study and interviewed two teachers who are involved with the discussed policy. The interviews addressed the integration of the bring your own device policy into classrooms, as well as what the teachers are struggling with and what does and does not work in the classroom. In chapter two, I review the literature on differences in learning outcomes with and without the use of technology, as well as specific difficulties faced with using personal devices in the classroom. In chapter three, I discuss the research design and methodology in more detail. In chapter four, I report my findings and discuss their relevance in regard to the literature review in chapter two. In chapter five I identify the implications of the research and allude to areas for future educational research.
Chapter 2: Literature Review

2.0 Introduction

In this chapter I review the literature in the areas of mobile learning benefits, teacher hesitancy toward the bring your own device Policy, and the barriers presented when implementing BYOD in high school classrooms. More specifically I review themes related to student success and teachers’ inhibitions toward BYOD. I start by reviewing the benefits of a BYOD policy and having technology in schools. I consider the different ways students benefit from BYOD as well as benefits to specific subject areas. From there, I discuss the reasons teachers are not implementing BYOD in their classrooms. Finally I discuss the barriers that exist when implementing BYOD as a high school teacher as well as the benefits to student success.

2.1 Mobile Learning Benefits

Learning benefits are often simply measured in terms of final grades, percentage of students passing or failing, or changes in grades over time (Pinkus, 2009). While these are important for evaluating the effectiveness of mobile learning and BYOD programs, grades are not the main focus of mobile technology in the classroom. Mobile learning has a clear impact on students’ in classrooms but schools will not place emphasis on technology without the positive academic results of extensive research. “Technology for the sake of technology is rarely the goal of a school or state’s decision to invest the requisite funds to provide and support computers for their students and staff” (Bebell and O’Dwyer, 2010, p. 12).

Many studies focus on specific programs developed for a school where the teachers in question were given the resources, knowledge, and technology to implement a program. They rarely report anything other than positive outcomes on grades and student
engagement. Generally, this is not the situation for teachers within schools enforcing BYOD, so I will not discuss these programs. I will focus on more broad uses and results of mobile technology in the classroom. Some different ways of measuring student success will be discussed as well as benefits of mobile technology to specific subject areas.

2.1.1 Measuring Student Success. Integrating mobile devices into the classroom improves students all around behaviour and performance (Drayton, Falk, Stroud, Hobbs, & Hammerman, 2010). Their achievement, quality of work, engagement, thinking, organization, interest and understanding of subject material are all affected by BYOD programs (Drayton, Falk, Stroud, Hobbs, & Hammerman, 2010). Programs like word processors, spreadsheets, as well as internet access provide many opportunities for students not previously accessible. Teachers in a study conducted by Drayton and colleagues state that student academic achievement does not directly improve from these programs but student engagement and motivation are drastically increased by these programs. Having devices in the classroom also promotes student-directed learning. This is important for students not only in the classroom but at home and for other courses. Students are lifelong learners and helping them understand that learning does not only take place in the classroom directed by the teacher is key for students’ success in high school and beyond.

2.1.2 Subject Specific Benefits. For science classrooms, mobile technology provides, with proper school implementation, student access to the internet at all times. Drayton and colleagues state some examples of how this positively affects students: additional content through the use of software, enriched classes and labs by use of simulations, models, and 3D visualization tools, and access to scientific data sets. Teachers report that 33 percent of internet
use in the classroom provided additional course content to the students (Drayton, Falk, Stroud, Hobbs, & Hammerman, 2010). Most of this content was in the form of text, images, and videos for students as a supplement to their text books. Interactive animations and applications are also used for enhanced student understanding of concepts in chemistry, biology, and physics. Mobile phones are also used in labs for data collection and analysis. This may provide an alternative to taking data by hand and analysing it later in a computer lab or at home by the students (Drayton, Falk, Stroud, Hobbs, & Hammerman, 2010).

In social science and English classrooms, the benefits are very different from those in wifi enabled science classrooms. Since these courses often involve inquiry and research, devices have a significant impact in these classes. Bebell and O'Dwyer (2010) state that students’ research skills are drastically improved through the use of devices in the classroom. Although this is not directly tested or measured on tests for example, this is a skill students will use throughout their high school and post secondary education. Select schools in the United States implemented one to one technology programs where schools purchase tablets for every student (Suhr et al, 2010). Statistically significant improvements on state English Language Arts tests (ELA’s) for Grade 7 students were found in comparison to a class not using the one to one technology program. Other benefits were found, “in the areas of literary response, analysis, and writing strategies” (Suhr et al, 2010, p. 38). Since devices are so prevalent in the lives of both students and adults, digital literacy is essential for students to learn at a young age.

2.2 Hesitancy Surrounding BYOD

Although there is growing interest in technology in schools, and an overwhelming amount of research to support its success, in some cases research suggests quite the opposite.
Kalloo and Mohan’s (2012) study shows that research does not support student learning in the classroom and Ross (2013) states that teachers are still not convinced mobile learning will be effective in their classrooms. One can imagine many reasons not to allow students access to mobile phones in classrooms, let alone promoting their use in class. As Ross (2013) suggests, teachers have many reasons for not wanting the mobile phones including student access, professional development for teachers, and internet safety.

A study by Kalloo and Mohan (2012) sought to find out if student achievement was affected by mobile learning. A mobile learning application was created for different groups of students learning mathematics in Trinidad and Tobago to determine if mobile devices can aid in learning mathematics. The application provided access to different types of learning such as reading, games, videos etc., to cater to students’ different learning styles. Participants consisted of three groups of students: two groups of students who had previously learned the content, and one group of students who did not. The students who had already learned the material used the mobile learning software to determine if it would augment their performance in the subject area. The third group of students were learning the material for the first time, and using the mobile learning application as a supplement. Both groups of students who had previously learned the material showed statistically significant increases in performance after being exposed to the mobile learning technology. The third group of students who were learning for the first time with the use of mobile learning did not perform any better than a control group learning the same material without the use of mobile learning technology (Kalloo & Mohan, 2012).

Two things come from this, first that mobile learning did improve student achievement, but secondly, that it only happened in a specific situation. The students whose performance
increased with the use of mobile technology had already learned the material and were being re-exposed to it. This means they had a second chance at working with the material and had more time to process, learn, and retain the information. Although mobile learning did make a difference, this situation does not mimic the classroom accurately. Students did not have a chance to retake tests after learning the material for a second time. They learned the material in a manner similar to that of the third group. With or without the use of technology, they are evaluated, and they move on to new material. The results of the third group, which did not show any change in achievement with the use of mobile technology creates a dilemma. Students learning content for the first time in the classroom is a very typical, if not universal, context in Ontario schooling. If student achievement is not changed by having mobile devices in the classroom, then for what reasons are so many educators incorporating mobile devices into classrooms and lesson plans?

The above issue is alluded to by teachers in a study conducted by Ross (2013) on teachers using mobile devices in the classroom. The scope of the study is quite small, as it only interviewed teachers at a single school in the US, but the study has a wide range of subject areas, interests, and successes in regard to BYOD implementation. Teachers reported common reasons as to why they were not implementing mobile devices in their lessons. They grouped these reasons into three main categories of concern: lack of time for teachers, access for students, and dealing with off-task behaviour.

An issue of time came up frequently among teachers. They reported things like: “I think if I had more time I’d be actively looking [for technology resources]” and, “I think we’re so inundated with everything that’s changed in this state and in education that teachers don’t have…
the time... to try something new” (Ross, 2013, pp. 93-94). Ross (2013) argues that the teachers do not have a lack of time for learning about new types of technology, but rather they do not believe in the efficacy of mobile learning. More specifically, teachers do not trust or believe the information they are receiving about mobile learning. If a teacher does not believe in a particular teaching strategy, they will have trouble putting their own time and effort into the implementation of such devices. However this is not the case for all (Ross, 2013). This leads to an issue of why the teachers do not believe in the technology. Do they not understand it, have they never been convinced of its importance, or is there another reason entirely?

Other teachers in the same study reported issues of student access as the main reason they were not devoting more time to incorporating mobile devices into their lessons. One teacher states, “It’s been like hit or miss as far as maybe two thirds of the class will have computers or three quarters of the class will have computers on a day. So I would give them technology assignments, but I wasn’t relying on it every day because a lot of them didn’t have it” (Drayton, Falk, Stroud, Hobbs, & Hammerman, 2010, p. 40).

Teachers do not want to force students to use their devices and have some students not able to participate due to lack of funding. One teacher mentions sharing the devices, “...if a student doesn’t have that tech, there’s always a student at that table with that tech, so they can share.” (Ross, 2013, p. 97). If this is the only solution and students are sharing devices, are the benefits of one to one technology lost? Although it is a spur of the moment solution, it is only temporary. If students do not all have devices, then teachers cannot make learning heavily linked to the devices or some students will miss out. I believe this means the level of integration of technology in a classroom is linked to the access of students. The school in question reported 212
of 417 students in the school had their own mobile device (Ross, 2013). This is especially alarming as the study was completed in a high socioeconomic status neighborhood. So in a region with lower socioeconomic status, I assume the issue of student access to be even worse. On the other hand, Ross states that mobile devices were more frequent with teachers who were incorporating them into their lessons. This implies a correlation between teacher interest and students acquiring mobile devices.

The last common reason teachers stated they were not incorporating devices into their lessons was the fear of off-task behavior in class and how to deal with it. Here lie some of the key reasons why this program has only recently been introduced. Cell phones were banned in schools for many reasons, mostly all seated in educators’ perceptions of cell phones having a negative impact on students (Thomas, 2013). Phones can be used for cheating, sharing inappropriate photos or information, and most importantly, students can be completely disengaged with the lesson and distracted (Thomas, 2013). This is the reason mobile technology has such a bad reputation among teachers without experience with mobile technology. The way teachers combat these misuses are of utmost importance to teachers new to BYOD policies.

According to Ross (2013), some teachers reported strategies to deal with this issue. One teacher reported they made a student-written policy for mobile device use in their classroom that contained both appropriate and inappropriate uses. This seems effective and fair, as the students come up with the contract themselves. The teacher claimed this created a conversation among students but in the end, the issue was not resolved. Commonly teachers reported a “take out put away” system in which the teacher communicates when the devices are allowed to be present. One teacher states that sending or reading a text is very different than a student staring at their
phone and being completely disengaged (Ross, 2013). Others say that most adults have phones on them all the time, and need to decide whether or not it is appropriate to use it depending on the situation; the teacher extends this idea to students. Students need to learn when it is and is not appropriate to be texting or using their mobile device (Ross, 2013). This thought process is progressive, in putting the onus on the student to be a respectful and responsible citizen, but this raises an issue of what the students are learning with the mobile devices. Are teachers using them so students understand how to be responsible technology-informed adults, or are the devices simply being used to augment the delivery of the curriculum? Expanding on this, if the school is encouraging students to bring their devices and encouraging teachers to incorporate them, is it the teacher's job to educate students on safe and respectful use of mobile technology or does that fall onto the school administration or the parents?

2.3 Barriers that Arise

There is clear motivation for having mobile phones in the classroom, but this does not mean there are no barriers to implementing mobile devices in schools. The hesitancy of teachers outlined above begins to show teacher’s resistance to the implementation of mobile technology in classrooms. Teachers are potentially at the forefront of mobile education as they are the ones working with it directly in schools. Specific issues come up when a program like the bring your own device policy is implemented. Some barriers include but are not limited to the professional development available for teachers, financial constraints of students and parents, technical issues, students not taking tasks seriously, and lack of student interest.

2.3.1 Professional development. Bebell and O’Dwyer completed a study on one to one computing and state: “effective use of technology is a prerequisite to any realization of positive
educational outcomes resulting from [one to one] computing resources” (2010, p. 8). These studies considered the effects of one to one computing programs in select schools in the United States that had purchased a laptop for every student. This is similar to bring your own device, with every student having access to personal devices, but the mobile phones or tablets are replaced with laptops provided by the school. The function of the technology is similar minus the issue of commonality among devices, and the lack of access for students. The effective use of mobile technology in classrooms is also a prerequisite to any positive educational outcomes. However, this is a problem if the only way to convince educators of the power of such a program is through measured academic gains.

Teachers need to be effectively implementing lessons with the use of mobile technology before positive effects on students can be realized. Bebell and Kay (2010) also mention the importance of teachers in the success of mobile technology in classrooms, stating: “it is impossible to overstate the power of individual teachers in success/failure of [one to one] computing” (p. 47). Realizing that the full potential of mobile technology in classrooms is heavily dependent on the successful implementation by teachers, and the power of individual teachers is immeasurable for program implementation. Teachers need to be informed on how to incorporate students’ devices into their lessons successfully. This leads to the availability of teacher education in the field. Perhaps it occurs in technology courses in teacher education programs, or more likely, it occurs in professional development of teachers. Many schools in Ontario have required professional learning communities (PLC’s) within schools to expand teacher knowledge and professional practice. Optionally, teachers can attend professional development. Whether or not teachers attend these programs, or if the programs in particular
locations include education on mobile learning, is unknown and depends on the school and district. In Ross’ (2013) study, the school offered PLC’s within the school that did not contain information about BYOD or mobile learning. However, the school district did have optional professional development offered in both BYOD and mobile learning. Of the 28 teachers that participated in the study, only two reported attendance to the professional development. Teachers do not solely improve professional practice from professional development but it is key when implementing new technologies teachers are not comfortable using. Reasons for the lack of attendance to professional development are not reported but are likely related to the hesitations toward BYOD mentioned above.

2.3.2 Technical barriers. No technology in the classroom will work without technical flaw regardless of what it is: be it projectors, classroom computers, or mobile phones. Some specific technical issues arise with BYOD in terms of student-owned technology. Gedik et al (2012) state that the main technical issues that arise are related to the lack of uniformity in the students’ devices as well as the content delivery system used by the teacher. Because students own the devices, they are of varying types of phones and tablets with a vast array of functionality and availability. The study found that not all devices owned by the students could support the software chosen for the content delivery whether it was a specific application for the students to download or a web based program. If the student's device cannot support the software then they are left out of the activity. Since the teacher is implementing the lesson, they need to become the expert with the technology in the situation. If students cannot figure out how to use their device for the chosen activity, the teacher has to help them. This leaves a great deal of uncertainty for
the teacher in planning elaborate mobile learning activities knowing some of the students’ devices will not be able to support the content.

Some activities, like taking photos or recording, can be used directly on the devices without the use of internet, but when internet access is required to download content or to do research online, wireless connectivity is key. In some schools this can be unreliable making a planned mobile learning activity inaccessible to students and teachers (Ross, 2013). Students are not expected to have mobile internet on their devices to participate in teachers lessons, therefore a wireless internet connection in schools must be accessible in all classrooms.

2.3.3 Student access. Outlined above in the discussion of teacher hesitation, bringing students’ own devices into the classroom and incorporating them into teachers’ lessons has an obvious disadvantage for students that do not have a device to use at school. When students’ do not have devices, teachers need to improvise, letting students share devices or making device use optional. Ross (2013) states that teachers did not suggest any ways of overcoming the issue of student access aside from sharing devices.

Some schools are implementing programs where the school provides devices for students. As mentioned above, certain schools in the United States are implementing programs where a device is purchased for every student. Certainly not all schools have funding for this kind of programs or they would be more prevalent based on the success of the one to one programs (Bebell & O’Dwyer, 2010).

2.4 Conclusion

In this literature review I looked at how students benefit from a BYOD policy, teacher hesitancy for student device une in the classroom, and barriers that arise from BYOD programs.
This review highlights the importance of teachers when it comes to incorporating mobile devices into lessons and, and discussed teachers perspectives extensively. It also raises questions about the extent of professional development for teachers in regard to mobile learning, and points to the need for further research in the areas of professional development for teachers, specific resources teachers are using, as well as ways of dealing with common barriers related to incorporating mobile devices into lessons. This also lead to a question of internet safety and respectful device use. In light of this, the purpose of my research is to learn how teachers are overcoming these barriers so that future teachers have a starting point when working with a BYOD program.

Chapter Three: Research Methodology

3.0 Introduction

In this chapter I describe the research methodology used in my study. I begin by describing the research approach and procedures, as well as the instruments for data collection. I will discuss the participants and the criteria used for finding them, as well as provide short biographies for each. I describe data analysis procedures I have chosen as well as review the ethical procedures of the study. I briefly discuss the strengths of my study and why it is appropriate along with the limitations associated with it. Finally I conclude with a short explanation of my methodological approaches and my rationale behind them considering my research purpose and questions.

3.1 Research Approach and Procedures
This study was conducted using a qualitative research approach, including a review of the literature and semi-structured interviews with two Ontario teachers. Qualitative research is defined as “a methodological research approach that allows the researcher to use the informants' own words to more fully understand his or her thoughts and feelings about the subject of interest” (Saddler, 2008, p. 3). The debate on whether to use qualitative or quantitative research methodology raged through the 1980’s but literature about the usefulness of qualitative research methodology has evolved vastly since then (Manning, 1999). I will not defend the usefulness of qualitative research in comparison to quantitative research methodology, but rather let it stand on its own as a valid research approach. Manning (1999) states that the value of qualitative research is reflected in the lack of comparison of pros and cons of each research method. Therefore I will let qualitative research stand on its own merits. Data collected in qualitative research can identify any deviant cases, as well as, “provide an illuminating picture of the subject, with great attention often given to pointing out intricate details” (Carr, 1994, p. 4). This is important when studying such a broad topic, especially one that has a different effect on all teachers involved. Marshall (1996) states that “qualitative studies aim to provide illumination and understanding of complex psychosocial issues and are most useful for answering humanistic ‘why?’ and 'how?' questions” (p. 1). The perceived usefulness of the bring your own device policy in Peel DSB is a rich and intricate subject that has very different perspectives from teacher to teacher. A qualitative research approach was appropriate here to illustrate a detailed outlook, from the perspective of teachers, on the policy. Carr (1994) also states that, “there are fewer threats to external validity because subjects are studied in their natural setting and encounter fewer controlling factors” (p. 5). This is particularly important as the experience of the teachers was of value to this research.
The teachers in question felt safe in their natural environment, opened up about the issues at hand, and were honest about their experiences in regard to the subject.

3.2 Instruments of Data Collection

Crabtree & DiCicco-Bloom (2006) state there are three types of interviews in qualitative research: unstructured, semi-structured, and structured; although structured interviews usually lead to quantitative data. Unstructured interviews can be regarded as a guided conversation and are usually involved with note taking and observation over long periods of time (Crabtree & DiCicco-Bloom, 2006). “Semi-structured interviews are often the sole data source for a qualitative research project and are usually scheduled in advance at a designated time and location outside of everyday events” (Crabtree & DiCicco-Bloom, 2006, p. 2). I used semi-structured interviews organized around a set of questions I prepared beforehand. Semi structured interviews can be individual or in groups. In order to delve deeply into the personal experiences and feelings toward the bring your own device policy and how it is affecting the classroom, I conducted personal interviews (Crabtree & DiCicco-Bloom, 2006). The interview protocol was based around different themes such as: the participants personal comfort level with technology use, how they facilitate technology use in the classroom, how they think it is affecting students’, and their involvement in professional development.

3.3 Participants

In this section, I discuss all methodological decisions related to sampling criteria and recruitment procedures. This includes the criteria for recruiting teachers in my study, who the teachers were, the experiences they had, as well as different avenues for recruiting participants.
for this study. I will elaborate on the ethical considerations in regard to teacher recruitment and I conclude the section with biographies of the participants involved in the study.

3.3.1 **Sampling criteria.** The following criteria will be applied to teacher participants:

1. Teachers will be working in the Greater Toronto Area.
2. Teachers will be working in a school that in enforcing a bring your own device policy.
3. At least one teacher will have three or more years of experience working with the bring your own device policy or similar program.
4. At least one teacher will have fewer than three years of experience working with the bring your own device policy or similar program.

Due to the small selective sample I used in this study, I wanted a wide range of experiences working with the bring your own device policy in Ontario schools. I interviewed teachers in the Greater Toronto Area for simplicity, as this is where I was situated and I wanted the participants to feel comfortable in their own space when the interviews took place. I wanted one participant to have been working in an Ontario school, preferably the Peel District School Board, since before the bring your own device policy was put in place and when schools were actively banning students from using cell phones in class or have them in school at all. This was to get a picture of the evolution of cell phone use and how the participant perceived the differences before and after.

3.3.2 **Recruitment procedures.** There are three general approaches to sampling in a qualitative study: convenience sampling, purposeful sampling, and theoretical sampling
Convenience sampling is the simplest approach. It is the most cost effective for the researcher but can lack in rich data findings. Due to the restricted sample size I used and the need for teachers with specific experience for my research questions, I did not employ the convenience sampling method. Theoretical sampling method and purposeful sampling are prevalent in most qualitative studies (Marshall, 1996). Purposeful sampling involves selecting a specific group of participants that you believe will be able to answer the research questions at hand (Marshall, 1996). Theoretical sampling is rooted in the fact that qualitative research is an iterative process. After interviews are conducted with participants, you could be led in a different direction than before, to address these new questions you did not previously consider, different participants may be selected later that were not initially considered. I used the purposeful sampling method due to my small selection of participants, as well as the fact that a random selection of teachers would not be able to answer questions I have about the bring your own device policy. The snowball sampling method was my preferred choice of selection. I was looking for both experienced and inexperienced teachers in the field. However when I found teachers with the experience mentioned, unfortunately they were not able to direct me to other teaching professionals in the field due to time constraints.

3.3.3 Participant biographies. Abi is a teacher at a secondary school in Peel District School Board. She has been teaching in Ontario for sixteen years. Three of those years have been in a school that enforces the bring your own device policy, and she is currently the head of the Mathematics Department in her school. Abi teaches secondary mathematics and is integrating student devices in all of her classes.
Ilana is an elementary school teacher in Peel District School Board. She has been teaching various grades over the last ten years. This year she is a planning time and support teacher running a Science, Technology, Engineering, Arts, and Math room for students ranging from Kindergarten to Grade five.

3.4 Data Analysis

After conducting interviews with my two participants, I transcribed each of them. With these transcriptions, I coded each interview to condense my data into three themes. In a qualitative research study, Creswell (2007) states that researchers use inductive data analysis to build categories and themes from the bottom up. The researcher starts with general information and gets increasingly more abstract as the data gets divided into themes and sub-themes (Creswell, 2007).

Following this approach, I coded interviews, categorized, and recategorized data until my coding was complete and the data was organized into three themes. In doing so, I compared interviews to seek out similarities and differences in interviewee’s opinions, experiences, and perspectives. I then interpreted the data in relation to the literature I analysed in chapter two.

3.5 Ethical Review Procedures

Three themes of ethical considerations in qualitative research include: minimizing the risk to participants, protecting the participants’ identity, informing the participants of the nature of the study, and the risk of exploitation of interviewees. These four themes all relate to the safety and consideration of participants in qualitative research.

A potential risk when undertaking an interview is triggering an emotional response in the participant. Even when the interview protocol is sent to the participant in advance, the way the
interview progresses can trigger an emotional response in the participant (Crabtree & DiCicco-Bloom, 2006). Due to the nature of this study, there was no foreseen harm to the participant related to the content of the interview, or the potential experiences the participants were reflecting on. To minimize any unforeseen risk to participants I sent them a copy of the written interview questions ahead of time.

The privacy and autonomy of the participants was a leading ethical consideration. “Current international legislation to protect personal privacy (autonomy) restricts unconsented access to personally identifiable data.” (Pollock, 2012, p. 4). This means that no one outside of myself and my research course instructor were able to access the audio recording of the interview or the written transcript of the participant. All of the files were kept on my password protected computer and will be destroyed after five years. The participants were each given a pseudonym when discussed in chapters four and five. The participants’ identities were kept confidential throughout, therefore any personal identifying markers such as school name or location were omitted.

The participants had the right to withdraw at any time during the study, and with this right comes the responsibility to inform the participant of the nature of this study (Crabtree & DiCicco-Bloom, 2006). This was enforced by sending a letter of consent for the participant to agree to be interviewed and audio recorded. Later, after the interview was transcribed, the participant had the option to review the transcripts to clarify or retract any statements before I proceeded with data analysis.

3.6 Methodological Limitations and Strengths
Any methodological decisions made during research have limitations and strengths related to participant selection, sample size, and data collection. These three choices I have made lead to both methodological strengths and weaknesses.

The limited number of participants in the study is a weakness. Two teachers will inform me of their personal experience with bring your own device policies, but will not lead to generalizable results. The participants I have chosen are all teachers who are informed on the topic of mobile learning, and bring your own device policies, but their perception is not the only one that is important. The students’ are the ones being affected by this, so their opinions, and performance, would greatly inform this area of research. The parents of these students would also be a great source of secondary information. However, I only interviewed teachers which lead to a single viewpoint on the topic.

The data collection was done using semi-structured interviews. This is very important to the topic, as I am not only interested in grades, or academic performance of students, but also how teachers feel the classroom is affected as a whole. Ivey (2012) states that “Qualitative approaches provide not only answers to researcher’s questions, but also the participants’ feelings, perceptions, experiences, and thoughts about the question” (p. 1). I believe this was accomplished during the interviews, and the participants’ experiences and perceptions lead to a broader understanding of the topic.

3.7 Conclusion

In this chapter I went into detail about all of the methodological decisions made throughout my research. I began by introducing qualitative research and the benefits of the method I chose. Semi-structured interviews were discussed as the source of data collection and I
elaborated on their efficacy in my research area. The interviewees were introduced with brief biographies, as well as my recruitment criteria. I used purposeful sampling, and attempted to use snowball sampling, to find my research participants. I described how the data I found is analyzed later in chapter four as well as review the ethical considerations for the participants such as the right to back out of the study at any time and a letter of consent for the participant. Lastly I discuss the strengths and weaknesses of this study. Next, in chapter four I report the research findings.

Chapter 4: Thematic Analysis

4.0 Introduction

The purpose of my study was to investigate how a bring your own device (BYOD) program functions in a school and what teachers are doing on a day to day basis. I also explored teachers’ perspectives on how this policy is benefitting students’ education and some potential issues surrounding this policy. This goal was reached by conducting two semi structured interviews with teachers working in schools that had a BYOD policy. My first participant, a secondary teacher working in the Peel District School Board (DSB) who will go by the pseudonym Abi. My second participant was also working in the PEEL DSB and will go by the pseudonym Ilana. Teachers participated in roughly one hour interviews and discussed their experience working with the BYOD program present in their school. The interviews were recorded on my personal device and transcribed into word documents.

I analysed the transcriptions to find recurring themes across participants’ experiences. These themes were split into multiple sub-themes to discuss specific ideas and experiences
surrounding the BYOD policy. The analysis will be divided into the following three themes:

1. Benefits of a BYOD Program
2. Issues Surrounding a BYOD Program
3. Teacher Practices

The benefits and issues of BYOD programs aim to address my main research question directly. Students experience both positive and negative effects from this policy. The first two themes outline these as well as difficulties teachers face. The third theme seeks to address what teachers are doing on a daily basis and their overall feelings toward the program. This will include both how teachers are making these positive benefits available to students, and how they are overcoming some of the issues mentioned. I will also discuss some specific strategies they are implementing to support students learning in this type of environment.

This research is meant to provide an extensive investigation of what a BYOD program looks like in a school. It can be a starting point for new teachers interested in working for a school that has a BYOD policy, or it could help educators that are curious about BYOD programs with little to no experience. This research is also meant to provide a big picture understanding of how they are implemented in schools on a day to day basis.

4.1 Benefits of a BYOD Program

I will begin the analysis by exploring the benefits that were outlined by teachers and comparing them to the benefits discussed in the literature review. I will start by revisiting 21st century competencies such as problem solving, collaboration, and creativity outlined in the 21st Century Competencies Ontario Ministry document (Ontario Ministry of Education, 2016). I will
also analyse the importance of digital citizenship for youth and its place in school. My participants had different experiences which I will compare and relate to research. Strategies my participants used will be explored as well as difficulties they encountered.

4.1.1 21st century competencies. Both of my participants reported a main benefit of having a BYOD program in their school was the incorporation of 21st century competencies into their teaching. Although my participants did not differentiate between skills and competencies, I will provide my insights into their explanations of why building 21st century competencies in students is important to them.

Ilana describes how access to information has changed what we value in students entering the 21st century:

“YOU and I both know that you can look up pretty much anything you want on the internet. The skills that kids need to know, I believe, are more analytical and critical skills, the idea of experimenting and testing and being able to look at media in a critical way”.

She goes on to describe that not all teachers have gotten to that point, but having student devices in the classroom has broadened her scope of classroom activities that can contribute to cultivating these skills in her students. Ilana also alludes to Peel DSB’s emphasis on 21st century competencies. In fact, both participants mentioned attending Peel DSB’s conference on building 21st century competencies in students which I will discuss later.

Up until this point, I have been using the terms competencies and skills interchangeably with little explanation but I will formally differentiate the terms now. The Ontario Ministry of
Education differentiates skills and competencies with the following: “A competency is more than just knowledge or skills. It involves the ability to meet complex demands, by drawing on and mobilising psychosocial resources (including skills and attitudes) in a particular context” (Ontario Ministry of Education, 2016, p. 9). Both of my participants reported that the BYOD policy helped them build 21st century skills in students, but I believe they were both referring to these larger overarching competencies the Ontario Ministry of Education is talking about: critical thinking, communication, collaboration, and creativity. While using devices in the classroom, students learn about both course content and technology skills, but also how to apply these skills in a variety of ways not initially obvious. For example, Ilana implemented technology called Makey Makey where students build electric circuits using everyday objects they encounter. An example of this would be circuit building technology Ilana implemented in her class called Makey Makey. Students can create circuits and learn about electricity, they can understand how the technology works, but they can also create electronic devices that send information to their device. This is just one example, but I believe teachers integrating student devices into their lessons in a creative way can promote authentic learning opportunities to support 21st century competencies that were previously inaccessible to students in a classroom without a BYOD program.

Abi reported that student devices provided opportunities for her to foster 21st century competencies in her students. She found BYOD especially beneficial for students in her senior level Math courses because students were more willing to explore with technology on their devices. However, Abi reported having difficulty integrating student devices in all grades due to maturity level of students using their personal devices as educational tools. This leads to my next
topic of the importance of digital citizenship for students working with a BYOD program.

4.1.2 Teaching digital citizenship. If school is the place where youth in our society are being prepared for the real world, then I believe digital citizenship is something that should be included in our education system. Ross (2013) states that adults need to be able to control their online presence, and understand when it is appropriate to be using technology in the real world. We are preparing students for the real world and I believe this digital citizenship piece should be a part of students’ education. This topic is mentioned in Ontario’s Physical and Health Education curriculum (Ontario Ministry of Education, 2015), but rarely appears elsewhere for students. Having a BYOD policy in your school can bring professional online communication to the forefront of a student’s education which can provide a perfect learning opportunity for digital citizenship. One of my participants was teaching at an elementary school with a BYOD program and did just that.

Ilana was the leader of a Science, Technology, Engineering, Arts, and Math (STEAM) room at an elementary school encouraging BYOD. She would get to spend time with students from Grades one to five to learn about technology in a creative student centered environment. Since Ilana was working with such young students, she believed that digital citizenship was important and would start the year with classroom rules based around digital citizenship. The students in her class would be interacting online frequently with each other's’ work and she wanted to ensure this was done in a respectful way. Google has a selection of videos aimed at digital citizenship so that is where she started with her students. She got them to understand the risks around having an online presence and the importance of respecting others online. Ilana and her students agreed to a set of rights and responsibilities centered around using technology in her
class. She claimed that when students acted out of line they understood why it was bad as opposed to just knowing they shouldn’t be acting that way. Weinstein (1999) states just that: developing rights and responsibilities with students teaches them that there is a reason for rules to be in place rather than simply having rules that forbid students from doing certain things. Ilana reported very few incidences of students misusing their devices in her space and I believe this is inextricably linked to the fact that she specifically addressed digital citizenship with her students.

Developing responsible and respectful digital citizenship is important for students success in school, and their future. Having a BYOD program encourages professional interaction with peers online and provides a platform for teachers to educate on the importance of digital citizenship. Without this education, students could abuse their online presence and not understand why it is wrong. This could be a problem in later years when teachers don’t have the tools to educate students on this matter, or assume they already have this knowledge from younger years. I believe a successful BYOD program will require digital citizenship education, and without it, could lead to problems in the classroom. With this in mind, I will now discuss some other issues teachers mentioned in relation to implementing a BYOD policy in their classroom.

4.2 Issues Surrounding BYOD

Now that the benefits of a BYOD program have been outlined, we were made aware of a potential issue with digital citizenship. I will now discuss underlying issues related to students having their own devices in the classroom that my participants eluded to in their interviews. I was expecting to hear things related to professional development and time management
mentioned by (Ross, 2013), or that it has no impact on student success (Kalloo & Mohan, 2012) but I did not. I will explore issues related to the reliance of rote learning in some schools, teachers’ attitudes toward the program, and inappropriate use of student devices in the classroom.

4.2.1 Ingrained rote learning culture. Participants I talked to about their school climate communicated similar circumstances related to teacher interest in BYOD. They were both leaders in their school when it came to integrating student centered technology into the classroom and they both reported little interest and/or support from other teachers in the school. Both teachers spoke of this “culture” in schools of rote learning and a lack of authentic assessment opportunities and higher order thinking skills. I will discuss my participants' experiences working with colleagues in their schools and strategies they used to overcome barriers they encounter.

The importance of higher order thinking skills was outlined above with Ilana’s explanation of 21st century competencies in students. I expected this to lead to a conversation on how the school is working together on how to obtain these goals for students but that was not the case. Abi discussed the opinions of other teachers at her school saying, “it’s a distraction, teachers don’t like it. Most teachers don’t like BYOD policy”. This is unfortunate, but not surprising with what we learned from Ross (2013) discussing the reasons why teachers don’t want to work with this program. Ilana described having a difficult experience working with other teachers:

I have found it challenging to work with other teachers… there are a few that are forward
thinking and are willing to collaborate but there are others that don’t even see the benefit of technology and they’re not thinking about 21st century skills.

She later mentions that until she was working in the STEAM room, she didn’t realize how often other teachers in the school relied on rote learning. Abi mentions a similar issue related to the use of devices during lessons but the lack of devices during tests and exams. I interpret this as Abi devaluing the use of technology. In other words, it’s fine to use the devices to foster 21st century competencies in students during class but not during evaluations. This brings up the idea of assessment in secondary education being strictly test and exam based, mainly in Science and Math as this was Abi’s subject focus. So, if we are trying to teach these competencies to students by implementing BYOD policies, why are we still relying on evaluations that involves memorization of facts and processes to repeat on a test? This is a difficult environment for both Ilana and Abi to be apart of but I will discuss the support systems they have in the next theme.

This “culture” of education in schools, or at least the schools my participants are located, is shifting toward a focus on 21st century competencies, but it’s not quite there yet. So what does this mean for BYOD policies? These policies are encouraging students to develop 21st century competencies, but the effectiveness of the policy is being hindered by the culture of education that is still relying on rote learning. Once again, I can only speak for the two schools that my participants were located, but I believe this could be a common issue among schools implementing a BYOD program, and we need to rethink assessment to match what the expectations are for students.

4.2.2 Teacher mindset. I have discussed how teachers go about implementing a BYOD
We learned from Ross (2013) that teachers’ perceptions of a BYOD policy and their commitment are a major contributor to how much the policy will benefit students. We briefly discussed this above where teachers not seeing the benefits of such a program did not implement anything specific in their classrooms, and were not willing to collaborate with my participants. Although I did not speak to any of these teachers in person, my participants spoke of what they thought were preventing the teachers from committing to the BYOD policy in their school.

My participants listed many factors including: “they’re just closed minded people”, “they think technology should make their teaching easier not harder”, “they are afraid of trying something new”, “they don’t want to be embarrassed”, and “fear of misuse” to name a few. I will address these in general, with one in particular that stood out to me. The fact that this policy, which I believe is to enhance students’ creativity, critical thinking, and problem solving skills, is thought of as a tool to make teachers jobs easier surprises me. A large part of this policy implementation, I’m assuming based on how my interviewees speak about the Peel DSB, is to encourage student centered learning. I think some teachers are so far from the focus of this program that they will never see the benefit if they aren’t brought to a proper understanding.

To combat this misunderstanding, Ilana made brochures for teachers in the department.
She made brochures advertising the STEAM room to teachers and had information about the BYOD program and how she implements it in her space. She distributed this at the beginning of the year and encouraged teachers to contact her with any questions they had about the space or how to work with her to better serve their students. According to Ilana, only one teacher in a school of approximately 70 responded to the brochure. Ilana did not express any reason why this was the case other than the potential reasons listed above, so I believe this leads to a deeper issue. With an optimistic approach, I am going to assume a shift away from this rote learning culture is already happening, so there have to be other issues with the program teachers are scared of. With this in mind, I will now discuss a frequent issue my participant encountered when encouraging BYOD in their class.

4.2.3 Inappropriate use of student devices. We have discussed Ilana’s biggest hurdle working with the BYOD policy mentioned above: collaboration with other teachers. I will now shift to Abi’s experience who claimed the biggest issues when incorporating student devices into her lessons were off task behaviour and the multifunctionality of the devices being a distraction to students.

The first issue comes with students off task behaviour. This is essentially the students using their device for anything but what they’re supposed to, or using their device at an inappropriate time. This was mentioned both as a reason for other teachers in my participants’ schools not wanting to participate in the BYOD program, as well as a real issue encountered by Abi. The second issue Abi mentioned was the multifunctionality of the device. This comes as both an advantage and a hurdle for students and teachers and I believe it is a major cause of the first issue. Abi explained that, “the multitasking capability of the device is what tempts them, and
they’re not going to forget it”. I believe this is true for anyone using a personal device and there is no reason to expect students to have any more self-control than adults. Abi is the leader at her school for implementing BYOD and even states that she spends the first few months of her Grade 9 courses “tech. free”, meaning no student devices. She uses this time to build classroom rules and respect before giving students opportunities to use their device. My understanding of her approach is that, the classroom will be technology free until the students are comfortable working and then the devices are used as a reward for students. This is very different from how Ilana treats her class that we discussed above. Instead of going technology free the first few months, she directly approaches the issue with students and builds respectful technology use and online interactions right from the beginning.

Although this is two very small examples, I point out that Ilana reported no classroom issues with incorporating technology into her classes, but it seemed to be the most problematic issue for Abi. There are many factors to consider here such as school climate, age of students, teaching strategy, etc. but I will make one claim. Abi reported her Grade 9 students had the greatest issues with appropriate use of devices in the classroom with decreasing difficulty as the students got older, and Ilana reported no issues in her Grade 5 class. Ilana also began her classes with the digital citizenship lessons and classroom rules around BYOD, where Abi did the opposite, avoiding student devices all together at the beginning. To me, this calls for two things: first, students need this type of rule setting and digital citizenship so they understand the consequences of their actions from the beginning and secondly, it needs to begin at an earlier age. It appears students in early high school have the most trouble using their own devices in class and I believe a way of combatting this is to start teaching them these skills at an earlier age,
in elementary for example like Ilana is doing. This way, students would be more prepared to use their devices in appropriate ways in the classroom when entering high school.

A BYOD policy certainly has benefits for students but as we now know, also has some issues both for teachers and for students. I have outlined only a few issues mentioned by my participants. Although my participants did not suggest direct strategies for dealing with these issues, I suggested how my understanding of their experiences could lead to better implementation of BYOD programs in the future. The issues explored were part of the answer to my first research questions on how the BYOD program is affecting students. Now that we have a better understanding of this, I will finish the analysis by discussing what teachers are doing on a daily basis.

4.3 Teacher Practices

One of the most important things I talked to teachers about was what they do on a daily basis in their classrooms. This relates to my first sub question of how teachers are effectively integrating devices into their lessons. I will start by discussing some specific technologies teachers are using, their professional development philosophies and experiences, as well as their collaboration with colleagues. Support for teachers greatly impacted my participants' experiences working with BYOD policies in their schools so I will discuss where this support comes from.

4.3.1 Specific technologies to enhance BYOD. A program like this requires specific resources for teachers to use in the classroom. My participants stated that teachers in their schools were often uncertain how to effectively implement such a program in their class. They also reported other educators at their school not knowing what technologies to use, or how to
incorporate student devices into their lessons. We also learned about subject specific benefits of student centered technology use such as enriched content through the use of simulations, models, and 3D visualization tools (Drayton, Falk, Stroud, Hobbs, & Hammerman, 2010). My participants reported many individual technologies they used to enhance students’ experiences that fall into these categories. I will discuss these technologies and their impact on student success.

The first technology mentioned by Abi is a graphing software called Desmos which Abi used in her Math classes. A large portion of the high school Math curriculum in Ontario is based on functions and graphing so Desmos has many applications throughout these courses. Desmos is a phone App which is also accessible online. Teachers can set up specific tasks related to course content for student to experiment with right in the App. It is a very powerful tool for students to explore their understanding of graphing as well as solve problems in the real world experimentally and statistically. This technology would fall under the simulations that Drayton and colleagues (2010) discussed.

The next example, I think, truly transform the learning process. Ilana speaks about the power of coding in teaching and how it encourages students to make mistakes. With coding, very infrequently something will work on the first try, but Ilana discusses the idea of the growth mindset and how coding encourages this in students. Her explanation of the growth mindset is the following: “So growth mindset is the idea that… when you meet a challenge you might say ok this is challenging but I’m still going to try my hardest to overcome it”, instead of simply giving up. She is so passionate about this, she even teaches students about the power of making mistakes and how it affects the brain in a positive way. Ilana claims that coding enhances
problem solving skills by encouraging students to try and fail. With coding, Ilana talks about the task being accessible enough for students to keep going, and the end goal being satisfying enough to encourage students to keep working. With the many possibilities presented with coding, Ilana says it is a perfect way to differentiate to students’ interest and ability to keep them on task, and to encourage them to push through difficulty. With coding in the classroom on student devices as well as through educational coding based games, Ilana reports, in her class, it enhances students creativity, collaboration, and communication skills in the classroom, all of which are 21st century competencies mentioned above (Ontario Ministry of Education, 2016). They are excited about what they are creating and they want to share with other students what they have done and how they have done it. Ilana incorporates coding through multiple technologies including Spheros, Makey Makey, Codeable, and Lightbot to name a few.

There are innumerable technologies out there for educational use with only a few mentioned above. From my understanding, these specific technologies teachers are incorporating to are a major component to the success of a BYOD program. As a new teacher or someone foreign to these technologies, where do you go to access and learn about these new technologies? My participants mentioned multiple sources for finding the technologies they incorporated mainly discussing their reliance on collaboration with other teachers. I will now move on to discuss my participants’ professional development and teacher collaboration experiences and philosophies that helped them successfully incorporate a BYOD program.

4.3.2 Professional development and teacher collaboration. Professional development is something that came up frequently in the literature (Bebell & O’Dwyer, 2010; Bebell & Kay 2010; Ross, 2013; Thomas, 2013). This is something that would certainly benefit teachers with
this policy. However, this was not an issue that teachers often spoke of. I will discuss their philosophies surrounding professional development and how they go about collaborating with their colleagues both in school and in the greater educational community.

The importance of teachers on successful BYOD implementation was discussed by Bebell and Kay (2010), who suggested professional development was a big factor in teachers not successfully implementing BYOD in their classroom. Interestingly enough, my participants did not reflect this importance of professional development in their teaching practice. They both reported attending a small amount of professional development in their professional practice related to BYOD and student centered technology use, but did not communicate its importance like suggested from the literature.

Abi and Ilana reported similar experiences working with professional development. They both attended workshops specifically related to 21st century competencies and BYOD through Peel DSB but reported little impact on their teaching. Abi reported collaborating with teachers in her department and sharing resources was the most effective. She said she simply had an “internal drive” for new pedagogy and ways of teaching in combination with her natural interest in technology and that was what pushed her toward BYOD. While this is not helpful for teachers without these internal drives, Abi also reported that sharing her resources with other teachers in the school helped her strengthen her own knowledge on the topic as well as helped give teachers new to BYOD confidence to try new things. Ilana reported similar things but without the collaboration with colleagues. She finds her resources through online professional communication with teachers implementing similar programs. She reported doing this through social media mainly using Twitter and Pinterest to gather new ideas as well as share her
experience with the technology she uses in her class.  

Once again, this is a very small scope, but I believe this points toward a shift in professional development in education. With online communication tools like Twitter and Pinterest, I believe traditional PD is getting phased out with informal sharing of personal stories and experiences. Unlike the literature alluded to, my participants both suggest that collaborating with teaching professionals, in person or online, was more important to their growth than formal professional development from their school board. If this is the case, I believe the success of a BYOD program depends more on this level of informal collaboration and less on formal professional development like research suggested.

**4.3.3 Supporting communities.** One of the biggest factors my participants reported that affected their success with BYOD was the support they felt from various communities. This can vary greatly from school to school but I will discuss how administration can support teachers and where the support for teachers implementing BYOD is lacking.

Community support was not something that came up in my literature review however, one participant mentioned its significance on multiple occasions in reference to her experience working with BYOD at her school. Ilana mentioned collaborating online with someone that runs a similar STEAM room in a different school. This teacher had to change schools because the administration was not supporting her at all. Luckily, this was not the case for Ilana. She said she feels “100 percent supported by the administration”, and she continued to say,

“they [administration] have been in my corner saying we know what you’re doing is awesome and we know what you’re doing is important so please keep doing it and
hopefully people will catch up with you... they’ve been very supportive, there’s no way I could have done this without their support.”

Unfortunately, Ilana goes on to say that she is worried about her upcoming year. The administration is changing at her school and she is worried about the continuation of her current position. I believe these two stories highlight the importance of support from administration in the success of a BYOD program. Peel DSB has a board wide policy encouraging students to bring their devices but it is solely up to the teachers, and evidently administrators, to make such a policy effective and beneficial to the learning of students.

With the many responsibilities and experiences of teachers on a daily basis I have presented only a few things that teachers encounter on a daily basis. Even though this is a brief investigation of teachers' daily experiences working with BYOD in their classroom, I believe it gives a well-rounded view of their experience working with students, colleagues, and administrators at their schools.

4.4 Conclusion

The goal of this research was to explore, through the perspective of teachers, how students are being affected by a BYOD program, to gain a better understanding of how a BYOD program is implemented by teachers, and what those teachers experience on a daily basis. Participants shared their experiences working with a BYOD program and I organized my data into three themes discussed above: benefits for students, issues surrounding a BYOD program, and teacher practices.

I began by discussing the Ontario Ministry of Education’s understanding of 21st century
competencies and how teachers are able to foster these competencies in students through the use of a BYOD program. This is done through the use of many technologies and a broader understanding of what is important for students to be learning in the 21st century. Digital citizenship was then discussed in depth and the impact it has on students. I argued that digital citizenship should be a part of students’ education and BYOD programs offer a perfect place to include this type of education for students of various age groups.

Teachers discussed many drawbacks and difficulties working with the BYOD program such as an “ingrained rote learning culture”, teacher mindset, and inappropriate use of technology in the classroom. This culture of rote learning combined with what teachers believe about this program reinforce the ideas of Ross (2013) about the importance of teacher commitment and belief in such a program being key to its success. I came to the conclusion that digital citizenship may be the key to effectively implementing a BYOD program, and that this education should be starting in the younger grades so students have a healthy and respectful mindset toward the use of technology in their lives.

Finally, I explored what tools teachers are using in the classroom, their thoughts and experiences with professional development, and the importance of administration supporting this type of program. Multiple technologies were discussed with a focus on coding and how it encourages problem solving skills and a “growth mindset” in students. My participants discussed the importance of teacher collaboration and sharing resources rather than formal professional development. This was very different than what the research suggested of a high focus on the importance of professional development for teachers.
Now that I have outlined my findings, my understanding, and their connections to the research, I will shift to future directions. I will explore the implications this work has on the educational community as a whole as well as the implications on my own career as a teacher researcher. I will explore questions that arise from this work, as well as future directions for this research.

Chapter 5: Conclusion

5.0 Introduction

This qualitative research study aimed at understanding more about the BYOD policy in Peel DSB. More specifically, my study sought to gain a better understanding of how teachers work with it and their observations of its effects on students. I sought to understand how this BYOD policy is implemented in an Ontario school board and how it functions on a daily basis. In the exploration of this topic I sought answers to the following questions:

1. How is a bring your own device program implemented in a school and what are teachers doing on a day to day basis?

2. How do teachers perceive this policy benefiting students’ education?

3. What possible issues teachers may face when implementing a BYOD program?

In this chapter, I will overview the key findings from Chapter four and their significance. The implications from these key findings are discussed with respect to the educational community as well as my personal identity and practice as an educator. Expanding on the implications, I will recommend next steps for those directly impacted by the key findings including practicing teachers, school administration staff, and Ontario school boards outside of Peel DSB. This chapter concludes with a discussion of the potential future direction of this work.
5.1 Overview of Key Findings and Their Significance

This research study helped provide answers to my research questions above and revealed several important findings. The first of which is that teachers do perceive students benefiting from this type of program in different ways, most of which can be described as twenty first century competencies as well as fostering a growth mindset in students. This is significant for two reasons, first because students are gaining important life skills through this type of program. With the above evidence of this program benefiting students, this provides reason to potentially implement this type of program in other Ontario school boards. More directly linked to Ontario schools, the Ontario Ministry of Education released a policy document in 2016 called *21st Century Competencies* outlining similar competencies mentioned by my participants and their importance for students in Ontario schools. The bring your own device policy is an effective avenue to incorporate these competencies in your teaching.

The second key finding is that a BYOD program, in the experience of my interviewees, provides an opportunity to have a conversation about digital citizenship as well as its necessity in the classroom. My participants found that digital citizenship could be the cornerstone in making a BYOD, functional and successful for both students and teachers. This is significant because it provides a concrete foundation and/or starting point for teachers who plan on implementing this type of program in the future.

The third key finding is related to support teachers receive to help implement BYOD in their classroom. This support is related directly to the administration supporting this kind of program in their school, as well as their experience with professional development specifically addressing BYOD in the classroom. Teachers found that this type of professional development
was not overly beneficial to their successful incorporation of BYOD in their classroom’s. This is significant because teachers found local sharing of materials, programs, technologies, and classroom practices more beneficial than attending professional development.

5.2 Implications

In this section I elaborate on the key findings and discuss their implications for two general contexts. The first is the educational community with respect to three specific groups: teachers in Ontario, administration staff at schools employing BYOD, and school boards in Ontario outside of Peel DSB. I will also discuss the implications on my personal and professional identity as an educator.

5.2.1 The educational community. This research study has impacts on the educational community in three distinct areas, the first of which is classroom teachers. As mentioned above, the teachers I interviewed believed their students were benefiting from the bring your own device program they were employing in their classroom. Although the programs were slightly different and they had different supports from their administration and departments, both teachers believed it was benefiting students. This has multiple implications for teachers. First that teachers in Peel DSB should be working actively to engage with BYOD in their classroom. They have support from the board who is employing the policy and, hopefully, from other teachers in the school. Secondly, I believe that we as educators have the responsibility to be teaching our students about digital citizenship and online respect and responsibility. As mentioned above, this could also be key to successfully implementing a BYOD program in your classroom. Above and beyond digital citizenship, student devices are ever present in the classroom and I believe it is our responsibility to show students who have access to devices how they can use it to positively
impact their learning.

Next I will discuss the implications for administration staff in schools that are pushing for this type of program. Both of my teachers mentioned the importance of support from administration in their implementation of a BYOD program. This support comes mostly in the form of validation, encouragement, and genuine belief in this type of program. My interviewees described other teachers in their department being skeptical of the benefits of such a program. I believe that administrators are in a position to influence how teachers feel about this type of program, and encourage teachers previously unwilling to take a risk to both allow and encourage students to use their devices in a productive manner in their classroom.

The third group affected by this research are school boards in Ontario outside of Peel DSB. Although this research is based on teachers in Peel DSB, I believe this program can have similar benefits for all Ontario schools. However schools with lower socioeconomic status may be an exception to this. If it is implemented successfully, it may directly benefit students in any school board. This implies that similar programs could exist and thrive in Ontario school boards and schools outside of Peel DSB. The Ontario Ministry of Education document on twenty first century competencies (Ontario Ministry of Education, 2016) is evidence that students need to develop these skills, and implementing a similar program in other Ontario schools is a perfect way to achieve this.

5.2.2 My professional identity and practice. In my future educational career two things from this research will inform my teaching practice. First, I will take away the knowledge I have gained simply from talking to teachers about making use of students’ devices in their classrooms. I have learned about multiple programs and technologies to support the learning of students
across many grade levels. I plan on entering the educational world as a secondary school teacher and taking this knowledge with me to support my students, teach them about digital citizenship, and show them how powerful their devices can be in supporting their education.

Secondly, I plan on taking what I have learned about digital citizenship and use it to my advantage in my future classrooms. From my experience working as a teacher candidate in the Toronto DSB, I have seen first-hand how students’ use of their devices can present problems for teachers. In my future teaching, I plan on using student devices to my advantage, not only to teach students about digital citizenship and respectful device use, but also to make my classroom conducive to twenty first century competencies.

Lastly, and rather ambitiously, I plan on not only making BYOD a part of my own classroom teaching, but I aspire to change teachers outlooks on this topic. Both of my interviewees mentioned the importance of sharing resources and ideas with other teachers in their department, in fact it had a bigger impact on their learning than formal professional development did. I aspire to be that person who inspires other teachers in my school to reach outside their comfort zone and try incorporating student devices in their classroom practice. I believe, whether we like it or not, personal devices have a massive impact on our lives and they are not going away anytime soon. We are under serving our students if we do not provide them with skills and responsibilities in relation to these devices that have such a large impact on their lives.

5.3 Recommendations

This research study has implications for three specific stakeholders in the educational community. I will discuss specific recommendations I believe the above stakeholders can and should take as a result of this research study. First, I believe teachers in Peel DSB who are not
implementing BYOD in their classroom should consider doing so, however I realize this is not so simple. To facilitate this, I believe teachers in Peel DSB currently implementing this need to reach out to their department members to share their success as well as how they have overcome certain difficulties. I believe part of this challenge is changing the mindset of teachers who, rightfully so, have negative opinions on student devices in the classroom. I suggest that teachers of younger grades, who may potentially believe this type of program is strictly for older students, also embrace student devices in their classrooms, and especially take time to teach their students about digital citizenship.

The administration staff in Peel DSB, or other schools actively implementing a BYOD program, can do multiple things in light of these findings. First, I recommend that they deal with the issue of professional development that is outlined in chapter four. I believe there are two options to support teachers: they can work with curriculum leaders in their school to set up sharing opportunities within departments. This could be done both in person or more informally online using technology available to the department. Since teachers in this study voiced their disinterest with professional development, administration at schools in the Peel DSB can reach out to the school board and be the communication link for teachers. Together with the help of teachers and administration staff, Peel DSB could offer professional development for teachers that is more in line with what they need.

Finally, I suggest that other school boards in Ontario embrace a similar BYOD program. It has clear benefits to student learning and development outlined in chapter four, and the Ontario Ministry of Education is looking to improve the skills of students that are being benefited by this type of program; namely twenty first century competencies mentioned in their policy document.
(Ontario Ministry of Education, 2016). They can do this by reaching out to Peel DSB, talking to both teachers and administration and getting an understanding of how this policy came to be, what issues were involved in its initial development, and how to overcome them.

5.4 Areas of Further Research

This research study has supplied answers to the questions I posed on incorporating student devices in the classroom, but opened many doors for further research in the area. First and foremost, I believe students’ own voices should be taken into consideration when discussing such a policy. This qualitative study mainly focused on the ideas and perceptions of teachers. This was helpful in discussing the benefits on students, but students’ own voices were not taken into consideration. Since students are the ones being affected by this policy, I believe it is important we hear directly from them to understand how they perceive themselves being affected by this type of program. This could be done through surveying Ontario school students on their device use in the classroom and whether or not it has positive or negative effects on their classroom engagement and/or participation.

Although this study was successful in answering my questions about the daily functionality of a BYOD program, getting a more comprehensive understanding of teachers opinions in Peel DSB on the policy and its implementation could be very beneficial. This could be used in comparison to this study to investigate whether or not these results are uniform across Peel DSB or if teachers are encountering other difficulties or perceive their students benefiting in different ways than reported in this study.

Based on the interviews conducted in this study, although not directly explored, I believe a BYOD policy could potentially help English language learning (ELL) students as well as
supporting students with special education needs. I believe this type of program could have a positive impact on these students, as well as support the integration of these students into mainstream classes. This could be explored by speaking with specific special education teachers as well as English as an additional language teachers to discuss the needs of those students and how a program like this could fit those needs and better serve those students.

5.5 Concluding Comments

This chapter has provided an overview of my study as a whole. I began by reintroducing my research questions and exploring the key findings of my research. I took these key findings and discussed how they would impact three stakeholders in the educational community: teachers in Ontario, administration staff at schools employing BYOD, and school boards in Ontario outside of Peel DSB. I also explored the impact they have on my own professional practice as an educator. Based on these implications, I discussed why they were important and made specific recommendations for those stakeholders to take action in response to this research study.

Classroom teachers in the twenty first century often struggle with students on the use of their devices in the classroom. As far as I am concerned, the student and the cell phone are not going to be separated anytime soon. With this in mind I ask: why not embrace this technology as an integral part of your classroom and use it to your advantage? As far as I am concerned, you have nothing to lose, and this research study certainly goes to show there is ample gain for your students.
References


Ross, K. (2013). Teacher implementation of “bring your own device” at a suburban high school serving high SES students. (Unpublished doctoral dissertation) Arizona State University, Arizona, US.


Appendix A: Letter of Consent

My Name is Brodie Macleod and I am a student in the Master of Teaching program at the Ontario Institute for Studies in Education at the University of Toronto (OISE/UT). A component of this degree program involves conducting a small-scale qualitative research study. My research will focus on the bring your own device policy in Ontario schools and teachers perceptions of this policy. I am interested in interviewing teachers who have experience working in a school that enforces bring your own device and is comfortable speaking about its effects on both teachers and students. I think that your knowledge and experience will provide insights into this topic.

Your participation in this research will involve one 45-60 minute interview, which will be transcribed and audio-recorded. I would be grateful if you would allow me to interview you at a place and time convenient for 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. I may also present my research findings via conference presentations and/or through publication. You will be assigned a pseudonym to maintain your anonymity and I will not use your name or any other content that might identify you in my written work, oral presentations, or publications. This information will remain confidential. Any information that identifies your school or students will also be excluded. The interview data will be stored on my password-protected computer and the only person who will have access to the research data will be my course instructor Cristina Guerrero. You are free to change your mind about your participation at any time, and to withdraw even after you have consented to participate. You may also choose to decline to answer any specific question during the interview. I will destroy the audio recording after the paper has been presented and/or published, which may take up to a
maximum of five years after the data has been collected. There are no known risks to participation, and I will share a copy of the transcript with you shortly after the interview to ensure accuracy.

Please sign this consent form, if you agree to be interviewed. The second copy is for your records. I am very grateful for your participation.

Sincerely,

Brodie Macleod

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 from this research study at any time without penalty.

I have read the letter provided to me by Brodie Macleod and agree to participate in an interview for the purposes described. I agree to have the interview audio-recorded.

Signature: __________________________________________________

Name: (printed) ______________________________________________

Date: ______________________________________________________
Appendix B: Interview Protocol

Thank you for agreeing to participate in this research study, and for making time to be interviewed today. This research study aims to learn about the effects of the bring your own device policy on students and teachers for the purpose of helping new teachers who are coming into this environment. This interview will last approximately 45-60 minutes, and I will ask you a series of questions focused on your personal experiences with technology integration in the classroom and working in classrooms with the bring your own device policy. I want to remind you that you may refrain from answering any question, and you have the right to withdraw your participation from the study at any time. As I explained in the consent letter, this interview will be audio-recorded. Do you have any questions before we begin?

Background Information

1. How long have you been working as a full time teacher in Ontario?
2. What is your main subject area focus?
3. How long have you been working in a school that enforces a bring your own device policy?
4. Briefly describe any professional development specifically related to student centered technology integration in the classroom you have attended.

Teacher Perspectives

5. In your experience, in what ways are students benefiting from the bring your own device policy? Provide specific examples if possible.
6. What are some of the greatest drawbacks affecting students in regard to the bring your own device policy?
a. What are some of the strategies you use to deal with these drawbacks?

7. How might the multitasking capabilities available on phones and tablets impact students when using the devices?

8. What impacts might devices have on classroom climate?

9. In your experience, what is the greatest strength and the greatest weakness of incorporating the bring your own device policy into your classroom?

Teacher Practices

10. What type and to what degree of support do you receive from:

   a. Your colleagues? Both in your department and outside.
   b. Administration?
   c. Peel Board

11. Describe your level of technology integration in the classroom with specific examples if possible.

   a. How does this compare to teachers in your department?

12. What is the biggest challenge for you as a teacher when integrating student devices into your lessons?

13. Do you think you would benefit from more professional development related to integrating student devices into the classroom? Why?

14. What are you most uncomfortable with when it comes to students using devices in the classroom? Why?

15. Do you have any specific strategies you can share for teachers working with a byod policy?
Professional Development

16. How do you and other teachers in your department share ideas and experiences related to technology integration?

17. How and where do you seek out resources to help with integrating student devices into your lessons?

Next Steps

18. What advice or wisdom would you give to new teachers that have very little experience in this type of learning environment?