Non-Digital Native? No Problem: The Significance of Technology Integration To Non-digital Native Teachers Committed To Implementation

By: Jovi Monteiro

A research paper submitted in conformity with the requirements For the degree of Master of Teaching
Department of Curriculum, Teaching and Learning
Ontario Institute for Studies in Education of the University of Toronto

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Abstract

Technology is ever present and currently playing a vital role in children’s lives today, as “they live in a world enveloped by technologies and use technologies in their daily life” (Hague & Payton, 2012). Students are further susceptible to the assets of technology use and attain a wide range of technology within modern day classrooms, therefore allowing content such as the curriculum to be taught more efficiently as today’s technology is most relevant to students of this generation. However, it is known that in order for these tools to be used to their fullest capacity, one must primarily attain suitable confidence and competence. This study explores how non-digital native educators have developed expertise in utilizing technology as a tool in their classroom and in correspondence with curriculum. The results from the data collected indicate that: 1) teachers depend on support from the board of education as well as administration in order to support their own personal growth as educators as well as proficient users of modern technology, teacher collaboration, as well as self-motivation, 2) teachers underlined technology integration as a tool that is mainly infused in classroom learning in order to enhance and engage student learning, 3) teachers typically implement technology when delivering the math, literacy and physical education as these subjects allow technology to enhance and assist with the delivery of curriculum, and monitoring student progress and achievements, 4) teachers continue to perceive technology integration to be beneficial yet disadvantageous to both their teaching as well as student leaning.

Key Words: Technology, Non-digital Native, Integration, Teachers, Confidence
Acknowledgements

I would like to acknowledge and thank my research supervisors and professors for their commitment, continual support, and guidance throughout the entire research process. Additionally, I wish to thank Dr. Shawn Lennie, a former research professor of mine who guided me to the realm of research in education and pushed me to my full potential, further assisting me with recognizing my capabilities as a teacher-researcher. I also want to thank the members of cohort P/J 271 for their encouragement and companionship throughout our two years together – because of each and everyone of you, I have truly come to understand the significance of working alongside a strong, positive, and supportive community. Thank you to all of my friends and family, especially my parents, for their ongoing support and advice throughout my post-secondary education journey, and for always instilling me with the will to move forward and succeed.
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Chapter One: Introduction

1.0 Introduction

Technology is ever present and currently playing a vital role in children’s lives today, as “they live in a world enveloped by technologies and use technologies in their daily life” (Hague & Payton, 2012). Students are further susceptible to the assets of technology use and attain a wide range of technology within modern day classrooms, some of which vary from computers, tablets, SMART Boards, etc. Diverse forms of technology have the potential to allow content such as the curriculum to be taught more efficiently and are more relevant to students of this generation and generations to come. Current research states: “Contemporary young children are part of the generation of digital natives” (Hsin, 2014, p.1). Therefore, providing this generation of digital native students with technology-mediated learning environments further provides opportunities for these students to solve problems, communicate and collaborate, explore and examine information (Lim, Zhao, Tondeur, Chai, & Tsai, 2013, pg. 59).

This research surrounds the idea that with the rapid development of technologies, it is evident that modern technology has changed children’s lives and the way in which students learn. Thus, educators are encouraged to attend to the current needs of their students in respect to technology being implemented in classrooms in respect to delivering the curriculum. Moreover, It is vital that teachers/educators rethink “the roles of technology in young children’s development and consequently the development of learning theories and curricula that meet the needs of contemporary children” (Hsin, 2014, p.2).

This study is particularly imperative to current emerging literature, as it will
address the factors that influence how and why teachers integrate technology into their classrooms. The study will further explore how they have come to do this work effectively in respect to integrating technology across the curriculum in ways that deepen and enhance the student learning process. Therefore, providing transparency in respect to what teachers seek and how they attain confidence and success when integrating meaningful technological experiences in their respective classrooms and or school communities.

1.1 Research Study Purpose

The purpose of this study is to address how non-digital native educators have developed expertise in utilizing technology as a tool in their classroom. The main research question posed for this research project is: what does technology integration mean in theory and practice to a sample of non-digital native elementary school educators who have a demonstrated commitment to this work? This study is devoted to exploring elementary school teachers’ experiences with the use of current technology. Specifically, further exploring the perspectives and experiences of non-digital native educators who have demonstrated commitment to integrating current technology within their classrooms.

This is an essential topic to study as technology is ever present and currently playing a vital role in children’s lives today, as they are currently living in a world enveloped by technologies and use technologies on a daily basis (Hague & Payton, 2012). The need for technologically literate teachers is becoming more imperative as technology continues to advance and develop. In today’s day and age children/students as young as 5 years old have access to the latest technology and programing on their
personal iPads/tablets. However, in many classrooms, the technology is well past obsolete, as desktops, laptops, VHS and DVD players are far outdated and don’t always contribute to current as well as advanced learning.

In some cases, particular schools have come to recognize that they technology at their respective school is outdated, but what they truly fail to recognize is by purchasing the latest technology with insufficient training and understanding, results in a discarded technological asset. It has been recognized that there is insufficient training in respect to the implementation of technology use in classrooms causing teachers to rely on other sources such as social networking sites in order to interact with and learn from their peers and staff community (Luehmann & Tinelli, 2008). By considering the beliefs and approaches of non-digital native educators who are currently technologically inclined, current along with future school communities may become better equipped in respect to the successful implementation of technology. Therefore, it is vital that teachers/educators recognize “the roles of technology in young children’s development and consequently the development of learning theories and curricula that meet the needs of contemporary children” (Hsin, 2014, p.1). Understanding how to successfully integrate technology within the classroom is of great significance for future teachers in order for them to be able to implement technology successfully with the curriculum.
1.2 Research Questions

This study will further address a set of sub-questions to further guide this inquiry, the sub-questions include:

- How do non-digital native teachers develop confidence in competence in learning how to integrate technology in their classroom?
- What technologies do teachers integrate and why?
- In what curricular subject areas do these teachers typically integrate technology and why?
- How do these teachers’ students respond to technology integration?

This project also aims to raise awareness of the importance of successful technology integration in the classroom, and to inspire current and future teachers to be mindful of themselves in respect to theory and practice in the field of education and teaching the future of tomorrow.

1.3 Researcher’s background

Being born and raised apart of Generation Y (1990’s), I have had the privilege of growing up in a rising digital age. As a result of this, I am fortunate enough to understand technology without an abundance of hesitation and or frustration. Growing up in a digital age meant living in a time when the use of technology amongst children was of great implication. Growing up at a time where the introduction of the personal computer with rising technology introduced me to the ability of transferring information freely and quickly as well as being a source of entertainment. As I can recall, my first interaction
with technology was comprised of my three-year-old self, sitting in front to my parents’ large computer. I had access to this computer as the computer was used as a tool to assist my mother as a result of her consistent demanding workload. Some of my earliest memories of my mother consist of her working on her computer, transferring data from her office in the city to our home with the assist of her multiple floppy disks. However, I used the computer for entertainment purposes as I have vivid memories of interacting with the computer as I enjoy some free time playing “Putt-Putt”, a collection of children's adventure and puzzle computer games created by Humongous Entertainment. This particular computer game involved the clicking of a mouse to get to a destination, although some sub-quests and mini-games involve a keyboard. This game was a computer game that was stored on a disk through the use of a disk drive.

According to my parents I was instantly captivated and memorized with what I was capable of doing with the simple click and stroke of a mouse, as well as the clacking of the keys on the keyboard. I have always been interested in computer technology and have become more so as technology has continued to play a significant role in my own life today. Technology has impacted me in a positive way though the integration of it in my own personal life. For one, it has impacted me in a positive manner, allowing me to facilitate a great deal, significantly in my own learning and classroom experience as a teacher candidate. In my classroom experience as a teacher candidate, I have been able to explore and incorporated technology. I have experienced technology being used and implemented in the classroom through a range of activities. For example, the simplest of activities and technology being speakers for playing recordings (audio books, music) and over head projectors to display notes/information on the board, to complex systems of
tablets/iPads, computers, interactive SMART Boards and other devices which allow students to engage in and collaborate with material.

I believe that it has been through my early experiences with technology that has allowed me to build a comfortable foundation for my affiliation with the implementation of technology. Therefore, allowing me to feel comfortable and not hesitant with the facilitation of technology in association to curriculum content. Although I feel I posses a certain comfort level with technology in the classroom, the reality is that this isn’t the case for all teachers today. As a teacher candidate, working towards being apart of the teaching field, I am concerned that children will not be provided with consistency in respect to education and the implementation of technology. It is of great significance to me that as a profession we remain consistent and provide students with the same opportunities, fluctuating from classroom/teacher to classroom/teacher.

1.4 Overview

This research project is organized into Five Chapters. In Chapter Two, I review literature in respect to the areas in which teachers implement technology in elementary school classrooms, as an informative tool. I uncover what literature has to say in respect to technology integration in the classroom, students and teacher’s responses to technology integration, as well as the benefits and factors influencing successful integration of technology in the classroom. In Chapter Three I describe the research methodology and include information about the participants, the data collection, and limitations of this study. Through Chapter Four I report and discuss the research the studies findings. Finally, in Chapter Five I review and discuss the implications of the findings and make recommendations for future directions.
Chapter Two: Literature Review

2.0 Introduction

This chapter entails a review of literature in respect to technology integration in Ontario elementary schools (primary and junior level), specifically themes fostering the meaning of technology integration through theory and practice. More over, this chapter will review the number of ways technology is integrated in classrooms, along with the reasoning behind their uses in respect to student, teacher and parental uses. Next, this chapter will review how students respond technology integration and some of the benefits and challenges that this may encompass in respect to both teachers and students. Finally, this review further examines and fosters the various existing criteria for successful and efficient integration of technology in current classrooms.

Technology is ever present and currently playing a vital role in children’s lives today, as “they live in a world enveloped by technologies and use technologies in their daily life” (Hsin, 2014, Pg. 1). Students are further susceptible and attain a wide range of technology within modern day classrooms, some of which vary from computers, tablets, SMART Boards, etc. These forms of technology have the potential to allow content such as the curriculum to be taught more efficiently and are more relevant to students of this generation and generations to come. Effective integration of technology in today’s classrooms is the result of a variety of factors. A vital component of effective technology integration is the teachers' proficiency and ability to adapt technology to meet the needs of his/her students. This is evident as “Teachers know their content and pedagogy, but when it comes to technology, teachers often learn along with students” (Gorder, 2008, p.63).
2.1 Integration: Technology In The Classroom

It is evident that technology integration and investment in schools has increased over last few decades. Much of this investment has been made based on the belief that “technology-mediated learning environments provide opportunities for students to search for and analyze information, solve problems, communicate and collaborate, hence equipping them with a set of competencies to be competitive in the 21st century marketplace” (Lim, Zhao, Tondeur, Chai, & Tsai, 2013, pg. 59). In present day, the act of integrating meaningful technology tools into curriculum is becoming a vital component of good teaching. Sheingold’s research (1990) states, “integrating technology in the classroom is not about teaching students to operate computers, but integrating technology is about helping teachers to use technology as a tool for learning” (Gorder, 2008, p.63). Fulton (1997) indicated that teachers model technology fluency by using technology in the classroom. They do this by applying technology transversely throughout the curriculum, and integrate technology to facilitate collaboration and cooperation among students (Fulton, 1997).

In respect to the latest technology integration, there have been many “success stories” that prove that when used properly, technology does lead to enhanced teaching and learning outcomes for both students and teachers. This is evident as teachers recognize that their students are “now more engaged and are able to make better connections between their previous learning experiences and the new concepts or principles being taught” (Lim, Zhao, Tondeur, Chai, & Tsai, 2013, pg. 59). As a result of conducting a Technology in Education Study (Law, Pelgrum, & Plomp, 2008) that involved 28 countries in Africa, Asia, Europe, North America and South America,
researchers discovered that “technology has been changing classroom practices and learning processes” (Lim, Zhao, Tondeur, Chai, & Tsai, 2013, pg. 59). Some of which include “a shift in the role of the teacher from being the sole source of information to a more complex role of negotiating lesson objectives with students, providing a varying degree of support for different students, monitoring students’ progress, and encouraging reflection on classroom activities” (Lim, Zhao, Tondeur, Chai, & Tsai, 2013, pg. 59).

2.2 Students & Teacher Responses: Technology Integration

2.2.1 Students

Living in the 21st century, it is not unusual to witness students devoting a significant amount of their daily time to interacting with an array of technologies. As it is stated that, “access has expanded dramatically among families with 0- to 8-year-olds: in 2011, 8% had an iPad or similar tablet device; today do. In fact, almost as many children now have their own tablets as parents did two years ago” (Rideout, 2013, Pg. 20). It has been reported that “children six and under spend an average of about two hours a day with screen media (1:58), about the same amount of time that they spend playing outside (2:01), and three times as much time as they spend reading or being read to (39 minutes)” (Rideout, 2003, p. 4). Also, it has been stated that the amount of involvement in the current digital world is phenomenal and its growth has been dramatic (Lim, Zhao, Tondeur, Chai, & Tsai, 2013). Previous research also states, there were about 800 million Internet users around the world in the year 2004. This number had increased significantly to about 28.7% of the total world population” (Lim, Zhao, Tondeur, Chai, & Tsai, 2013, pg. 60). Therefore, this results with children being more technological adept at a much early age than previous generations.
Technology integration has offered an opportunity for students taken on a more active role in their own learning process. This is apparent when students use technology to search for and collate information, and publish and share their findings. They are “now more engaged and are able to make better connections between their previous learning experiences and the new concepts or principles being taught” (Lim, Zhao, Tondeur, Chai, & Tsai, 2013, pg. 59). It has been founded that “When children become creators of learning, the technologies can be either used as tools or tutees (Hsin, Li, & Tsai, 2014). For example, tablets, PC’s, digital cameras and or recorders, and computer programs are all tools that students can utilize in order to express and communicate their ideas and/or use to engage in social interactions with their peers. It has been identified taht “when children become creators of learning, the technologies can be either used as tools or tutees (Hsin, Li, & Tsai, 2014). Overall, the ever evolving use of technology has led students to irreversible changes in respect to how they processes information, work, live, communicate and play, changes in which all must embrace.

2.2.2 Teachers

Research on teacher acceptance and use of technology has resigned many mixed results. In terms of designing and implementing curriculum, teachers are equipped to combine available materials with their own knowledge and expertise to implement instructional experiences (Brown and Edelson, 2003). Thus it has been noted that, “by understanding how teachers use tools to aid their practice, we can further define their facilitating roles”(Matuk, Linn & Eylon, 2015, pg.232). Most educators are beginning to agree that technology should be integrated as a tool to promote and extend student
 learning. In terms of teacher past and current uses and responses to technology integration in their classrooms, a study was conducted by Judson in 2006. As a result, it has been stated that a wide array of teaching strategies exists and are slowly being implemented in respect to technology in the classroom. Some of the strategies included in this study consisted of projecting lecture notes, entering data, having students complete multimedia presentations, and allowing students to conduct research of personal interest.

Most recently Matuk, Linn & Eylon (2015) found that teachers are also using technology in the classroom to devising timely instructional interventions to provide individualized guidance, planning activities and adjusting milestones to align with students’ progress, modifying existing materials to better integrate content into overall curriculum plans, and incorporating scaffolds to better address students’ needs (Matuk, Linn & Eylon, 2015, pg.238). For example, teacher’s access established networks in order to connect teachers to external online materials, which they would use to create or customize their own materials (Matuk, Linn & Eylon, 2015). An example of this would be Sumner and CCS Team’s (2010) Curriculum Customization Service, as it assists “teachers identify and integrate digital resources into their existing curriculum during the planning stages of their implementation”(Matuk, Linn & Eylon, 2015, pg.233). Lastly, it was mentioned that, databases have also been created and published to archive others’ experiences and materials as teaching resources. Therefore, it is apparent that when applied to the curriculum effectively and with meaning, technology can be a tool for both teachers, as well as for students.
2.3 Benefits of Technology Integration

2.3.1 Students

According to a study by Gorder (2008), students prefer and benefit from the use of technology integration because they believe that it makes learning more stimulating. They enjoy the implementation of laptops and tablets and more. Subjects that some students regard as challenging or unexciting, such as mathematics, history, etc. become more attractive with the use of virtual lessons, through the use of technology. The integration of technology in classrooms provides benefits to students on a variety of levels (communication, research, etc.). Essentially, technology prepares students for their digital future. Sherritt and Basom (1996) stated, schools were ineffective at preparing students for life and work due to the fact that the requirements of successful life and work conditions have changed due to the rapidly changing digital age (Gorder, 2008, p.64), as 21st-century digital skills are essential in order to be successful in this day and age. Therefore, verifying the fact that jobs that may not have had a digital component in the past, may have one now.

Jaffee (1997) outlined valued pedagogical principals practiced in classrooms where technology is integrated, all of which benefit students learning. The principals consist of: active learning, collaboration, and interactivity. Primarily, active learning with the use of technology allows students to further explore and interact with content and or an abundance of content, allowing them to further build on their prior knowledge Gorder, 2008). Secondly, collaboration allows the student to interact at their own pace through problem solving and the sharing of information (Gorder, 2008). This is vital as students retain knowledge at their own pace. For example, with the use of technology, a vast
majority of applications allow for individual instruction such as, applications that track progress (Raz-Kids). Lastly, interactivity allows students to build an understanding through interactions with their peers and teachers (Gorder, 2008). Therefore, allowing teachers and to interact with each other on a more personal level in order to assist with problem solving, responding to questions, and discussing content.

2.3.2 Teachers

With a highly competitive job market that is likely to continue for the years ahead, students require a wide range of technology-based skills in order to be prepared for their future in the work force. By fostering these technological literate skills (typing, navigating the internet, becoming aware of the resources we have access to) though the early years students will be better equipped for the continuous advancements of technology in the following years to come. What does this mean for educators? Technology has the capability to improve how teachers educate the young minds of their students while managing their classrooms. An example of this would be computers, tablets, SMART Boards and the Internet, as they are all tools that can be used to improve the work of a teacher, teachers as a team, and the delivery of lessons plans based on individual student needs. Cubukcuoglu (2013) states, that by believing in the advantages and benefits of using technology in the classroom are vital factors that encourage more frequent use by teachers and staff. Additionally, Cubukcuoglu states, “it is important to be able to integrate technology into a related activity in subject teaching” (Cubukcuoglu, 2013, p. 58). By integrating technology into a related activity teachers are better able to make implementation meaningful to both their students and practice moving forward.
Findings reveal that exemplary teachers who use technology, not only spent a substantial amount of their time working with computers but also working collaboratively with their colleagues who also attained a meaningful use for computers in respect to creating and implementing activities as teachers are relying on social networking sites now more than ever, in order to interact with and learn from their peers and staff community (Luehmann & Tinelli, 2008). Teachers were able to benefit as they shared and enjoyed school-and-district-level support for technology use (Becker; Hadley & Sheingold, 1993), and had sufficient staff development opportunities (Pierson, 2001). When technology is integrated appropriately in the classroom, teachers are able to interact with students at a more enhanced level in order to assist with problem solving, responding to questions and discussing topics related to the course in correspondence with the curriculum (Gorder, 2008). Therefore, a benefit of appropriate technology integration is that it further supports a teachers practice in respect to their own professional development as well as supporting student success.

2.4 Factors Influencing Teachers’ Responses To The Integration Of Technology

Although technology has been found to be beneficial to both students and teachers, current research has identified that there are several factors influencing the integration of technology into classrooms today. Bauer and Kenton's (2005) research found that some teachers were “highly educated and skilled with using technology, but teachers were not integrating technology on a consistent basis in the teaching and learning process” (Gorder, 2008, p.63). Stockdill and Moreshouse (1992) identified user characteristics, content characteristics, technological considerations, and organizational capacity as
contributing factors influencing technology integration. Balanskat, Blamire & Kefalla (2006) identified the factors as being highly influential on a teacher, school and system basis, in respect to the decision to integrate. Teachers’ integration of technology into their teaching practice, has also been found to be influenced by organizational factors along with the attitudes teachers withhold towards technology (Buabeng-Andoh, 2012, p.137).

According to Sherry & Gibson (2002) “technological, individual, organizational, and institutional factors should be considered when examining ICT adoption and integration” (Buabeng-Andoh, 2012, p.137). It is critical that all schools ensure teachers have the training and skills, both technical and pedagogical before integrating technology into classroom instruction as simply introducing additional hardware into classrooms will not be advantageous if educators are not trained to use these tools effectively and meaningfully with curriculum content.

Buabeng-Andohs’ study (2012) explores many contributing factors behind teacher’s resistance to technology integration, many of which address the personal teacher (personal characteristics, attitudes, computer self efficiency), the teacher as a professional (teaching experience, workload), as well as technological and institutional concerns (professional development, accessibility, technical support, leadership support). Buabeng-Andoh (2012) speaks to boundless points, bringing attention to the rise of technology and how it that has implicated infictions on the integration by teachers in classroom. The “effective integration of technology into classroom practices poses a challenge to teachers”(Buabeng-Andoh, 2012, p. 147). Buabeng-Andoh speaks to the personal, institutional and technological factors and how research has revealed that each of these factors are in fact interrelated to each other.
2.5 Requirements For Successful Or Efficient Integration Of Technology In The Classroom

Technology and successful integration has been an evolving topic of discussion amongst educators for over thirty years (Lowther, Strahl, Inan, & Ross, 2008). A study conducted by Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur (2012) looks deeper into the topic of teacher beliefs and technology integration practices. They conducted a study that followed twelve K-12 classroom teachers. The teachers were purposefully selected based on their efficient use of technology practices in the classroom. As a result of this study and some others, it has been stated that there are a criteria of requirements set for the successful and efficient integration of technology in the classroom. Teachers expressed some main requirements to be: hardware, Internet, and software access, training, and support.

2.6 Hardware, Internet, and Software Access

Over the past two decades, in terms of hardware, Internet, and software access, substantial funds have been dedicated to increasing technology access in classrooms to enhance students learning. According to the NEA (National Education Association) survey of 2008, the majority being 74.1% of the 1934 educator participants reported that their access to computers, the Internet, and software was “adequate” to them as teachers. A high volume percent of those teachers (94.6%) reported having additional access to computers and the Internet at home to support daily lesson planning, recording/submitting grade, etc) (NEA, 2008). With sufficient and consistent access to technology in the classroom, teachers are better able to integrate sufficient and consistent
learning opportunities in respect to technology at any point throughout their teaching program.

2.7 Training

In terms of training, “professional training courses must be designed to identify beliefs about successful teaching, policies for enhanced teaching and learning and syllabus design for teaching purposes” (Buabeng-Andoh, 2012, p. 143). The main reason for successful implementation of technology is due to professional development as the results of recent studies have suggested that the majority of teachers reported feeling suitably trained to operate technology equipment in the classroom (68.3%), that they could search the Internet for information (71.1%), and use administrative software to complete tasks such as taking attendance and/or recording/submit grades (68.3%) (NEA, 2008). The National Education Association (NEA) results show that 57% of teachers felt adequately trained to integrate technology into instruction due to training (NEA, 2008). Furthermore, “the majority of teachers who participated in technology-related professional development in the year prior to completing the NCES 2009 survey found training to be relevant, with more than 80% agreeing: “it met my goals and needs,” “it supported the goals and standards of my state, district, and school,” and “it applied to technology available in my school” (Gray, 2010, p. 4)” (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012, p.425). Therefore, professional development and training sessions provide educators with the essential they need to effectively incorporate technology into their teaching.
2.8 Support

In terms of support, there are a variety of different types of support needed for teachers in order for them to effectively integrate technology, including administrative, technological, professional, and peer (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012, P.425). According to the results of the Speak Up 2010 survey conducted in 2011, “30% of the responding school/district administrators regarded technology support as a top challenge” (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012, P.425). This is also supported by data from another report, which reported that 83% of responding school districts employed a full or part time staff person in an educational technology leadership role; 68% reported that support for educational technology use was adequate (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012, p.425). Therefore, In addition to the use of technology coordinators, different strategies play a vital role in school administration in order to provide technology support in order to establish an environment for successful and efficient technology integration. Furthermore, the research has suggested that teachers are relying on social networking sites in order to interact with and learn from their peers and staff community (Luehmann & Tinelli, 2008). By interacting and collaborating with peers and staff communities, teachers are building

2.9 Conclusion

Technology integration in terms of theory and practice is an extensive topic in the realm of education today, however, it entail specific themes, as discussed throughout this literature review. The most prevalent theme is the fact that many educators are not necessarily fully equipped to implement this change, however they do recognize that with
the proper training and support, the objective for successful technology integration in classrooms is feasible and thus becoming prevalent in a few classrooms today. Therefore, technology combined with teachers with substantial teaching in respect to technology integration skills, provide the opportunity to revolutionize education as it is vital not only to ourselves but to the future of students and what lies ahead for them. Furthermore, there will be unique contribution to the existing research base in the field of teaching through the execution and findings of this study as it will work towards identifying teachers' perspectives, attitudes, and experiences in respect to what they find to be effective/not effective in respect to technology integration for non digital native teachers currently in the field along with their students.
Chapter Three: Methodology

3.0 Introduction

As a result of this generation and the rise of a digital age, students are further susceptible and attain a wide range of technology within modern day classrooms, some of which vary from computers, tablets, SMART Boards, etc. These forms of technology have the potential to allow content such as the curriculum to be taught more efficiently and are more relevant to students of this generation and generations to come. Current research states: “Contemporary young children are part of the generation of digital natives” (Fleer, 2011; Prensky, 2001a, 2001b). Due to the rapid development of technologies, it is evident that modern technology has changed children’s lives and the way in which students learn. Therefore, it is vital that teachers/educators rethink “the roles of technology in young children’s development and consequently the development of learning theories and curricula that meet the needs of contemporary children” (Fleer, 2011; Yelland, 2011). As teachers begin to rethink these needs, students will be better able to relate to and make sense of contemporary content.

This topic is significant as it attempts to address what technology integration means in theory and practice to teachers who have a demonstrated commitment to this work in their filed. This study addresses the differences and or similarities that arise from the teacher responses in respect to how they successfully integrate technology in their respective classrooms and how they have to come to this level of comfort in respect to the successful integration of technology in there respective classrooms/school community. Also it is particularly imperative for current and future educators, as it identifies whether there is a correlation in the range of responses that each withhold in regards to the
successful implementation of technology through theory and practice. This chapter further explains the steps and approaches that were took in order to successfully collect the data for this study, the participants, and the methods in which I analyzed the data.

3.1 Research Approach & Procedures

As the research pertaining to this study explores the range of responses in respect to what technology integration means in theory and practice to a sample of elementary teachers who have a demonstrated commitment to this work, the chosen research design has been established as Descriptive. This design is most appropriate as the research entails responses surrounding variables that influence another. Descriptive research is used to obtain information concerning the current status of the phenomena and to describe what currently exists with respect to variables in the research (Creswell, 2012).

As a result of the research explored in this study it is evident that for this analysis the most appropriate methodology was to conduct qualitative research. This specific design is most appropriate as its aim is to gather an in-depth understanding of the responses and experiences that educators have surrounding a topic and the reasons that influence that particular outcome. This method of data collection allows for the development of an in depth exploration of the phenomenon (Creswell, 2012, p. 205). In this case, according to the topic and research question a series of interviews were necessary, particularly interviews with educators, within a comfortable environment.
3.2 Instruments of Data Collection

This particular research study encompasses specific research methods that were used to accurately collect valid data for this particular study. The type of data that was collected was primary data as the information collected by the researcher was directly from the participants and used for the specific purpose of comparing and contrasting perceptions in relation to the study’s topic. In order to obtain primary data the study utilized the method of qualitative measures.

By collecting data through qualitative measures the researcher was able to obtain purposeful sampling by participants of their choice, in order to develop an in depth understanding of the phenomenon (Creswell, 2012, p.205-206). Therefore, semi-structured interviews were applied to gather data for the reason being that it encourages two-way communication, allows for further explanation, elaboration and questioning. Also the information obtained from these semi-structured interviews provided not only answers, but the rationale for their given responses.

By asking participants with open-ended questions “the participants can best voice their experiences unconstrained by any perspectives of the researcher or past research findings” (Creswell, 2012, p. 218). Each category/question in each interview relates to the variables in the research question as they each target five main categories. The categories consist of background information, perspectives/beliefs, practices, supports and challenges, next steps in regards to this study. According to literature it has been suggested, “by understanding how teachers use tools to aid their practice, we can further define their facilitating roles”(Matuk, Linn & Eylon, 2015, pg.232). As a result of the diverse responses in respect to this, categorizing the interviews allowed the researcher to
gain a more in-depth understanding as to how and in what content participant responses differ and or relate. Once the information for each category had been supplied and identified by each participant the study was then able to classify whether there are similarities and/or differences that surround the issue in respect to what technology integration means in theory and practice to a sample of elementary teachers who have a demonstrated commitment to this work.

In terms of the reliability and validity of this studies instrument, the interview questions produced responses that were clear and provided area for participants to elaborate and support their own rational. Each question was written and presented in a way that when it came to transcribing the information and raw data gathered, each participant’s answers were closely related in terms of format and significance to the data.

3.3 Participants

3.3.1 Sampling criteria

In terms of this study, the sample is three current elementary school teachers in Ontario. In order for this sample of teachers to qualify to be apart of this study, they all had to be:

- *Currently and actively teaching in an elementary school in Ontario (Jk-Grade 8)* – the rational for this criteria is so that the data being collected is being reflected upon current experiences
- *Be teaching form a minimum of 2-3 years*- the rational for this criteria is so the data being collected is a reflection of current experiences. Also, by
having more than one year experience, participants can recall and reflect on the progress they have made/are making

• *Integrate technology in their classroom on a daily/weekly bases* - the rational for this criteria is so the teaches can speak on how this consistency is affecting their instruction and their students learning on a daily/weekly basis

• *Have a demonstrated commitment to integrating technology successfully in their classroom in respect to the curriculum* - the rational for this criteria is so the teaches can speak on how this consistency is affecting their instruction and their students learning in terms of the integration being meaningful to the students and their work/learning

### 3.3.2 Sampling procedures

In order for the data to be collected for this particular study the researcher followed a step-by-step processes to ensure ethical procedures were being followed. Primarily there was a recruitment and consent stage. As the study entailed three educator interviews, the researcher had to review the sampling criteria when selecting participants and had to further retrieve their consent with the proper documentation (see Apendix A). I then contacted teacher associations and/or school boards and/or Principals and provide them with an overview of my research study. I provided the participant criteria and asked that these individuals/organizations distribute my information to teachers they believe may fulfill the criteria. In respect to potential ethical issues relevant to this strategy I provided my information rather than asking these individuals/organizations to provide me with the names and contact information of people they think would be suitable. This
helped to ensure that teachers were volunteering to participate rather than feeling obligated.

The next stage was the interview phase. The interviews were scheduled in 60-minute blocks this way all educators were able to select a time frame that best suited their individual schedules. The interviews consisted of the researcher and participant finding a comfortable and quiet space where the researcher was able to read each question while the participant followed with his/her responses, questions, and or comments. Finally, the data audiotapes were saved and further transcribed by the researcher. The researcher typed up all that had been audio recorded word for word from each participant. The time frame ranged according to phase. Recruitment and consent had a time frame of one week. The transcription phase was completed over a two-three week time frame.

3.3.3 Participant biographies

The qualitative research attained for this paper is compromised of the opinions, beliefs and experiences of two educators from two different institutions. In order to locate and discover these educators, I talked to colleagues and administrators from schools that I have volunteered at before. As a result, I managed to find two educators who claim to have entered the field of teaching just before the rising digital age and thus have had to re-evaluate their teaching methods and understandings in respect to the implementation of technology through teaching.
Wendall

Wendall works at Bishops (pseudonym) Elementary School, currently teaching a Grade 2/3 class. She has 8 years of experience working as a teacher with her school board, three of which she has taught at her current school. She also claims to have taught grades ranging from 1-3, as well as been able to experience working as a teacher librarian for three years. In addition to computer technology, Wendall has recently been integrating SMART Boards, laptops, tablets and iPads into her classroom. She claims to be an avid user of technology in her personal life, as she is often uses her smartphone and laptop. She is proficient in productivity software such as Microsoft Office and maintains a twitter account for her class and her teaching career. Wendall obtains a professional goal to not incorporate technology into her teaching but become familiar and comfortable with teaching through technology. Ensuring that her teaching with technology is meaningful and proves to be a tool to encourage/reinforce/enrich students learning. Some advice Wendall has for beginning teachers, who are committed to meaningful technology integration, includes being open-minded and to remember that as teachers we are forever learners. Becoming a teacher is a learning journey. She’d like for teachers to remember to never turn away an opportunity to learn more, to try anything and encourage those around you to do the same.

Katie

Katie works at “Easton” Elementary School, currently teaching a Kindergarten class. She has 16 years of experience working as a teacher with her school board, five of which she has taught at her current school. She also claims to have taught grades ranging
from JK-6, as well as been able to experience working as a planning time music and arts teacher for Grades JK-6. Katie believes to have begun implementing “more” technology in her classroom in her fifth year of teaching. In addition to computer technology, Katie has been integrating SMART Boards and tablets into her classroom. She claims to be a user of technology in her personal life, as she is often uses her smartphone and laptop, and as a parent, her own children are often eager to inform her of current technological trends. She is proficient in productivity software such as Microsoft Office. Her professional goal is to continue to learn and stay educated and current with new trends, new programs and tools that engage young learners. Some advice Katie has for beginning teachers who are committed to meaningful technology integration, is to continue to pursue innovative ways to integrate technology in classrooms because it is certainly the way of the future, it provides a whole other dimension to learning that can be quite a gift and an asset.

3.4 Data Analysis

Data analysis is the process in which the researcher takes part in a process for obtaining raw data and converting it into information that becomes useful and significant for the study intended. Data is collected and analyzed to answer questions, test hypotheses or contradict theories (Creswell, 2012). For the purpose of this particular study, when time came to analyze the data collected the researcher evaluated the transcribed narratives from the audio interview. Overall, the data was analyzed by the researcher according to participant responses. This approach was useful as the specific research question in this study already identify the main themes/categories used to group the data being collected and analyzed and then looks for similarities and differences. This
was done through a series of phases. This process of analysis answered the primary research question(s) as it allowed the researcher to identify similar and different themes from each interview to address the similar and different responses in respect to this research topic.

3.5 Ethical Review Procedures

This study follows ethical review standards provided by the Masters of Teaching Program at the Ontario Institute for Studies in Education. Before each of the interviews, research interviewees/participants were provided a letter of informed consent (See Appendix A), which was read and signed before being approved for an interview. This copy of consent was kept for the records of this study. Participants were informed that they had full confidentiality, as their identity was to be kept confidential at all times during the study through the use of pseudonyms and exclusion of identifying data. Throughout the study I do not refer to him/her in any written manner by their real name, which ensures the confidentiality of any information gathered. The information recorded was written objectively, treated professionally, and kept confidential. Participation was completely voluntary, participants were under no obligation to participate and if they did choose to participate, they were able to withdraw from the study at any time, without suffering any negative consequences.

The answers provided by participants were analyzed and transcribed alone by the primary researcher. The data collected was then used for the purpose of this research project, which was presented in a school report and presented in a final paper and conference. The data collected was kept in a secure manner. The data has be kept on the researcher’s computer under a secured zip file with a password where only the researcher
can gain access. All data collected for the study will be stored for up to 5 years and will further be securely deleted. A summary of results of the study may also be available upon request. There are no known risks involved with participation. Participants were continuously reminded that they might choose not to answer any question.

3.6 Methodological Limitations

There are several limitations to this study. First and foremost is the scope of the sample size. While, it will be possible to find a range of age groups in respect to educator participants, the sample size will be relatively small compared to other studies conducted in the past. This is significant as the studies results will only be a reflection of a small sample of teacher’s experiences and or beliefs. Second, are time constraints, as this study is being conducted for the purpose of a final thesis, the implementation and analysis of the study had a preset deadline. Lastly, another limitation of this study includes the fact that the only form of data collection is the interviews conducted, as observations and/or surveys were not an option. This limitation will not allow the research to observe how educators use technology within the classroom/school community.

3.7 Conclusion

Overall, this studies methodology will work to address and identify what the differences and or similarities that arise from the teacher responses in respect to how they successfully integrate technology in their respective classrooms and how they have come to this level of comfort in respect to the successful integration of technology in there respective classrooms/school community. I determined that the semi-structured interview protocol was the most suitable for this study. This form of data collection was suitable because it involved creating pre-determined questions, and it gave each of the
interviewees an opportunity to expand on several unforeseen areas of the research, some of which include administration and board support, rationale for technology integration in respective curriculum areas, etc. Next, I identified participants of the study by listing four specific criteria. Each set of criteria was determined in order to discover teachers who have demonstrated commitment to integrating technology successfully in their classroom in respect to the curriculum and student achievement. Following one-on-one interviews, I analyzed the data according to participant responses, which allowed me to group the data into predetermined categories that further highlighted any similarities and differences between participant responses. Furthermore, ethical review standards provided by the Masters of Teaching Program at the Ontario Institute for Studies in Education were followed in keeping identity confidential and authentic.
Chapter Four: Findings

4.0 Introduction

This chapter presents and discusses the findings that emerged through the data analysis phase of the research interviews conducted. Throughout the analysis process, I was constantly aware of my research question: “What does technology integration mean in theory and practice to a sample of elementary teachers who have a demonstrated commitment to this work?” while addressing the perspectives and experiences that these teachers hold in respect to technology and technology integration in their respective classrooms. Throughout the discussion of this chapter, connections are established and drawn between participants’ experiences and perceptions and existing literature that has been previously addressed in the Chapter 2 literature review. The findings are organized into four main themes:

1. Non-digital native teachers rely on school support and self-directed learning in order to develop confidence and competence in learning how to integrate technology within their classroom

2. The technology most commonly used in classrooms today consists of tablets, computers, iPads and SMART boards—most commonly implemented to engage lesson delivery and connect with 21st century global-mindedness

3. Teachers typically implement technology to enhance and assist with the delivery of the math, language and physical education curriculum, as it is engaging and advantageous for monitoring student progress

4. Teachers currently perceive technology integration to be beneficial yet disadvantageous to both their teaching as well as student leaning
These themes further explore several sub-themes that foster how each theme plays out in regards to the participants’ perspectives, and how they influence teacher practice in the classroom. Finally, I summarize my findings and make recommendations for next steps.

4.1 Non-Digital Native Teachers Rely On School Support And Self-Directed Learning In Order To Develop Confidence And Competence In Learning How To Integrate Technology Within Their Classroom

Technology has been increasingly present in classrooms since the beginning of the 21st century. As technology is ever progressing and becoming predominate in our schools today, participants noted strategies that allowed them to develop confidence and competence in respect to learning how to integrate these technologies in their classrooms. This provided educators ways in which they could improve their technological integration skills.

4.1.1 Teachers identify board/administration support as beneficial to the integration of technology in their classrooms

As a result of the interviews conducted, both participants referred to the support of resource staff at the board level to be useful in identifying ways in which to use technology within the school. Wendell stated, “With each passing year more and more direction is coming from administration with instruction to become more involved with technology.” Kayla supported this with the fact that her “school board requires teachers to have an ALP [Annual Learning Plan] updated every year. It is completed online and is meant to be sent to administrative staff and set up as a record of professional goals,”
which has challenged her to keep current with the changes currently taking place in education, and has put emphasis on a integrative approach.

The increasing focus on technology use in schools today and the shifts in ways that modern-day learners learn and acquire knowledge and information have impacted how technology is used in classrooms today. Currently, teachers utilize various technological tools to enhance their teaching. Such tools are beginning to become essential to the everyday classroom. Participants mentioned the access to technology as being a key reason for the development in their confidence and competence in respect to integration of technology in their classrooms and throughout the delivery of the curriculum. Wendell and Kayla both stated that, with the support of the board and administration that provided educators at their respective schools with tablets, laptops, and SMART boards in every classroom, teachers are better equipped to implement the feature of technology in their individual classrooms.

This finding aligns with the literature as it states, “teachers identify and integrate digital resources into their existing curriculum during the planning stages of their implementation” (Matuk, Linn & Eylon, 2015, p. 233). This is evident as teachers are now more than ever adapting to and integrating technology within their respective classrooms as well as in the wider school community. As technology is becoming more and more prevalent in teaching, it isn’t unusual to witness schools with greater access. According to the National Education Association (NEA) survey of 2008, the majority being 74.1% of the 1934 educator participants reported that their access to computers, the Internet, and software was “adequate” to them as teachers. A high percentage of those teachers (94.6%) reported having additional access to computers and the Internet to
support daily lesson planning, recording/submitting grade, etc.) (NEA, 2008). Therefore, consistent with research, the participants agree that board and administration support better equips teachers to implement technology in their classrooms.

4.1.2 Teachers agree teacher collaboration to be beneficial in respect to providing students with positive technology integration in the classroom

An effective teacher strives towards best practices, and along with best practice comes great teacher collaboration. Participants indicated teacher collaboration as a contributor to diffusing conflicting dynamics and fostering a collaborative culture that puts the students' learning first. This in turn, transforms the teacher's best practice into a practice that is consistent school wide. Therefore, teacher collaboration fosters community within the school and amongst administration, staff and students.

A benefit of collaborating is providing the opportunity to start up and join groups on social media and or in school to support their understanding of the role that technology can play in our classrooms. Kayla stated that her school offers engaging seminars that her and her colleagues can participate in to better their technology integration skills. She mentioned she often participates in the school’s “technology team where educators learn how to use technology in the classroom together, and share ideas.” She often relies on her colleagues as they “can help with technology implementation by sharing what tools worked for them and at times offer collaborative projects to be shared with multiple classes.” She also stated that she finds it beneficial when her and her colleagues “use online surveys and interactive chats to coordinate ideas with one another.” Wendall stated that she continues to gain confidence with the integration of technology as a result of “great support of my colleagues,” that “collaborating with other
professionals also provides support in respect to my growth with technology.” The research suggests that teachers are relying on social networking sites now more than ever, in order to interact with and learn from their peers and staff community (Luehmann & Tinelli, 2008). Therefore, literature supports participants’ views in this study, as they often share tools and rely on their colleagues for further assistance and guidance in respect to technology integration and skills.

4.1.3 Teachers are motivated to volunteer their time to learn and become familiar with ways in which to integrate technology in their classrooms to keep current

Findings suggest that teachers are beginning to volunteer their time to educate themselves in order to develop effective and appropriate strategies for technology integration and to better deliver and uncover the curriculum with their students on a regular basis. Kayla identified herself as an avid learner as she is a part of her schools’ “technology plan team,” participates in her schools’ weekly “tech Tuesdays, lunch-n-learn seminars,” participates in professional developments sessions, and motivates herself “by wanting to stay current and up to date in how to deliver the curriculum in an interactive way that pushes me to seek integration with technology.” In addition to this, as a parent Kayla also stated, “my own children need and use a range of devices and thus are often eager to inform me of current trends in regards to the latest forms of technology, while I practice.” Correspondingly, Wendell also identified as a member in her schools’ technology team where she “volunteers to learn how to use tables and laptops and how to integrate them in the classroom.” She has willingly “joined social media groups” outside of school and “often signs up for professional development courses offered through the
board.” Therefore, these participants provided evidence in respect to frequently using the resources available to them to keep current. Such resources provide them with opportunities to learn and show commitment to technology integration.

As noted in the literature, “access has expanded dramatically among families with 0- to 8-year-olds: in 2011, 8% had an iPad or similar tablet device; today, 40% do. In fact, almost as many children now have their own tablets as parents did two years ago” (Rideout, 2013, p. 20). Therefore, the participants of this study support the literature in respect to the widespread use of technology and main reasoning for successful implementation of technology being due to the implementation and interest of ongoing professional development (Buabeng-Andoh, 2012).

4.2 The Technology Most Commonly Used In Classrooms Today Consists Of Tablets, Computers, Ipad{s And SMART Boards—Most Commonly Implemented To Engage Lesson Delivery And Connect With 21st Century Global-Mindedness

There are a number of new technologies present in classrooms today—all of which allow students to explore a number of diverse platforms and navigate social networking, online teaching, blogs, podcasts, interactive whiteboards, and mobile devices. Through the use of a variety of technology such as iPads, tablet and computers in their classrooms, teachers expressed their rationale for when and how to implement such platforms.
4.2.1 Teachers implement a variety of technological platforms and/or tools such as iPads, tablets, computers and SMART boards in the classroom

Education through technology has opened new avenues and gateways for both students and teachers. In the past decade, the use of computers in classrooms has extended and become widespread. Far from just being confined to computer labs, computers are now woven through educational institutions whether they are transported by cart or permanently installed. According to the findings of this research, both Wendell and Kayla indicated that the most commonly used technological devices in schools today include “iPad carts provided by the board,” “tablet carts,” “computers,” and “SMART boards.” This increase in technological availability is mirrored by literature, which states that “over the past two decades, in terms of hardware, Internet, and software access, substantial funds have been dedicated to increasing technology access in classrooms to enhance students learning” (NEA, 2008).

4.2.2 Teachers are integrating technology in the classroom to assist themselves along with student learning in respect to student assessment, keeping up with current trends, and fostering a safe space for open communication

In more and more schools today, technology is recognized as an instructional tool. Often, students use technology in school to complete their assignments, do their research, and connect with their classmates, while teachers use it to keep track of their students, check on their work, and make grading them easier and more transparent. Kayla explained that she uses “current forms of technology to support learning in the classroom” as she finds it to be “an effective tool” that allows her to “tap into the current
trends, and approach teaching from a more global vision-connecting all learners.” She recognized that “they engage students and tend to offer another mode of delivering pertinent information and or lessons.” Particularly in respect to currently being a kindergarten teacher, Kayla explained that “in kindergarten, technology helps document student achievement through photos, films, checklists, timelines, etc.”

Wendell also viewed the rationale for technology integration to be a positive one as “it helps to make learning fun and keep students engaged and interested in their learning.” She believes “it helps students feel confident to learn alongside their classmates—for example, the non-readers become listeners comprehending the same text as their peers.” She also recognized that technology integration “helps to reinforce daily concepts and provides an opportunity for practice” through platforms such as Raz Kids, Tumblebooks, Mathletics, and Bookflix—to name a few.” She also addressed technology as being beneficial to language learners as programs such as “word cue helps them to spell and automatically moves he student along as they complete the levels and respond to the questions.”

In turn, these tools allow educators to fully understand why and how “it is important to be able to integrate technology into a related activity in subject teaching” (Cubukcuoglu, 2013, p. 58). Technologies such as the interactive whiteboards (SMART boards) enhance teaching, as they provide students with enhanced visual aids and teachers a more engaging and simpler gateway for presenting material throughout the execution of their lessons, while mobile devices allow teachers to deliver information to students in a quick and efficient manner. When technology is integrated appropriately in the classroom, teachers are able to interact with students at a more personal level in order
to assist with problem solving, responding to questions, and discussing topics related to the course in correspondence with the curriculum (Gorder, 2008). This was evident as Wendell explained how technology fosters a safe space for open communication as “it helps students feel confident to learn alongside their classmates” and supports them in direct relation to progression in respect to the curriculum. For example, Wendell stated the benefits of having “word cues to help students in literacy as it supports students spelling and automatically moves student along as they complete levels and respond to the follow-up questions.”

4.3 Teachers Typically Implement Technology To Enhance And Assist With The Delivery Of The Math, Language And Physical Education Curriculum, As It Is Engaging And Advantageous For Monitoring Student Progress

Implementing technology into classroom instruction entails more than just teaching students basic technology skills. In order for technology integration to be effective across the curriculum, teachers implement these platforms in ways that deepen and enhance the students’ learning process and outcomes in the respective subject area. In particular, it must support components of learning such as engagement, attention, assessment, and diversity. Effective technology implementation is achieved when the use of technology is relevant to the students, their learning, and the material or curriculum.
4.3.1 Teachers are integrating technology to assist with the delivery of curriculum in subject areas such as literacy, mathematics and physical education

Participants indicated that effective technology integration across the curriculum can deepen and enhance the learning process for both students and teachers. Technology has become a tool for learning that actively supports curriculum topics and classroom lessons. Wendall stated that with this technology she is able to teach “students about the useful and powerful ways of learning in a way that is interactive and informative.” In some cases these tools and platforms have become an instrument that students needed in order to perform and complete their work and/or tasks.

Teachers expressed that technology is most commonly used in their classrooms during gym, language/literacy, and mathematics. Wendell “typically” integrates technology “in language,” while Kayla stated that she finds it useful during “literacy, mathematics and daily physical activity,” through the use of a variety of computer programs and iPad/tablet applications. Fulton (1997) similarly indicates that teachers model technology fluency by using technology in the classroom by applying technology transversely throughout the curriculum.

4.3.2 Teachers integrate technology throughout the curriculum, as they believe it is engaging, global and beneficial for monitoring progress

Wendell stated that she “typically” integrates technology “in language,” She supported this point with the fact that she frequently integrates these platforms at this time in her curriculum delivery because she believes “that there are many options available for monitoring student progress.” Through applications and programs such as
“RAZKIDS,” students “are able to read at their level and answer comprehension questions.” Kayla explained that she uses technology to support her literacy program as well as it “engages students with learning in different ways;” for example, she now “uses YouTube videos for examples of DIY projects, open inquiry questions, etc.” She also integrates technology during gym and physical activity with her kindergarten class as it “denotes points for achievement as a part of daily physical activity.” Kayla also expressed that she integrates technology within the delivery of her curriculum as she strongly believes the various technology platforms and devises she implements assists her with her learning goal to “engage students, get connected with others in the world wide web community, encourage sharing and receiving of other perspectives.”

In relation to existing literature, it is well defined that “technology has been changing classroom practices and learning processes” (Lim, Zhao, Tondeur, Chai, & Tsai, 2013, pg. 59). Most importantly, “integrating technology in the classroom is not about teaching students to operate computers, but integrating technology is about helping teachers to use technology as a tool for learning” (Gorder, 2008, p. 63). This is useful and extends a teacher’s role, as it encourages “a shift in the role of the teacher from being the sole source of information to a more complex role of negotiating lesson objectives with students, providing a varying degree of support for different students, monitoring students’ progress, and encouraging reflection on classroom activities” (Lim, Zhao, Tondeur, Chai, & Tsai, 2013, pg. 59). The literature supports this as good practice as it has been demonstrated that “technology-mediated learning environments provide opportunities for students to search for and analyze information, solve problems, communicate and collaborate, hence equipping them with a set of competencies to be
competitive in the 21st century marketplace” (Lim, Zhao, Tondeur, Chai, & Tsai, 2013, pg. 59).

4.4 Teachers Currently Perceive Technology Integration To Be Beneficial Yet Disadvantageous To Both Their Teaching As Well As Student Learning

As we continue through the 21st century, technology continues to become more predominant in the classroom. iPads, tablets and computer technology are beginning to replace textbooks, and we have access to a plethora of resources at the palms of our hands and the tips of our fingers. The ways in which we use technology have completely altered how we carry out tasks and seek information. Educators have first handedly been able to experience and witness the benefits that technology is having on the profession of teaching in education. This is being accomplished through the willingness to learn and understanding the significance it has on our students future.

4.4.1 Educators have first handedly been able to experience and witness the benefits that technology is having on the profession of teaching in education

Wendell stated that as an educator, she would “love the opportunity for more” technology integration at her school. She believes that in order for educators to be successful in integrating technology meaningfully, they must “be open-minded” that they must be eager to “try anything and encourage those around you to do the same.” Kayla recognized this too and she addressed how she is beginning to become comfortable with technology integration as she stated, “although I still have a long way to go in being a technological wiz, comfort only came when I faced my fears through trial and error
through various modes of technology.” She believes that educators should “continue to pursue innovative ways to integrate technology in the classroom because it is certainly the way of the future and it provides a whole other dimension to learning that can be a gift and an asset.” She trusts that if we “treat technology as an essential tool and not a ‘fun reward’” it will better support “students and fellow colleagues to believe that technology is an integral part of our teaching for the future”

Previous research by Cubukcuoglu (2013) states that believing in the advantages and benefits of using technology in the classroom are vital factors that encourage more frequent use by teachers and staff. It supports the notion that “by understanding how teachers use tools to aid their practice, we can further define their facilitating roles” (Matuk, Linn & Eylon, 2015, pg. 232), thus connecting all learners to the curriculum being delivered and the varying understandings of the curriculum being delivered. Similarly, Kayla stated her strong belief that the various technology platforms she implements assists her with engaging students to get connected with others and encourages sharing and receiving of other perspectives and understandings.

4.4.2 Some teachers believe technology can be a negative tool in the field of teaching as it requires much funding, additional support, and time for professional development

Despite the benefits that teachers noted could arise from integrating technology in the classroom, there is also evidence from the research to support the notion that there are negative teacher perspectives in respect to integrating technology in the classroom. Primarily, Wendell believed that with technology integration educators are “faced with a
She indicated that “unfortunately many of the great technology resources online require a subscription that can be very expensive” and “if the school does not fund the program then it can present itself to be difficult/impossible to take part.” She also brought attention to the fact that “schools in affluent neighborhoods are more fortunate due to fundraisers, and parent council support where money is raised to purchase such items.” Overall, Wendell believed that teachers need to be presented with the “opportunity to learn and grow in their learning for teaching” with technology.

Kayla noted that a current challenge she is facing with this integration of technology is the demand for additional “money, funding, and physical settings.” It is evident that there has been “some reliance to the internet” and this reliance is beginning to manifest, as opposed to being a “more collaborative approach” between teachers.

In addition to this, Kayla stated that there is a sense of “fear, as there is not enough support to get teachers out of their comfort zones” with technology. She believes that there needs to be more “professional development” and “additional supports” to support technology integration. This training would be beneficial as some challenges she faces with technology integration are “system glitches, crashes, programs that shut down, when the hardware breaks or simply doesn’t work effectively.

According to the NEA (National Education Association) survey of 2008, the majority being 74.1% of the 1934 educator participants reported that their access to computers, the Internet, and software was “adequate” to them as teachers (NEA, 2008). In respect to the Speak Up 2010 survey conducted in 2011, “30% of the responding school/district administrators regarded technology support as a top challenge” (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012, p. 425). This supports Kayla’s
statement in regards to current challenges she is facing with this integration of technology in respect to money, funding, and the physical settings of her classroom and technology.

Previous studies have made it apparent that “effective integration of technology into classroom practices poses a challenge to teachers” (Buabeng-Andoh, 2012, p. 147), therefore supporting the need to address this issue throughout this research. Many educators have purported this as a deficiency that “can be attributed to an insufficient number of hours of professional development” (Lawless & Pellegrino, 2007, pg. 576). Therefore the participants highlighted professional development as a key factor to technology integration success as much as existing research does; “professional training courses must be designed to identify beliefs about successful teaching, policies for enhanced teaching and learning and syllabus design for teaching purposes” (Buabeng-Andoh, 2012, p. 143).

4.4.3 Teachers believe technology to be a beneficial and useful tool for student learning as it is both interactive and informative as it caters to students with diverse learning needs

From experience and observation, teachers credited that when students are using technology as a tool, they are in an active, more immersive role rather than a passive/recipient role where they are simply scratching the surface of retaining information transmitted by a teacher and/or textbook. With the proper use of technology, students are actively making choices about how to generate, obtain, and/or manipulate information and material. Technology provides users with a more active approach to
thinking about information, choice, and accomplishing tasks while attaining skills. For a student in today’s age, Kaya indicated that technology provides “a way of keeping current, expanding horizons in terms of perspective and point of view and recognizing that technology can be a very effective tool in learning.” Wendell recognized technology as a tool that is a “useful and powerful way of learning and is both interactive and informative” for students by teachers; she stated that technology:

Provides students with various learning needs an opportunity to learn at their own pace with perhaps some models that are beneficial for them. I.e. Visual learners will benefit from attractive images, and videos; while non-readers will benefit from having text read to them.

Literature supports that fact that teachers believe technology to be a positive tool for students as they are “now more engaged and are able to make better connections between their previous learning experiences and the new concepts or principles being taught” (Lim, Zhao, Tondeur, Chai, & Tsai, 2013, pg. 59). Therefore, it supports participants’ belief that “when children become creators of learning, the technologies can be either used as tools or tutees (Hsin, Li, & Tsai, 2014).

4.4.4 Some teachers believe technology to be a disadvantage for students as they believe it to be distracting, misinterpreting, and a tool that encourage/fosters dependency

Some educators still view the integration of technology in the classroom as a disadvantage. Wendell was concerned that technology is “somewhat distracting to students” and “may cause to perhaps fall short of expectations-doing research and
responding with only the information from Wikipedia, could present itself problematic.” Through the interview, Kayla noted that teachers find that technology can be a disadvantage in respect to learning as students may begin to “develop a dependency on technology, not communicate well resulting in a social skills gap, put less emphasis on physical activity and less value on writing and correct spelling.” The National Association for the Education of Young Children seems to agree, stating that they believe that there are possible negative outcomes that have been identified, such as negative impact on socialization and language development, and the increase in the amount of time young children are spending in front of screens/technology (Radich, 2013, p. 3).

4.5 Conclusion

In conclusion, through the analysis process, four main themes emerged. Each of these themes contributes to what technology integration means in theory and practice to a sample of elementary teachers who have a demonstrated commitment to this work. Primarily, the theme of how non-digital native teachers develop confidence in competence in learning how to integrate technology within their classroom features multiple trends. Some of these trends include: the dependence teachers have on support from the board of education as well as administration in order to support their own personal growth as educators as well as proficient users of modern technology, teacher collaboration, as well as self-motivation. Secondly, through the analysis of my second finding, which concerns how and why technology is most commonly used in classrooms today it was learned that teachers underlined technology integration as a tool, mainly infused in classroom learning in order to enhance and engage student learning. Next, my third finding, which uncovers the curriculum areas in which teachers typically implement
technology, presented the fact that teacher mainly implement technology during math, literacy and physical education. Teachers believe these subjects allow technology to enhance and assist with the delivery of curriculum, as it engages students and allows teachers, as well as students to monitor student progress and achievements. Finally, my fourth finding addresses how teachers currently continue to perceive technology integration to be beneficial yet disadvantageous to both, their teaching as well as student leaning.

These findings make a significant contribution to the existing literature by focusing on how teachers who identify as a digital natives, have come to acquire confidence and competence in respect to integrating technology in their classrooms successfully. Emphasising how technology can be a beneficial tool in the classroom and in what ways the idea of integrating technology in the classroom can be better enhanced in terms of next steps for both teachers as well as administration. Next in Chapter 5, I discuss the broad and narrow implications in relation to these findings, provide recommendations and note potential areas in respect to further research for the educational community.
Chapter Five: Discussion

5.0 Introduction

In this chapter, I discuss the overall implications and significance of the research conducted in this research study. I begin by reviewing my key findings in respects to what technology integration means in theory and practice to a sample of elementary teachers who have a demonstrated commitment to this work. Then, I discuss the implications of these findings, both for the educational community and my own practice as a beginning teacher in the field of education. With this in mind, I make further recommendations, which may support other educational professionals such as teachers, administration, and the wider school community. Finally, I pose questions and suggestions in respect to areas that I believe would benefit from further research and discussion.

5.1 Overview of Key Findings and their Significance

As discussed in the previous chapter of this study, technology has been increasingly present in classrooms since the beginning of the 21st century. As technology is ever progressing and becoming predominate in our schools today, teachers are beginning to develop confidence and competence in respects to technology integration in their respective classrooms. The findings highlight how teachers who have identified as digital natives, have come to acquire confidence and competence in respects to integrating technology in their classrooms successfully in various ways. Ultimately, teachers expressed how technology could be a slight burden in some aspects of teaching, yet a beneficial tool in the classroom. They further explicated the ways in which they
were/are able to reap the benefits of technology integration and all it has to offer in respects to student learning and the delivery of curriculum.

Primarily, the findings of this study highlighted the school board and administration supports, along with the support and collaboration of other teachers and self-motivation—the willingness to learn—as being of great significance when developing their confidence and competence in learning how to integrate technology within their classroom. With the assistance of a variety of professional development opportunities and the access to a range of technological platforms, teachers are better able to familiarize themselves and their students to advantages that technology has to offer. As they feel better equipped to implement the feature of technology in their respective classrooms while feeling confident to share their learning’s with other colleagues. Therefore, fostering community within the school and amongst administration, staff and students.

Secondly, teachers expressed that the technology most commonly used in classrooms today consists of tablets, computers, iPads and SMART Boards. Teachers typically implement these platforms to enhance and assist with the delivery of curriculum, particularly math, language and physical education. They view these platforms to be of great significance for both teachers and students. Teachers believe there platforms enhance and assist with the delivery of curriculum, as these platforms are perceived as being engaging for lesson delivery, beneficial for assessment and allow students to establish a connection with 21st century global-mindedness, by connecting all learners. Therefore, by supporting students with enhanced supports such as technology, teachers
are provided with a more engaging gateway for presenting material in a quick and efficient manner.

Finally, teachers currently perceive technology integration to be beneficial yet disadvantageous to both their teaching as well as student learning. The findings reveal how teachers credit that when students are using technology as a tool, they are in an active, more immersive role rather than a passive/recipient role where they are simply scratching the surface of retaining information transmitted by a teacher and/or textbook. Teachers agree that with the proper use of technology, students are actively involved in their learning, as it provides students with a more active approach to thinking about information, choice, and accomplishing tasks while attaining skills.

Furthermore, despite the benefits that teachers noted could arise from integrating technology in the classroom, there is also evidence to support the notion that there are still some negative teacher perspectives in respect to integrating technology in the classroom. Some of these negative teacher perspectives surround the topics of funding, distraction, access and the physical setting in which the technology may be implemented in. This finding is significant as it emphasizes the next steps that need to be considered when enhancing the notion of best practices in respects to the integration of technology in the classroom.

5.2 Implications

In this section, I outline the implications of my research for both those in the educational research community – including teachers, school boards, administration, and educational professionals – along with my own practice and development as a teacher.
5.2.1 The educational community

As it is evident that technology integration and investment in schools has increased over last few decades, much of this investment has been made based on the belief that “technology-mediated learning environments provide opportunities for students to search for and analyze information, solve problems, communicate and collaborate, hence equipping them with a set of competencies to be competitive in the 21\textsuperscript{st} century marketplace” (Lim, Zhao, Tondeur, Chai, & Tsai, 2013, pg. 59). Therefore, emphasizing that the act of integrating meaningful technology tools into the classroom and across the curriculum is becoming a vital component of sufficient teaching and best practices. Given this, and both participants’ acknowledgement that technology has its benefits, but could be better supported in respects to funding, distraction, access and the physical setting, there is more effort to be made in order for all schools and teachers to reach the desired standards of attaining a great level of confidence and competence in respects to seamlessly integrating technology in their classrooms. Thus, the findings of this study are greatly significant to the educational community.

As both participants highlighted the prerequisite for continuous board and administration support, it is evident that pre-service along with in-service teachers could benefit from ongoing professional development workshops and conferences in respects to learning how and when to integrate a variety of technological platforms in their respective classrooms and with their students, as technology is ever evolving and progressing with each coming year.

Both participants also highlighted the fact that as technology is becoming the way of the future, teachers must continue to pursue innovative ways to integrate technology in
the classroom as it provides a whole other dimension to learning that can be an asset to all students’ futures. They believe, that if teachers integrate technology as an essential tool and not a ‘fun reward’ it will better support students and fellow colleagues to acknowledge and appreciate technology as an integral part of the future teaching profession and student learning. Therefore, promoting the curriculum, and the classroom and school community.

5.2.2 My professional identity and practice

As a Registered Early Childhood Educator and a teacher candidate, I have always had a strong commitment to integrating technology across the curriculum and within the school community meaningfully to enhance the teaching profession and student learning. As a result of conducting research in respect to how and why teachers integrated technology in their classrooms in the way that they do, I am confident that I have furthered my own understanding of how one comes to develop confidence and competence in respects to technology integration in theory and practice. With that being said, I am committed to embracing and advocating for many of the unique strategies, rationales, and suggestions that teachers have and use in respects to technology integration in the classroom in my own practice as a teacher.

After investigating, analyzing, and understanding the perspectives of a small sample of teachers, it is evident that technology plays a vital role in students’ lives. In my own teaching, I will always strive to open-minded to the possibilities of technology in order in order to be successful in integrating it meaningfully in my classroom. I will allow this knowledge to inform my teaching as I aim to create an engaging classroom where students can practice with and utilize tools that will befit and support them in the
future at reaching their full potential – individually, professionally, and globally.

5.3 Recommendations

Lifelong learning is one of the many rewarding aspects of being an educational professional. In my own opinion, and from experience, the greatest teachers are those who demonstrate an ongoing commitment to learning, being mindful, and reflecting on their own teaching practices in order to better their practice in respects to reaching their students’ learning in unique and innovative ways. With that being said, I feel that the findings of this research study support the need for alternative ways to further professional learning in various areas.

I believe teachers and teacher candidates could benefit from professional development that caters to supporting technology integration in every curriculum area. Doing so, provides ways in which teachers and the school community can go about keeping these platforms consistent, meaningful, attainable and relevant for all students. By receiving support from the school boards and administration in respect to integrating consistent platforms will particularly assist those who have exceptionalities and those who come from lower income families and may not be able to attain a devise which later impacts the student when he/she is unfamiliar with the platform of choice. In the same respect, there needs to be professional development and/or additional supports that also cater to anxiety in relation to technology, and the fears of risk taking. Therefore, providing teachers with the sufficient training to faces their fears with technology integration in respects to system glitches, crashes, programs that shut down, when the hardware breaks or simply doesn’t work effectively.
Also, I believe the school boards should take into account the need to reevaluate how they determine which of their schools get the funding they do, in order to attain these various technological platforms. This is significant as some teachers have noticed inequitableness in respects to schools that attain a plethora of recourses in respects to technology as oppose to those who don’t and belong to the same family of schools with in their respective board.

5.4 Areas for Further Research

Much like the research regarding technology integration, how teachers are developing confidence and competence in integrating technology is definitely on the rise. Many studies have found that a vital component of effective technology integration is the teachers' proficiency and ability to adapt technology to meet the needs of his/her students. This is evident as “Teachers know their content and pedagogy, but when it comes to technology, teachers often learn along with students” (Gorder, 2008, p.63). I am confident that, through my research, I have been able to build upon existing research and delve further into issues pertaining to the topic – specifically, the actions that teachers take or find useful when building confidence with integrating technology in their classrooms and with the curriculum.

I believe that further research should be done to explore teachers who don’t integrate technology in the curriculum subject areas and learn why they choose not to. In addition, I believe that I briefly skimmed the surface in my research pertaining to fear in respect to technology. As Kayla stated, there is a sense of “fear, as there is not enough support to get teachers out of their comfort zones” with technology. I believe that further
research should be done to examine what aspects of technology integration triggers fear and a sense of discomfort for teachers. I believe this is of significance, as we should understand how this could be overcome for both pre-service and in-service teachers.

5.5 Concluding Comments

In this chapter, I provided a short summary of my findings as outlined in Chapter 4, in regards to how teachers who have identified as digital natives have come to acquire confidence and competence in respects to integrating technology in their classrooms successfully. Acquiring confidence and competence in respects to integrating technology is a skill that should be acquired in order to teach future generations in this rising digital age. I highlight this study of research as being an essential topic through the overview and significance of my findings as technology is ever present and currently playing a vital role in children’s lives today, as they are currently living in a world enveloped by technologies and use technologies on a daily basis (Hague & Payton, 2012). Students are further susceptible to the assets of technology use and attain a wide range of technology within modern day classrooms, some of which vary from computers, tablets, SMART Boards, etc. These forms of technology have the potential to allow teachers to enhance content such as the curriculum to be taught more efficiently and are more relevant to students of this generation and generations to come. Therefore, the need for technologically literate teachers is becoming more and more imperative as technology continues to advance and develop.

I then go on to highlight the significance of the findings for the educational community, consisting of other teachers as well as administration and school boards, in order to highlight the strategies needs to implement continuous support in order to
support all teacher and students through the integration across the curriculum, student learning and teaching practice. Following these points, I go on to emphasize the significance of my study on my own personal practice as a Registered Early childhood Educator and teacher. This includes embracing and advocating for many of the unique strategies, rationales, and suggestions that teachers have and use in respects to technology integration in the classroom. Stressing the fact that by having an open-mind to the possibilities of technology, teachers can be successful in integrating technology meaningfully in the classroom, further allowing students to become familiarized with tools that will benefit and support them in the future at reaching their full potential – individually, professionally, and globally.

With this in mind, I then outlined various recommendations in light of my research, such as further professional development for teachers to be able to reach out to the school-wide community in order to go about keeping these platforms consistent, meaningful, attainable and relevant for all students, no matter what their abilities, financial state, etc. may be. I then consider areas for possible further research, such as exploring further the rationale behind whether or not a teacher chooses to integrate technology in their own classrooms, while also looking further into the aspect of fear and risk-taking when teachers think about integrating technology in their classrooms. As teachers it is vital that we constantly keeping current and doing all that we can to feed ourselves as lifelong learners. Overall, I feel this study has the opened up opportunity in respects to making great strides in the area of gaining confidence and competence integrating technology in theory and practice as teachers, by providing information on how this is currently being done in the field of education.


Brown, M., & Edelson, D. (2003). Teaching as design: Can we better understand the ways in which teachers use materials so we can better design materials to support their changes in practice. Evanston, IL: The Center for Learning Technologies in Urban Schools.


Appendix A: Consent Letter

Date:

Dear ________________________________,

My Name is Jovi Monteiro 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 what technology integration means in theory and practice to a sample of non-digital native elementary teachers who have a demonstrated commitment to this work and implement it in their classrooms as an informative tool. I am interested in interviewing teachers with a minimum of 5 years teaching experience and currently successfully integrate technology in their classroom. 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 Dr. Angela MacDonald. 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,
Jovi Monteiro

Course Instructor’s Name: Dr. Angela MacDonald

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 Jovi Monteiro 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. My research will focus on what technology integration means in theory and practice to a sample of non-digital native elementary teachers who have a demonstrated commitment to this work and implement it in their classrooms as an informative tool. This interview will last approximately 45-60 minutes, and I will ask you a series of questions focused on what technology integration means to you and how you have demonstrated successful commitment to this work. 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. What grade do you currently teach?
2. For how long have you been teaching?
3. In what year of your teaching career did you begin integrating technology into your practice?
4. Have you attended any workshops/classes/in-services that surround the topic of technology integration? Approx... how many?

Teacher Perspectives/Beliefs

1. What does technology integration mean to you? What do you believe it to be?
2. Do you integrate technology in your practice according to any particular theory/theories?
3. In your opinion and from your experiences, what are some of the pros of integrating technology in the classroom?
4. In your opinion and from your experiences, what are some of the cons of integrating technology in the classroom?

Teacher Practices

1. How did you develop confidence in competence in learning how to integrate technology in the classroom?
2. What technologies do you integrate and why?
3. How do you integrate these technologies?
4. In what curricular subject areas do you typically integrate technology and why?

5. How do your students respond to technology integration?

Supports and Challenges

1. What factors and resources, if any, support you in respects to how you integrate technology in your classroom?
2. What challenges do you encounter and how do you respond to these challenges, in respects to integrating technology?
3. How might the education system further support you and other educators in meeting these challenges?

Next Steps

1. What are some of your professional goals in respects to technology integration in your classroom and possibly the wider school community?
2. What advice may you have for beginning teachers who are committed to the topic at hand?

Thank you for your participation in this research study.