Electronic Theses and Dissertations   Theses, Dissertations, and Major Papers

10-19-2015

e-Literacy Trends in Ontario's 21st Century Education: Successes, Challenges, and Possibilities

Nathan Joseph Briffa
University of Windsor

Follow this and additional works at: https://scholar.uwindsor.ca/etd

e-LITERACY TRENDS IN ONTARIO'S 21st CENTURY EDUCATION:
SUCCESSES, CHALLENGES, AND POSSIBILITIES

by

Nathan J. Briffa

A Thesis
Submitted to the Faculty of Graduate Studies
through Education and Academic Development
in Partial Fulfillment of the Requirements for
the Degree of Master of Education at the
University of Windsor

Windsor, Ontario, Canada

e-LITERACY TRENDS IN ONTARIO'S 21st CENTURY EDUCATION:
SUCCESSES, CHALLENGES, AND POSSIBILITIES

by

Nathan J. Briffa

APPROVED BY:

_____
R. Douglass-Chin
Department of English Language, Literature, & Creative Writing

_____
F. Cherian
Faculty of Education and Academic Development

_____
Z. Zhang
Faculty of Education and Academic Development

21 September 2015

AUTHOR'S DECLARATION OF ORIGINALITY

I hereby certify that I am the sole author of this thesis and that no part of this thesis has been published or submitted for publication.

I certify that, to the best of my knowledge, my thesis does not infringe upon anyone's copyright nor violate any proprietary rights and that any ideas, techniques, quotations, or any other material from the work of other people included in my thesis, published or otherwise, are fully acknowledged in accordance with the standard referencing practices. Furthermore, to the extent that I have included copyrighted material that surpasses the bounds of fair dealing within the meaning of the Canada Copyright Act, I certify that I have obtained a written permission from the copyright owner(s) to include such material(s) in my thesis and have included copies of such copyright clearances to my appendix.

I declare that this is a true copy of my thesis, including any final revisions, as approved by my thesis committee and the Graduate Studies office, and that this thesis has not been submitted for a higher degree to any other University or Institution.

ABSTRACT

Technological ubiquity in 21st century Canadian society calls for responsible use of information and communication technologies (ICTs). This thesis presents e-literacy theory, developed from a review of international benchmarks to address domains of capability, critical literacy, citizenry, and safety, to confront this need for K-12 education and teacher preparation.

This study examines a selection of Ontario's K-12 curricula and lived experiences of teacher candidates from a teacher education institution in Ontario. Eighty-four teacher candidates participated in an online survey questionnaire and eight participated in focus group discussions to help provide critical understanding of the current climate of e-literacy in teacher education.

Findings indicated both Ontario's K-12 curricula and the target institution are lagging behind international benchmarks of e-literacy. With the goal of reform across three interdependent levels, this thesis presents the trident approach, specifically focusing on integrating e-literacy into 21st century learning through teacher candidates who will become the next generation of educators in K-12 classrooms.

DEDICATION

This thesis is dedicated to those who seek to balance
the forces of ignorance and deception
by cultivating our children with the gifts of knowledge and critical awareness.

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Modern advances in information and communication technologies (ICTs),

specifically the rapid proliferation of handheld devices and wireless infrastructures, have

contributed to a ubiquitous state of technology in Canadian society (ITU, 2014). The spread

of ICTs in mainstream society has also permeated Ontario's K-12 education system. While

the review of relevant literature I have conducted reveals many initiatives aimed at

integrating ICTs into education, it has also exposed a distinct lack of directives aimed at the

responsible use of ICTs, a concept that I adapt the term "e-literacy" to define.

Filling this gap in the literature on e-literacy, concerning the responsible use of ICTs,

is key to society's progress as we seek to embrace the ubiquity of technological

advancement: First, technology is developed and introduced; second, it is used. The next and

most critical step is that technology *must* be used *well*, because as a tool, it is essential for its

potential to be fully realized. The 21st century reality of rapid and widespread ICT

proliferation means that it cannot be reasonably expected that everyone, everywhere will

spontaneously and simultaneously develop the ability to use technologies responsibly. The

solution lies in the democratic institute of public education for all – specifically, in

Kindergarten to Grade 12 (K-12) education. However, even this institution is lagging

woefully behind the times as it struggles to adapt to 21st century realities, such as the

efficient, effective, and responsible use of ICTs.

The term e-literacy has been used in literature to define a vast array of ICT-related

skills, some more comprehensive than others ("Welcome to the Journal of eLiteracy," 2004;

"e-literacy," 2007; "The E-Literacy Programme," 2015; Ogwo, 2011). In envisioning a future

where individuals are equipped with knowledge and practical skills of responsible ICT use, I

have appropriated and redefined the term "e-literacy" for the purpose of devising a more

holistic application of it. The merit of e-literacy does not, however, simply manifest through reinterpretation and redefinition. Rather, the utility of e-literacy begins with an evolution and combination of technological and traditional literacies, and coalesces into a unique and relevant theory designed to shape educational policy, to improve curricular design, and to cultivate the responsible use of ICTs in the 21st century and beyond.

In short, e-literacy is the responsible use of ICTs and is comprised of technological literacies and traditional literacies. The technological literacies consist of digital literacy, ICT literacy, and media literacy found throughout a range of documents which I examine in the literature review. Combined with these are more traditional literacies, which I call "the four domains of e-literacy," and these domains represent the knowledge and skills of capability, critical literacy, citizenry, and safety that promote responsible ICT use. *Capability* refers to the requisite access to technology as well as the knowledge, skills, and abilities that are necessary to operate ICT-based hardware and software. *Critical literacy* emphasizes and expands on the critical skills required for the responsible consumption and creation of media through ICTs. As an institution aimed at preparing literate students for life in society (Noddings, 2007, p. 8), democratic education represents the cornerstone of *citizenry* that fosters ideals of inclusion, collaboration, and positive communication in both the real world and in virtual environments. *Safety* emphasizes and encourages the adoption of proactive and preventative measures designed to protect ICT users from the inherent dangers of online and offline environments.

My interest in the efficient, effective, and responsible use of ICTs was initially piqued as I completed my Bachelor of Education degree in 2013-14. Throughout that process, I was able to reflect upon my previous experience as a teacher in Japan from 2007-2012. During that time a technological phenomenon occurred – the introduction of Smart phones – that gave technological ubiquity a turbo boost that continues to increase today. Throughout my

graduate studies, I was able to work with two professors who guided my interests on this subject; one aided my exploration of technological theories and principles, and the other channeled my interest in literacy and its interdisciplinary roles across curricula. Drawing from these experiences, I have observed a need for a new branch of literacy that collects useful elements aimed at responsible use and applies them to the field of ICTs. The potential that e-literacy theory and practice has for education lies in the pursuit of preparing students for the challenges of the 21st century and beyond.

I envision this thesis as an act of filial piety, through which I have the opportunity to give back to my mentors and colleagues, and to the cities that have cultivated my experiences, both home and abroad. I also see this research as a chance to contribute to related fields and extend the work of theorists and researchers toward a theory leveraged at providing new direction for updating administrative policies, for improving teacher education programmes, and in refining classroom pedagogies and andragogies. The study was conducted at a teacher education institution in Ontario, Canada, and could not have been completed without the participation and input of volunteer teacher candidates. My confidence in this thesis stems from the uniqueness of and urgent necessity for this study and its recommendations: While the target institution in the research explicitly and implicitly endorses principles governing the responsible use of ICTs through coursework and practicum placements, very little direct work has been done to measure or ascertain the institution's effectiveness in actualizing e-literacy within 21st century contexts of teacher preparation and education.

In Fall of 2015, Bachelor of Education programmes across Ontario will be expanding from one year to two years in duration. I believe that this expansion is the perfect opportunity for teacher education institutions to improve course offerings and content related to e-literacy theory and practice. In fact, this time of transition in Ontario reveals a unique opportunity: By

seizing the initiative and becoming a leader in e-literacy theory and practice in teacher education, an institution could establish itself as a provincial, national, or even an international leader and trendsetter.

1.1 Research Questions

e-Literacy is defined as the responsible use of ICTs. This study was guided by the following research questions:

- What are the international trends and benchmarks of e-literacy in education and how do Ontario's K-12 curricula incorporate these benchmarks into 21st century revisions?

- What can the lived experiences of teacher candidates reveal about the target institution's theoretical and practical requirements of e-literacy for in-class and practicum assessment?

- How can the lived experiences of teacher candidates, with respect to e-literacy theory and practice, contribute to the development of teacher education programmes in the 21st century?

1.2 Purpose

Fifteen years into the 21st century people all over the world are using ICTs more and more in the workplace and for social applications. As Canadian society has evolved, gradually shifting from agricultural to industrial-based economies, the 21st century is witnessing an unprecedented leap toward a knowledge-based economy (Aucoin, 2011), where the ability to use ICTs is a skill set that is increasingly important for all members of society. Each year, teacher candidates in Ontario graduate with the aim of entering the workforce, and it is assumed that these teachers are equipped with the skills, abilities, and knowledge to prepare students for the challenges of the 21st century. After all, preparing students for life in society is one of the aims of democratic education (Noddings, 2005,

2007). However, considering the potential good that technology has to offer, there also exists the potential for harm, which is why "[t]eachers and students need to be aware of these negative aspects of computerization so that they will be less likely to become victims of the negative outcomes of a computerized society" (Poole, 2009, p. 305). Are teachers being proactively prepared for the challenges of life and education in the information age of technology?

With the aim of devising a theory of e-literacy knowledge and practice, my goal is to engage the issue of 21st century teacher education through the research questions. e-Literacy represents a new skill set that goes beyond the basic use of ICTs advocated by 20th century education; instead, e-literacy is designed to support that capability by promoting the critical, responsible, ethical, and safe use of ICTs. Based on the technological needs of society today, I believe that e-literacy has a role to play in any education system that is dedicated to the goal of preparing students for life in the society of tomorrow. This task is carried out by building upon the work conducted by theorists and researchers to develop the concept of e-literacy and to employ sound methodologies that promote rigorous, relevant, and ethical forms of inquiry. I anticipate my study will extend the literature in the following three ways: (a) by reshaping teacher education ideology, structure, and practices to meet the demands of the 21st century and beyond; (b) by contributing to the academic conversation of e-learning through the development of e-literacy theory and practice; and (c) by promoting a paradigm-shift towards strategies that improve andragogical theories and practices in teacher education to have positive outcomes on pedagogy in 21st century K-12 classrooms.

As I mentioned in the introduction, I recently completed the Bachelor of Education degree in Ontario. It was through reflections on my time as a teacher candidate that I first came to a jarring realization: I had received next to no preparation or training on the responsible use of ICTs. My personal experience led me to investigate, in the form of a

research thesis, the lived experiences of many other teacher candidates. Thus, the data collection tools were selected to identify and explore the lived experiences of teacher candidates to inquire about the conditions surrounding e-literacy in two areas of their teacher training: (a) teacher education courses, and (b) practicum placements. The purpose of this inquiry is to explore a range of perspectives outside of my own lived experience of the teacher education programme, and to raise awareness about successes, challenges, and possibilities that represent the next stage of theory and practice on the responsible use of ICTs.

1.3 Theoretical Framework

The research conducted in this study is structured using three separate frameworks to guide the investigation of each research question.

1.3.1 ISTE

The first framework is borrowed from the International Society for Technology in Education (ISTE), because they present a holistic approach to maximize the benefits of ICTs in education. In order for educational institutions to realize the learning potential of ICTs, ISTE believes that administrators, students, and teachers must work toward cultivating a pro-technology culture (ISTE, 2014b, 2014c, 2014d). To accomplish this, ISTE has outlined 14 Essential Conditions that are required "to effectively leverage technology for learning": Shared Vision, Empowered Leaders, Implementation Planning, Consistent and Adequate Funding, Equitable Access, Skilled Personnel, Ongoing Professional Learning, Technical Support, Curriculum Framework, Student-Centred Learning, Assessment and Evaluation, Engaged Communities, Support Policies, and Supportive External Context (2014a, p. 1).

1.3.2 NCTE

When it comes to examining provincial policies and curricula, the National Council of Teachers of English (NCTE) Positions and Guidelines (2013) allow for a critical analysis

to be carried out. The NCTE believes that for students, "the literacy demands of the 21st century have implications for how teachers plan, support, and assess student learning" (2013). The NCTE framework (2013) is also useful in ensuring that the four domains of e-literacy (capability, critical literacy, citizenry, and safety) are aligned with the needs of students who prepare for the challenges of tomorrow's reality.

1.3.3 Aims, Goals, and Objectives

Nel Noddings (2007) cites William Schubert (1986): "Educational theorists usually think of aims, goals, and objectives, in descending order, as statements of educational purpose" (p. 7). I have adapted a diagram from the text (Noddings, 2007) and am presenting it here to be used as a framework for e-literacy scope and structure:

Aims	(increasingly: abstract, general, broad)
↑↓	↑
Goals	|
↑↓	↓
Objectives	(increasingly: concrete, particular, focused)
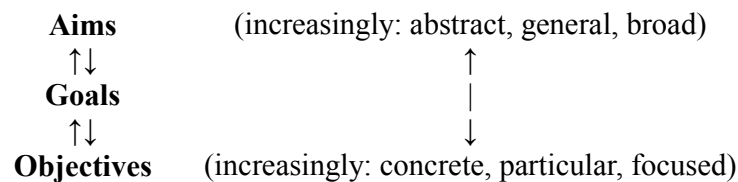
This 'hierarchy of purposes' is a tool useful in illustrating and examining institutional policies and practices at different scales. It also allows one to conceptualize the bidirectional interactions that occur between each level. Noddings (2007) writes that while "the names we use for the categories are not so important… the underlying structure – the nature of the categories themselves and how they are used" are useful and play an important role "in an era of accountability and emphasis on assessment" (p. 8). More on this will be discussed in the capability section of the literature review.

1.4 Outline of Chapters

Chapter 2 reviews literature representing a survey of research on international benchmarks of technology in education, technological and traditional literacies focussing on the four domains, provincial policy and curricula, and other relevant documents.

Chapter 3 describes the research design and methodology used in this study. It details

the selection process for relevant literature and the context for participant input. Data collection and analysis procedures are examined along with the ethical considerations that make up this thesis.

Chapter 4 encapsulates the study's quantitative and qualitative findings. These findings reflect the inquiries directed by the research questions.

Chapter 5 examines the major findings and offers reflections on the reviewed literature and the analyzed data with respect to the research questions. Limitations of the study are discussed here, as well as suggestions and recommendations for future research.

CHAPTER 2

LITERATURE REVIEW

The literature review focuses of the first research question: What are the international trends and benchmarks of e-literacy in education and how do Ontario's K-12 curricula incorporate these benchmarks into 21st century revisions? The review begins with an examination of international trends and policies to better understand what contributes to efficient, effective, and responsible ICT use. Next, the review engages literature on the traditional literacies to explore and understand the domains of *capability*, *critical thinking*, *citizenry*, and *safety*. Further review compares provincial policy and curricular documents to identify the successes, challenges, and opportunities that exist in Ontario's K-12 education system regarding e-literacy theory and practice.

This literature review will help paint a picture of the current educational landscape with regard to ICT use. This step is critical to the research insofar as it offers theoretical and ideological landmarks which will be triangulated with findings from data analysis to be examined in the discussion section. In order to make sense of the successes, challenges, and possibilities found in the lived experiences of teacher candidates, an understanding of contextual factors, influences, and realities must first be exposed.

2.1 Benchmarks of International Policies and Trends

The following documents originate from international organizations and are reviewed to gauge current benchmarks and trends in international policy with respect to research question one.

2.1.1 ISTE

The International Society for Technology in Education (ISTE) (2014a) is a "non-profit organization serving educators and education leaders committed to empowering connected learners in a connected world. ISTE serves more than 100,000 education

stakeholders throughout the world" (n.p.). Their mission is to "empower learners to flourish in a connected world by cultivating a passionate professional learning community, linking educators and partners, leveraging knowledge and expertise, advocating for strategic policies, and continually improving learning and teaching" (ISTE, 2014a). The ISTE Standards are placed first in the literature review because it was often the case that other organizations reviewed in this section had cited materials from them. Three ISTE Standards documents are examined here.

The three Standards focus on how and where innovation needs to take place in order to improve education as educators address 21st century challenges. Such innovation in education "goes far beyond just learning how to use new tools. It requires us to rethink how we teach and learn. And it calls on us to re-engineer our districts, schools and classrooms for the digital age" (ISTE, 2014b). These Standards are focused on outlining the development of key characteristics for administrators (2014b), students (2014c), and teachers (2014d) for success in the digital age, particularly within the contexts of information economies (Aucoin, 2011).

ISTE standards: Administrators (2014b).

In terms of hierarchy, administrators operate within the upper levels of education institutions. This applies to K-12 and post-secondary schools, in boards of education, and particularly in governmental spheres where policy development occurs. In order for administrators to be effective and proactive leaders of education in the digital age, the "ISTE Standards: Administrators" (2014b) describes the following qualities as paramount for success in the 21st century: Visionary leadership, digital age learning culture, excellence in professional practice, systematic improvement, and digital citizenship (pp. 1-2).

The common denominator across these five qualities is the will and ability to integrate technology into their domains to create better learning and teaching possibilities. Of

particular interest is how ISTE also calls for administrators to "model and facilitate" responsible use of technology (2014b, p. 2).

ISTE standards: Students (2014c).

Students are the impetus for constant educational reform. Education must continuously change and adapt to the realities of today and tomorrow, for student success directly influences society and our collective future. As each generation of students graduate from K-12 education, they are expected to assume greater responsibilities and contribute to society in meaningful and mutually beneficial ways. However, effective education is more than knowledge transfer (Freire, 2005); rather it should be aimed at developing the whole child (Noddings, 2005) by cultivating learning processes through relevant and meaningful experiences. The "ISTE Standards: Students" (2014c) list the following six areas as vital for students to be successful in the 21st century global climate: Creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making; digital citizenship; and technology operations and concepts (pp. 1-2).

These standards demonstrate ISTE's recognition that 21st century education institutions need to produce creative, innovative, and critical students who are aware of social issues. These students also need to be able to use technology to communicate, collaborate, and research in ethical ways. A common theme found throughout each of these six points is the need for 21st century students to use technology efficiently and effectively. It is also important to point out that the process of making "informed decisions" and practicing "ethical and legal" behaviour (2014c, pp. 1-2) presupposes knowledge and skills on the responsible use of ICTs, or e-literacy.

ISTE standards: Teachers (2014d).

Conceptually, teachers occupy an area between administrators and students, but

11

realistically, these groups are interdependent. As civil servants, teachers have a duty and responsibility to society; as frontline educators, they are expected to collaborate with administrators, community leaders, parents, and with each other. Most importantly, teachers are to work alongside students to guide and educate them in preparation for the challenges of today and tomorrow. The "ISTE Standards: Teachers" (2014d) document identifies five key facets that contribute to an effective and proactive 21st century teacher: Facilitate and inspire student learning and creativity; design and develop digital age learning experiences and assessments; model digital age work and learning; promote and model digital age citizenship and responsibility; and engage in professional growth and leadership (pp. 1-2).

ISTE believes that teachers need to be architects of 21st century education and that the role of technology plays a crucial part in each of the five items above, demonstrating the emphasis ISTE has placed on technology as a critical educational tool due to its utility and adaptability as a learning resource. According to this document, ISTE believes that teachers must be technologically literate in order to fulfill their task as 21st century educators. Additionally, teachers must understand and exhibit practices of the responsible use of ICTs (2014d, p. 2), pointing to the need for e-literacy theory in teacher education and professional development.

In conclusion, there are several common features that appear in the "ISTE Essential Conditions" (2014a) and the "ISTE Standards" for "Administrators" (2014b), "Students" (2014c) and "Teachers" (2014d) that guide the development of e-literacy theory. First, there is an emphasis on technology, which acknowledges the rise in prominence of ICTs in the 21st century. Second, there is a pressing need for administrators, students, and teachers to be proficient at using technology in responsible ways. Third, the four domains that comprise e-literacy (capability, critical literacy, citizenry, and safety) are all found in each of these documents. Finally, there is an implication that students are more successful when they are

supported by teachers and administrators who are aligned with ISTE standards, and this

success benefits individuals at the micro-level and everyone at the macro-level of society.

This relationship points to the need for education institutions to address 21st century realities

in order to serve their purpose of preparing students for unknown future challenges.

2.1.2 NCTE

The Mission Statement of the National Council of Teachers of English describes their

devotion to "the development of literacy, the use of language to construct personal and public

worlds and to achieve full participation in society, through the learning and teaching of

English and the related arts and sciences of language" (NCTE, 1990). As access to public

education has improved throughout modern history, the demand for literacy has been

increasingly – but never wholly – met. As societies grow and evolve, new technologies

change the way people interact with each other and the world around them. One direct result

of technological advancement is the need for new literacies. Proficiency in multiple literacies

allow individuals greater access to, deeper understanding of, and increased participation in

the world around them. As ICTs become more ubiquitous in 21st century Canadian and global

societies (ITU, 2014), an increasing need for technological literacy is essential for individuals

to benefit from technology.

A definition of 21st century literacies appears in "NCTE Framework for 21st Century

Curriculum and Assessment" (2013):

> …the 21st century demands that the literate person possess a wide range of abilities
>
> and competencies, many literacies. These literacies are multiple, dynamic, and
>
> malleable. As in the past, they are inextricably linked with particular histories, life
>
> possibilities, and social trajectories of individuals and groups. Active, successful
>
> participants in this 21st century global society must be able to
>
> A. Develop proficiency and fluency with the tools of technology;

B. Build intentional cross-cultural connections and relationships with others so to pose and solve problems collaboratively and strengthen independent thought;

C. Design and share information for global communities to meet a variety of purposes;

D. Manage, analyze, and synthesize multiple streams of simultaneous information;

E. Create, critique, analyze, and evaluate multimedia texts;

F. Attend to the ethical responsibilities required by these complex environments. [designations A – F mine] (p. 1)

Based on this definition, NCTE (2013) believes that to be literate in the 21st century, students need to be able to use technology efficiently and effectively, to be independent and critical thinkers, to collaborate and problem-solve in diverse settings, to select from a range of literacies (code-shifting), to multitask across a range of analog and digital media, and to be able to create meaningful artefacts – all while simultaneously navigating the ethically "complex environments" associated with ICTs (p. 1). The literacy requirements outlined in this NCTE document are useful because they help delineate the four domains that comprise e-literacy: capability (designation A, p. 1), critical literacy (designation E, p. 1), citizenry (designation B, p. 1), and safety (designation F, p. 1). These domains are explored later in the literature review.

2.1.3 P21

P21 is the Partnership for 21st Century Learning, founded in 2002 "as a coalition bringing together the business community, education leaders, and policymakers to position 21st century readiness at the center of US K-12 education and to kick-start a national conversation on the importance of 21st century skills for all students" ("P21: Our History," n.d., n.p.). P21's mission statement identifies their dedication to building "collaborative partnerships among education, business, community and government leaders so that all

14

learners acquire the knowledge and skills they need to thrive in a world where change is constant and learning never stops" ("P21: Our Vision and Mission," n.d., n.p.).

The "P21 Framework Definitions" document (P21, 2009) is useful in connecting theory and practice to policy and curriculum. P21 (2009) believes that the "skills, knowledge and expertise students must master to succeed in work and life… [are] a blend of content knowledge, specific skills, expertise and literacies" (p. 1). P21's document (2009) also serves as an international example of the purpose of 21st century K-12 education:

> Within the context of core knowledge instruction, s**tudents must also learn the essential skills for success in today's world, such as critical thinking, problem solving, communication and collaboration** [*emphasis theirs*]…. [C]ombining the entire Framework with the necessary support systems – standards, assessments, curriculum and instruction, professional development and learning environments – students are more engaged in the learning process and graduate better prepared to thrive in today's global economy. (p. 1)

While P21's focus on "today's global economy" should also include that of tomorrow's global economy, an important recognition is made: One purpose of schooling is to equip students with the skills, abilities, and knowledge to be engaged global citizens.

In the P21 Framework image below in *Figure 1*, the arches represent "21st Century Student Outcomes." These outcomes are comprised of "Life and Career Skills," "Learning and Innovation Skills," "Information, Media and Technology Skills," and "Core Subjects and 21st Century Themes" (P21, 2009, p. 1). Within this particular model, the core subjects are English (or language arts), world languages, arts, maths, economics, science, geography, history, and government and civics (P21, 2009, p. 2). These core subjects are supplemented by "21st century interdisciplinary themes" that emphasize "Global Awareness," "Financial, Economic, Business and Entrepreneurial Literacy," and "Civic Literacy" (P21, 2009, p. 2).

21st Century Student Outcomes and Support Systems
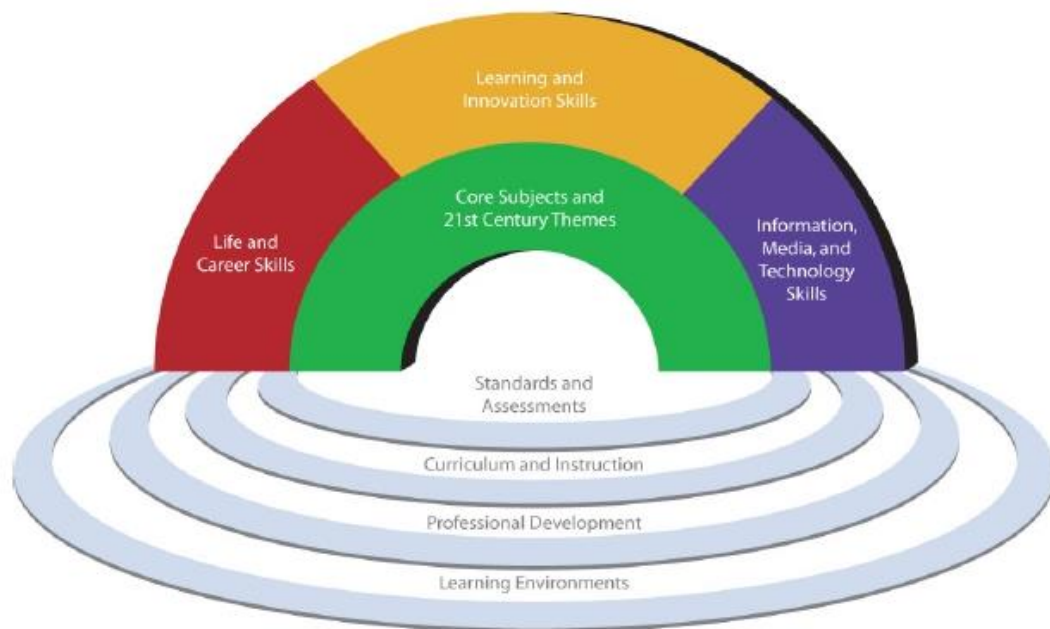
Figure 1. P21 Framework. Adapted from P21 Framework Definitions, by P21, 2009, Retrieved on 30 May 2015, from http://www.p21.org/storage/documents/P21_Framework_Definitions.pdf. Copyright [2009] by The Partnership for 21st Century Skills.

Since e-literacy applies to a wide range of contexts in terms of scope and application, these "21st Century Themes" are important because they help identify the interdisciplinary applications of e-literacy that enable students to become responsible ICT users. Of particular note are the themes of global awareness and civic literacy. "Global Awareness" is explained as "[l]earning from and working collaboratively with individuals representing diverse cultures, religions and lifestyles in a spirit of mutual respect and open dialogue in personal, work, and community contexts," and it is useful in "[u]nderstanding other nations and cultures, including the use of non-English languages" (P21, 2009, p. 2). Students must develop global awareness in order to navigate online environments and compete in an increasingly interconnected world. "Civic Literacy" is defined by P21 (2009) as

"[p]articipating effectively in civic life through knowing how to stay informed and understanding governmental processes" and "[e]xercising the rights and obligations of citizenship at local, [provincial], national and global levels" (p. 2). In addition to "[u]nderstanding the local and global implications of civic decisions" (P21, 2009, p. 2), it is the duty of citizens to contribute to the society that supports them. However, without civic literacy, it is extremely difficult for individuals to make informed decisions as citizens. Harnessing the potential of ICTs, individuals can exercise their rights and participate in a wide range of political acts as e-citizens. This relationship between civic literacy and ICTs has the potential to promote individual agency in political spheres to increase the ability for citizens to exercise their rights and engage in 21st century forms of democracy.

The top-centre section within the arches of P21's Framework (2009) highlights "Learning and Innovation Skills," which demonstrates the vision that the P21 has for the goal of schooling:

> Learning and innovation skills increasingly are being recognized as those that separate students who are prepared for a more and more complex life and work environments in the 21st century, and those who are not. A focus on creativity, critical thinking, communication and collaboration is essential to prepare students for the future. (p. 3)

As opposed to the banking concept of education where knowledge is transferred to students (Freire, 2005), P21 believes that students need to be equipped with skills that promote learning and working together. Through this approach, students are able to problem solve – and even problematize – through collaboration, creativity, and critical thinking.

The ubiquity of technology and the access to vast amounts of information has complicated 21st century learning environments. In "Information, Media and Technology Skills," P21 (2009) recognizes that 21st century society operates within a "technology and

media-suffused environment," which contributes to "1) access to an abundance of information, 2) rapid changes in technology tools, and 3) the ability to collaborate and make individual contributions on an unprecedented scale" (p. 5). In the early stages of the Internet, Web 1.0 features primarily focused on providing consumers with unidirectional access to information. The introduction of Web 2.0 features allowed the Internet to become much more of a two-way information highway. Through the bi-directional platform that Web 2.0 currently offers, the potential for information exchange has increased tremendously, simply because users can both receive information as well as create and contribute content on unprecedented scales. In order to harness that potential for the good of both individuals and society, P21 (2009) believes that "citizens and workers must be able to exhibit a range of functional and critical thinking skills related to information, media and technology" (p. 5). While access to information can be liberating, greater access also means greater responsibility across individual and social contexts. This idea forms the premise of e-literacy in that it is designed to promote the efficient, effective, and responsible use of ICTs.

Within *Figure 1*, the concentric semi-circles underneath the arches comprise the "21st Century Support Systems":

the critical systems necessary to ensure student mastery of 21st century skills. 21st century standards, assessments, curriculum, instruction, professional development and learning environments must be aligned to produce a support system that produces 21st century outcomes for today's students. (P21, 2009, p. 7)

Of particular note are the sections on "21st Century Curriculum and Instruction," "21st Century Development," and "21st Century Learning Environments" (P21, 2009, pp. 8-9). "21st Century Curriculum and Instruction" addresses pedagogy and reflects a synthesized approach to curriculum delivery where students are taught "21st century skills discretely in the context of core subjects and 21st century interdisciplinary themes" (p. 8). It also

"[e]nables innovative learning methods that integrate the use of supportive technologies, inquiry- and problem-based approaches and higher order thinking skills," and should promote "the integration of community resources beyond school walls" (p. 8).

Similarly, the pursuit of "21st Century Professional Development" seeks to amplify "ways teachers can seize opportunities for integrating 21st century skills, tools and teaching strategies into their classroom practice," which contribute to "professional learning communities for teachers that model the kinds of classroom learning that best promotes 21st century skills for students" (P21, 2009, p. 8). That is to say, adopting 21st century approaches to curriculum and instruction is incredibly important for teachers if they want to be effective in 21st century classrooms. It also points to the need for a revolution in the andragogy of teacher education, one that effectively identifies successes, challenges, and opportunities in self-critical, constructive ways. Essentially, P21 believes that teachers need to adapt and integrate ICTs as learning tools into their own curriculum, pointing to the necessity for teacher education institutions to update curricula and practices so that teachers can be effectively prepared for 21st century challenges.

2.2 Traditional and Digital Literacies

Thus far, ISTE, NCTE, and P21 have identified a need for ICT-related literacies to be taught in 21st century education. The difficulty is that many of these groups, including ones examined below, offer their own term and definition of ICT-related literacy. The result is an often confusing and difficult to navigate terrain littered with similar yet distinguished definitions. To alleviate the confusion resulting from this overly complicated landscape, this section engages the idea of literacy from two angles, traditional and digital, to develop a more accessible working definition of ICT-related literacy for two purposes. The first is to develop the theory of e-literacy knowledge and practice, and the second is to better understand context that shapes the first research question: What are the international trends

and benchmarks of e-literacy in education and how do Ontario's K-12 curricula incorporate these benchmarks into 21st century revisions?

Traditional and digital literacies exist within a continuum and are differentiated by their medium. For this thesis, traditional literacy skills are aligned with accessing non-digital sources, such as print texts, and digital literacy skills are leveraged to access digital sources, such as a document in a word processor. Both traditional and digital literacies exist within the highest category of technology described by Kevin Kelly as "the technium" (2009). The technium embodies all human-made constructs – civilization – from artefacts and tools, to languages, laws, and customs. Writing, an invention that allows people to record information in code for example, has appeared in various modes ranging from figures drawn in the sand, to chalk and chalkboards, to dry-erase whiteboards, and more recently, to SMART Boards. Yet all the information contained within these media is meaningless if an audience lacks the technology to decode, understand, and make meaning through literacy skills. To complicate matters, literacy skills required to access non-digital media differ from the literacy skills required for digitally-based media. However, traditional literacies still play a critical role in shaping ICT-based literacy. Due to the new contexts that ICTs bring to 21st century education, this thesis addresses the need for a new approach geared toward developing and understanding digital literacy so that it can be applied to the responsible use of ICTs in digital media and environments.

The difficulty in understanding digital literacy partly stems from its use in academia, because there are many terms that denote ICT-related literacy. For example, the documents examined in this literature review offer the terms "digital literacy," "ICT literacy," and "media literacy" to represent technological literacy. The overt similarities and subtle differences between these digital literacies can be confusing and potentially counter-productive through the obfuscation of relatively simple principles. This thesis presents "e-

literacy" as an easier and more comprehensive definition of ICT-based literacy that can be

integrated into educational policy and practice more efficiently and effectively than its

predecessors. Previous searches found that the word e-literacy is used quite loosely and

sparingly to refer to general digital skills and media consumption ("Welcome to the Journal

of eLiteracy," 2004; "e-literacy." 2007; "The E-Literacy Programme," 2015; Ogwo, 2011).

My intention is to appropriate and redefine the term "e-literacy" so that it incorporates

traditional and digital literacies with the goal of offering a more unified and holistic approach

to the responsible use of ICTs.

On traditional literacies, I had the opportunity as a graduate student to re-envision a

working definition of literacy. Part of the exercise was to recognize how limited some widely

used definitions of literacy really are. The Central Intelligence Agency's *The World Factbook*

(2013d) is published by one of the world's foremost intelligence agencies and is the source

for an immense amount of quantitative and qualitative information on countries and regions.

Despite this comprehensive approach, the definition of literacy used by the CIA is quite

basic: "Unless otherwise specified, all rates are based on the most common definition – the

ability to read and write at a specified age" (Central Intelligence Agency, 2013c). While the

fundamentals of reading and writing are covered, this definition neglects to acknowledge the

skills and abilities required for the critical consumption and creation of media across a range

of modes. Essentially, such a definition fails to address the finer qualities that comprise

literacy and ignores the contexts that require a particular literacy and/or a range of literacies.

Basic and traditional definitions do not capture the full range and depth of literacy,

such as the measure of an individual's proficiency to understand and communicate content,

or the ability of an individual to use a variety of media and modes across a range of contexts.

These definitions also fail to recognize that multiple literacies exist, nor do they acknowledge

the contextual standards (i.e. social, institutional, cultural, etc.) that determine how and which

literacies are applied. In addition to exposing an inherent problem within current uses of the term "literacy," this brief excursion provides deeper insight into the complexities of literacy to better understand the subject of e-literacy in the context of 21st century challenges to bridge traditional literacy and e-literacy theory.

2.2.1 The New Media Consortium

Founded in 1993, The New Media Consortium (NMC) has developed a reputation "as a leader in the inventive application of technology to overcome challenges in teaching, learning, and creative expression" (NMC, n.d., n.p.). The NMC's "A Global Imperative: The Report of the 21st Century Literacy Summit" (2005) document provides an entry point in the literature that differentiates between "traditional notions of language and literacy, which are primarily unimodal and textual" and the multimodal "new form of [digital] communication and self-expression" (p. 1). This "new form" of multimodal digital information creation, retrieval, and dissemination is made possible through ICTs "that allow sophisticated manipulation and creation of images, video, and sound" (NMC, 2005, p. 1), pointing to the need for digital literacies to reflect the range of digital skills required for proficient ICT use.

The opportunities that digital tools and digital sources provide, such as Smart phones, the Internet, and Web 2.0 features, are potentially limitless. Yet for the potential of digital technology to be realized and its inherent dangers mitigated, people must revise literacy skills and apply new strategies directed at using technology efficiently, effectively, and responsibly. Throughout the following documents, three ICT-based literacies are examined in a way that delineates essential domains, which are then distilled into a useful understanding of the role that digital literacy proficiency plays in the overall schematic of e-literacy.

2.2.2 Navigating Digital Literacies

While reviewing the literature for this section, I selected documents based on reputation and their appearance in other documents in this literature review. I also selected

these documents because they represent a range of similarities and differences that occur amongst the skills and abilities associated with technological proficiency. I soon realized that the current situation is a maze of priorities that surround ICT-based literacy like a fog-of-war, contributing to the confusion, misapplication, and unnecessary complication of relevant information. My intention is to offer a roadmap to aid in the navigation of this difficult terrain and ultimately, to provide insight into what ICT-based literacy actually encompasses.

In *21st Century Skills: Learning for Life in Our Times*, Trilling and Fadel (2009) dedicate an entire chapter to "Digital Literacy Skills." In effect, Trilling and Fadel (2009) build upon the P21 Framework examined above to explore the underlying nature of and need for technology-related literacy:

> 21st century students need to acquire the skills to appropriately access, evaluate, use, manage, and add to the wealth of information and media they now have at their thumbs and fingertips. With today's and tomorrow's digital tools, our net generation students will have unprecedented power to amplify their ability to think, learn, communicate, collaborate, and create. Along with all that power comes the need to learn the appropriate skills to handle massive amounts of information, media, and technology. (p. 64)

Building on this need to develop "the appropriate skills," Trilling and Fadel (2009) identify three areas of technological literacy: information, media, and ICT literacies (p. 64).

The first is information literacy, and Trilling and Fadel (2009) believe, "In the 21st century, everyone's level of information literacy and fluency will need to rise. Whether at work, in school, at home, or in the community, there will be increasing demands…" to be efficient, effective, critical, and competent users when accessing information, and to be accurate and creative when using it (p. 64). While Trilling and Fadel (2009) draw directly from the P21 Framework, they delve deeper into critical thinking elements that comprise

information literacy, such as the importance of "[a]ccessing, evaluating, applying, and managing information well, and using information sources appropriately and effectively" (p. 67). The connection between these critical abilities and information literacy occurs when individuals understand "how different types of media are used to communicate messages, how to choose from the many media choices now available, and how to create effective messages in a variety of media…" (pp. 66-67). The key point here is found in processes linked to the self-directed questions of *how*: *how* to use, *how* to choose, and *how* to create using a range of digital media. These self-questions imply deep critical processes that when combined with ICTs, result in what Trilling and Fadel call "informational literacy." The importance of *how*-questions emerges in light of the present state of education: As schools are grappling with updating technology-related educational policy and curriculum, approaches that focus on simply introducing ICTs only address issues concerning *what* in terms of technology. Yet, simply providing technology is not enough. An equally – if not more important – factor in preparing students for life in society is teaching them *how* to use technology well, an approach that incorporates the critical thinking skills that Trilling and Fadel identify as operating at the heart of information literacy.

The second literacy identified with digital literacy is media literacy. The Center for Media Literacy (CML) is an international organization "that provides leadership, public education, professional development and educational resources… to help citizens, especially the young, develop critical thinking and media production skills needed to live fully in the 21st century media culture" (CML, n.d., n.p.). From a "21st century approach to education," CML (2011) defines media literacy as "a framework to access, analyze, evaluate, create and participate with messages in a variety of forms…," to build "an understanding of the role of media in society as well as essential skills of inquiry and self-expression necessary for citizens of a democracy" (n.p.).

24

Trilling and Fadel (2009) cite CML in their work and further expand on this

definition: "21st century students need to understand how to best apply the media resources

available for learning, and to use media creation tools to create compelling and effective

communication products such as videos, audio podcasts, and Web sites" (p. 67). Here, the

common factor is the need for critical thinking skills to be applied to all forms of media. In

short, media literacy calls attention to the important idea that literacies traditionally

associated with analogue media still apply to digital forms. Here, the difference is that

traditional literacies need to be adapted and applied in order to critically address contextual

requirements of digital media.

The third and final literacy for this section is ICT literacy. The goal of Educational

Testing Services (ETS) (2015) is "to advance quality and equity in education for all people

worldwide… [and] to provide innovative and meaningful measurement solutions that

improve teaching and learning, expand educational opportunities, and inform policy" (n.p.).

ETS (2002) defines ICT literacy as "using digital tools, and/or networks to access, manage,

integrate, evaluate, and create information in order to function in a knowledge society" (p. 2).

In addition to this definition, there are "five components" that represent the skills and

knowledge required for ICT literacy: Access, manage, integrate, evaluate, and create (ETS,

2002, pp. 2-3).

The components access, evaluate, and create are of particular note due to their

relation to the specific domains of e-literacy, capability and critical literacy. "Access" implies

two prerequisites, (a) the actual presence of technology, and (b) specific knowledge and skills

to use a range of ICTs. This idea will be revisited and developed when the domain of

capability is examined in the following section. "Evaluate" points to the recurring element of

critical thinking skills, which are required for individuals to make effective decisions and be

responsible producers and consumers of content. The emphasis on "creation" in ICT literacy

is also worth mentioning, because this is a particular area of divergence from the literacies

previously examined in this section. While creation is implied in information literacy and

media literacy, the purpose of ICT literacy is more closely aligned with producing content.

The act of creation represents the peak of higher-order thinking skills identified in the revised

version of Bloom's Taxonomy (Krathwohl, 2002), but students cannot always be successful

creators without being proficient in the other skills that support creative processes.

Reflecting back upon the literature reviewed thus far, we may ascertain that the

international groups ICTE, NCTE, P21, The New Media Consortium, and Educational

Testing Services have all made it clear that skills and abilities associated with information

literacy, media literacy, and ICT literacy are necessary for 21st century education. It must be

noted that within each of the documents reviewed, thematic patterns across each of the ICT-

related literacies point to the need for critical thinking as well as the responsible consumption

and creation of media.

When it comes to technology-related literacies, however, it is confusing to have three

or more distinct literacies that overlap in the majority of content and differ only slightly. The

literature review has identified a current trend of competing definitions that contribute to a

rather congested approach to technology-related literacy. As a solution, this thesis offers a

new and alternative approach that selects the common themes and unique elements from

literature reviewed and distills them into a theory I call "e-literacy."

2.3 The Four Domains of e-Literacy

Up to this point, the literature review has addressed the first research question by

exploring internationally-sourced trends and benchmarks, identified the increasing state of

technological ubiquity in 21st century society that calls for ICT-based literacy, and surveyed a

range of current ICT-based literacy definitions. As a theory of knowledge and practice, e-

literacy requires specific skills and abilities to be leveraged at the outcome of efficient,

effective, and responsible ICT use. The previous section demonstrated the need for digital

literacies such as information literacy, media literacy, and ICT literacy in 21st century

contexts. However, e-literacy is more than just a streamlined approach to ICT-based literacy:

It requires useful, ethical, and protective elements that promote effective practices. The

following section delves into an examination of the four domains of e-literacy that promote

these practices: *capability*, *critical literacy*, *citizenry*, and *safety*.

2.3.1 Capability

Capability is first among the four domains because it represents the operational facet

that individuals and societies require to interface with and actualize the potential of

technology. Cultivating capability in individuals develops the potential for society to innovate

because "the generation of wealth, the exercise of power, and the creation of cultural codes

[come] to depend on the technological capacity of societies and individuals, with information

technologies as the core of this capacity" (Castells, 1998, as cited in Hilbert, 2009, p. 756).

For e-literacy, the capability domain describes *what* knowledge and skills are necessary to

use for a wide range of technologies, as well as *how* to use them effectively, efficiently, and

responsibly. If people are not capable, they will not be as effective or efficient and technology

will not be able to serve its purpose as a tool for information exchange and communication.

The literature in this section was selected for its relevancy to Canadian contexts and

examines the following three themes: building a foundation for capability, Canada's

infrastructure at the individual and societal levels and how they can contribute to digital

divides, and access as a prerequisite for use. These themes are relevant to e-literacy in that

infrastructure and capability represent the basic needs that must be met in order for a

technologically literate society to function.

The term capability implies functional knowledge. As ICTs become more and more

embedded in our everyday activities, the demand for capability increases at home, at schools,

and in the workplace. Capable use of ICTs is determined by (a) access to technology, (b) knowledge of technology, and (c) the practical application of this knowledge. Whereas knowledge of technology is encountered through social learning, and application implies the presence of technology, access to technology is largely determined by geo-temporal location and socio-economic status (Hilbert, 2009, p. 758). Geo-temporal location signifies the space and time requisites that determine access to technological infrastructure (i.e. energy, networks, etc.), while socio-economic status identifies the need for resources (i.e. money, retailers, etc.) that make acquiring ICT devices and services possible. In terms of large-scale infrastructure, Caroline Haythornthwaite and Richard Andrews (2011) state that many people assume ICT infrastructure in the United States (US) is highly interconnected; however, "the vast geographical distances often belie that image as carriers need time and incentive to install cell phone towers, broadband and wireless facilities in remote regions" (p. 200).

Compared to the "vast geographical distances" of the US, Canada's situation is similar. However, when population and population density are factored in for the two countries, an even more difficult challenge to Canadian infrastructure surfaces. To put the two countries into perspective, the total area of Canada is 9,984,670 km² (Statistics Canada, 2005) and the total area of the US is 9,826,675 km² (Central Intelligence Agency, 2013a), making for a difference of only 157,995 km². In terms of population for the year 2014, the US has an estimated 318,892,103 people (Central Intelligence Agency, 2013b), while Canada has approximately 35,540,400 people (Statistics Canada, 2014), indicating a difference of approximately 283,351,703 people. Even though the two countries differ only slightly in total area, the US has almost nine times the population, resulting in a population density that is much higher in the US than it is in Canada. Unlike countries with a small total area and a high population, such as the UK or Japan (Central Intelligence Agency, 2014a, 2013b), the US and Canada must overcome particular contextual challenges when it comes to

developing, providing, and maintaining ICT-based infrastructure. The challenges described by Haythornthwaite and Andrews (2011) that face the US due to geography are further magnified by Canada's demographic reality: Despite being required to span massive distances and service populations of lower density than its American neighbour, Canada's ICT infrastructure is supported by fewer taxpayers and fewer total consumers. At the macro-level, Canada's reality is one that requires more resources, such as time and money, to establish, maintain, and upgrade ICT-focused infrastructure. Increased costs coupled with vast distances and low population means that certain portions of the Canadian population are threatened with being on the wrong side of the digital divide simply due to the geo-temporal factors of where they live and when, if ever, the infrastructure reaches them.

Geo-temporal and socio-economic factors also challenge Canadians' use of and access to ICT infrastructure at the individual level. Since "[a]ccess at home follows socio-economic lines…" (Haythornthwaite & Andrews, 2011, p. 184), individuals must not only be in the right place at the right time for infrastructure to be available, they also need to have enough financial resources to acquire and maintain their technological needs. Similarly, school boards wage a constant economic battle to equip schools with relevant technological infrastructure, devices, and services based on revenue and budgetary constraints. Haythornthwaite and Andrews (2011) describe how the financial demands associated with access are further complicated by the need for "current technology landscapes [to] include a wide range of technology" to be maintained and upgraded:

> Being up to date with digital technology is now more complicated than owning a computer and using it to find resources. What has to be adopted to remain current – or operational – is more varied. Being on the right side of the divide becomes a process of both continuous adoption *and* continuous discontinuance. (p. 187)

Once homes and schools are equipped with technological infrastructure, devices, and

services, they must stay relatively up-to-date or risk falling behind and being on the wrong side of the digital divide. Homes and schools also need to continuously and consistently retire obsolete technologies or risk wasting precious resources that could otherwise be used on more beneficial learning tools. For this reason, the ISTE's (2014a) "Essential Conditions" framework calls for "[c]onsistent and [a]dequate funding… to support technology infrastructure, personnel, digital resources, and staff development" (p. 1).

Once homes and schools have up-to-date, useful, and relevant *access*, the technology is then available for *use*. Haythornthwaite and Andrews (2011) distinguish *access* from *use*, "in that it is one thing to have *access* to a networked computer, and another to *use* that privilege to good and full effect" [emphasis mine] (p. 60). In other words, access is required in order for people to have the opportunity to use technology responsibly. Without access, individuals, communities, societies, and even nations will find themselves on the wrong side of the digital divide. The term "digital divide" is currently a hotly debated subject in literature and research on ICT access and adoption. While an in-depth review of this term is outside the scope of this thesis, a brief incursion is necessary to understand how access affects capability and, by extension, e-literacy theory and practice.

Hilbert (2009) states that the digital divide "is usually defined as the divide between those included and those excluded from the digital age…" (p. 758). This inclusion/exclusion dichotomy describes people and settings that have or do not have access to technology, but it is insufficient as it leaves "lots of room for interpretation" (p. 758). In order to get a deeper understanding of the digital divide, factors such as "the group of users," the kind of technology under consideration," and "the stage of adoption" (p.758) must be considered. Haythornthwaite and Andrews (2011) draw from research by Lenhart and Horrigan (2003) and Warschauer (2003) to offer an alternative term that captures more of the nuances touched on by Hilbert, wherein they call for the digital divide to be "more generally recognized as a

digital spectrum of access and use" (p. 183). Engaging the topic of the digital divide as a spectrum is more useful in acknowledging the range of factors that affect digital access and thus, aid in determining potential capability.

As the first of the four domains of e-literacy, capability can lead to the responsible use of ICTs as long as access is available to users, the users receive instruction on efficient and effective knowledge and practices through some form of education, and that knowledge is applied "to good and full effect" (Haythornthwaite & Andrews, 2011, p. 60). Capability comes first among the four domains because without it, all the knowledge of critical literacy, citizenry skills, and safe practices cannot be actualized.

2.3.2 Critical Literacy

And surely, once our city gets a good start, it will go on growing in a cycle. Good education and upbringing, when they are preserved, produce good natures, and useful natures, who are in turn well educated, grow up even better than their predecessors, both in their offspring and in other respects…

–Plato (1997b, p. 1056)

Once individuals have attained capability through access to and knowledge of ICTs, their practices must then be reinforced through the development of critical literacy skills. Critical literacy promotes the responsible consumption and production of media and requires a habitual process of application and reflection. Critical literacy skills are not spontaneously developed, so they must be learned by people in social settings for individuals and society to benefit from them. Since critical literacy is not at 100% rate in our population, it cannot be expected that all children in all parts of the province will acquire these skills through a natural process. Thus, if society is to consist of critically aware individuals, educational institutions must assume responsibility for teaching critical literacy skills.

In this section, literature was selected based on historical, geographical, cultural, and

social significance to e-literacy theory and practice and examines the following themes: The importance of freedom of information and the dangers of censorship, the need for critical consciousness to thwart oppressive regimes, and the need for critical pedagogies and andragogies to cultivate a conscientious society. These themes are as important to e-literacy as they are to literacy, and they are equally relevant as well. The only difference is that e-literacy focuses on the ICT-based relationship that exists between users and the production and consumption of media, pointing to the need for traditional elements of critical literacy to be applied in new ways to promote the responsible use of ICTs.

Allan Luke does not represent the entire field of critical literacy, but his work was selected for three reasons: First, his work is developed within educational contexts, second, he is a Canadian scholar, and third, his work reflects theories aligned with e-literacy. He believes "the term *critical literacy* refers to the use of the technologies of print and other media of communication to analyze, critique, and transform the norms, rule systems, and practices governing the social fields of everyday life" (Luke, 2004, as cited in Luke, 2012, p. 5). For Luke, critical literacy should be applied to all types of media form and content in the selection, consumption, and production of information for communicative purposes to improve social contexts. A second purpose of critical literacy is to determine the veracity of media form and content. Luke describes truth verification as a process of inquiry centred on questions and reflections constructed by an individual: "What is 'truth'? How is it presented and represented, by whom, and in whose interests? Who should have access to which images and words, texts, and discourses? For what purposes?" (Luke, 2012, p. 4). These self-directed questions, along with others, aid individuals in developing habits that promote critical thinking processes which, in turn, contribute to critical literacy. As Luke demonstrates, these self-questions operate on the foundational interrogatives: *who*, *what*, *where*, *when*, *why*, and *how* – which from this point will be referred to as 5WH. As the cornerstone of critical inquiry

32

and truth verification, the self-questions represented by 5WH are essential tools for equipping students with the potential for critical literacy.

Luke (2012) also describes the purpose of critical literacy with regard (a) to access to information, and (b) power hierarchies. Citing several works that often comprise secondary school literature canons such as *Brave New World* (Huxley, 1932), *1984* (Orwell, 1949), and *Fahrenheit 451* (Bradbury, 1962), Luke (2012) believes that these works are useful in promoting critical literacy because they "remind us that civil society, human relationships, and freedom are dependent on the free flows of knowledge," and alongside of other texts like them, "These works teach the centrality of memory and history, the danger of autocratic control of information, and the moral imperative of critique" (p. 5). As Canada is a democratic society that currently faces the realities entwined with 21st century technology, Canadians must be equipped with the critical abilities that allow us to promote and maintain the "free flows of knowledge," as well as thwart the dangers to freedom that manifest through the "autocratic control of information" (p. 5). Luke (2012) also describes the constant battle that exists between the freedom of and the restriction of information, where individual rights and freedoms are ultimately at stake:

> Struggles over power are, indeed, struggles over the control of information and interpretation. Whenever textual access, critique, and interpretation are closed down, whether via corporate or state or religious control of the press, of the Internet, of server access, of the archive of knowledge – from the first libraries of Alexandria to Google – human agency, self-determination, and freedom are put at risk. (p. 5)

As information "access, critique, and interpretation" continues to expand into ICT-based environments, e-literacy becomes an increasingly relevant approach to equipping individuals with techniques and practices geared toward the responsible use of ICTs.

The issues revolving around "human agency, self-determination, and freedom"

33

described by Luke are not limited to 20th and 21st century contexts. John Milton's "Areopagitica," is a 17th century polemical tract that presents these issues at the centre of a larger debate on the dangers of censorship and the importance of free access to information. This text was selected to demonstrate the dynamic between freedom of information and censorship. From Milton's (2008) perspective, the censorship of media leads to "the discouragement of all learning, and the stop of truth," by deskilling individuals, atrophying our ways of knowing, and potentially preventing any further discovery (p. 239). Milton argues that censorship is anti-intellectual because it allows gate-keepers to filter media on the pretense that objectionable content will corrupt an audience. One critical approach to this notion is that if people are so corruptible, who can act as censor without falling prey to the inherent negative influences of the material? More importantly, once all objectionable material is removed, how can people learn about and/or avoid *bad* things without experiencing them first hand (Milton, 2008, p. 248)? Even though Milton posited these questions centuries ago, they have direct relevance when it comes to addressing access to information in today's schools. This issue is further examined in the section on Safety, as well as in the chapter dedicated to Findings. For now, Milton (2008) addresses the second question by drawing from a wide range of classical and Biblical literature to describe the interdependent relationship between good and evil, concluding that rational beings require skills of discernment to distinguish between the two (p. 247). This ability of discernment is first, a facet of wisdom developed out of knowledge and experience, and second, implies the use of critical skills to determine truth (Milton, 2008, p. 247). Since access to information combined with critical literacy opens the potential for truth to be pursued, censorship is thus diametrically opposed to the freedom of individuals and the education of society by undermining critical inquiry and creating the potential for corporate, state, religious, or social institutions to establish oppressive regimes.

Writing about 20th century models of education, Paulo Freire (2005) examines how critical literacy represents a tool of liberation from oppressive institutions. His work was selected because of its relevancy to e-literacy insofar as the description he provides on the root causes and consequences of an oppressed population due to socio-economic factors and unequal/inequitable education systems. I foresee similar potential for disaster in Canada if the gentrification of education allows for e-literacy to be explicitly taught to some, while being simultaneously withheld from others.

In *Pedagogy of the Oppressed*, Freire (2005) describes the 20th century model as "the banking concept of education, [where] knowledge is a gift bestowed by those who consider themselves knowledgeable upon those whom they consider to know nothing" (p. 72). To Freire, this education system has become fixated on the idea that students are "containers" and "receptacles" who should be "filled" with knowledge from a person in the position of authority – teachers and administrators (p. 72). The result is an education institution that promotes "an ideology of oppression," projects "an absolute ignorance onto others," and "negates education and knowledge as processes of inquiry" (p. 72). The true danger of the banking concept, writes Freire (2005), is its pernicious and tenacious tendency to reduce and prevent critical skills from being developed:

> The more students work at storing the deposits entrusted to them, the less they develop the critical consciousness which would result from their intervention in the world as transformers of that world. The more completely they accept the passive role imposed on them, the more they tend simply to adapt to the world as it is and to the fragmented view of reality deposited in them. (p. 73)

The passive role thrust upon students in banking concepts of education prevent them from humanistic pursuits on two fronts: (a) as actors in their own learning processes, and (b) as agents of change within their own contexts. "Education as the practice of freedom – as

35

opposed to the practice of domination – denies that man is abstract, isolated, independent, and unattached to the world; it also denies that the world exists as a reality apart from people (Freire, 2005, p. 81). Freire believes that education as the practice of freedom also promotes "authentic reflection" where people engage consciousness within themselves and in the world around them as simultaneous and interdependent realities.

The practice of information domination and an under-emphasis on critical awareness in the banking concept do more than undermine the liberating potential of critical literacy, it results in an even more dangerous reality through its self-perpetuating nature. Freire (2005) recognizes, "The capability of banking education to minimize or annul the students' creative power and to stimulate their credulity serves the interests of the oppressors, who care neither to have the world revealed nor to see it transformed" (p. 73). These "oppressors" then "use their 'humanitarianism' to preserve a profitable situation" (p. 73) in a relationship where the balance of power clearly has shifted in favour of those who benefit from the oppressed. The resulting imbalanced power hierarchy is difficult to rectify because the oppressors have no interest in giving up their power position, and the oppressed peoples do not possess the critical abilities and resources to change their situation. Freire believes that the solution to this imbalance of power is "to transform the [banking concept]" to "undermine the oppressors' purposes" through "*conscientização*" (2005, p. 74). *Conscientização*, or critical consciousness, is an in-depth understanding of the world gained through observation of and exposure to social and political contradictions. Critical consciousness can illuminate and provide an understanding of the oppressive elements in one's life; it can also lead to action aimed at changing the balance of power to a more equitable state. Thus, critical literacy is the tool for which "the quest for mutual humanization" can be sought out by learners and educators – by people – through the process of balancing power hierarchies to bring about liberation from oppressive concepts of education (Freire, 2005, p. 75). It is important,

however, to remember that simply possessing critical literacy is not enough to achieve

freedom from anti-intellectual (Milton, 2008) and oppressive elements (Freire, 2005) in

education. Freire (2005) aptly points out, "Liberation is a praxis: the action and reflection of

men and women upon their world in order to transform it" (p. 79). In other words, liberation

is a process of humanization, and that liberation comes through the habituated practical

application of critical thinking skills.

Freire (2005) states that critical literacy in education requires more than simply

depositing information in the minds of students; it demands "problem-posing education"

focused on "the problems of human beings in their relations to the world" (p. 79). Freire

(2005) believes that problem-posing education is the key to the development of critical

literacy skills because (a) it "involves a constant unveiling of reality" which promotes "the

emergence of consciousness and *critical intervention* in reality" (p. 81); (b) it "regards

dialogue as indispensable to the act of cognition which unveils reality (p. 83); and (c) it

"bases itself on creativity and stimulates true reflection and action upon reality, thereby

responding to the vocation of persons as beings who are authentic only when engaged in

inquiry and creative transformation" (p. 84). For educators, problem-posing is an act of

creation (Freire, 2005, p. 81) and for students, problem-posing education allows them to

"develop their power to perceive critically *the way they exist* in the world *with which* and *in*

which they find themselves; they come to see the world not as a static reality, but as a reality

in process, in transformation," and in becoming (Freire, 2005, pp. 83-84).

Building on Freire's examination of how education systems can become oppressive

without the checks and balances offered by critical pedagogies, Henry Giroux (2001)

addresses the idea of pedagogy as a defining tool for developing critical literacy skills.

Giroux (2001) views pedagogy thus:

a referent for analyzing how knowledge, values, desire and social relations are

constructed, taken up, and implicated in relations of power in the interaction among

cultural texts, institutional forms, authorities, and audiences… [and] redefines the

implications of a critical pedagogy as part of a broader ethical and political project

wedded to furthering social and economic justice and making multicultural

democracy operational. (p. 3)

It is important to note that Giroux's use of the term "multicultural" is limiting. For education

in Canada, a more critical term, "anti-racist," is often used to better describe the need for

power relations to be examined. George J. S. Dei (2001) writes, "Anti-racism unlike

multicultural education focusses on the pointed notion of difference as opposed to diversity

and its slippage to sameness. Questions of power and power relations are at the fore of anti-

racist education" (p. 150). Dei (2001) goes on to state, "Uncritical multicultural education

will emphasize issues that lead to better intergroup communication, enhance co-operation and

tolerance among people of diverse backgrounds, and foster respect for social difference at the

expense of addressing relations of power" (p. 150). At the societal level, critical pedagogies,

including anti-racist education, are the driving forces that seek progressive social, political,

and economic change. At the individual level, anti-racist education equips people with the

critical skills and abilities to understand and engage power relations to challenge oppressive

regimes and institutions.

Critical pedagogies also offer ways of preparing students for life in the future in ways

that benefit both individuals and society as a whole. On this front, educators have the

responsibility to level power hierarchies within the classroom, and to create authentic

learning experiences that reflect real-world situations and highlight the social imperatives

that are in-line with democratic values. Educators need to promote and practice critical

reflection, since "critical pedagogy is concerned about the articulation of knowledge to social

effects and succeeds to the degree in which educators encourage critical reflection and moral

and civic agency rather than simply mold it" (Giroux, 2001, p. 19). This applies to teacher education as well, where adults are instructing other adults in andragogical settings. In order for critical pedagogy and andragogy to occur, educators must be self-critical by being "attentive to the ethical dimensions of their own practice" (Giroux, 2001, p. 19). Giroux (2001) warns,

> Taking seriously the relationship among power, politics, agency, and pedagogy might enable critical educators to connect meaning and pleasure with commitment and passion, as part of a broader strategy of self and social formation. Refusing to treat pedagogy as a moral and political practice does more than undermine the opportunity for educators to explore its transformative possibilities; it also means that they often have no language for recognizing the abuses often exercised under the rubric of teaching. (p. 8)

Here, Giroux succinctly identifies the responsibility that educators have in terms of promoting critical literacy through pedagogy and andragogy to improve student ability and provide opportunities for connections to be made between learning, self-awareness, self-determination, and self-improvement.

Critical pedagogy also provides an entry point for educators to be self-aware and self-critical about their own practices, especially since most educators today have experienced some form of the banking concept of education themselves. I believe educators who are not critical of their own practices have an increased chance of replicating oppressive and dominating theories and practices encountered as K-12 students and as teachers in training. The potential result is the continuance of banking concepts of education that promote unbalanced hierarchies of power and misguided aims, goals, and objectives (Noddings, 2007) of education.

To counter oppressive forms of education, critical pedagogies possess ethical power

to affect the real-world by enabling individuals to become agents of change. The opposition faced by agents of change, however, is captured in the words of Simone de Beauvoir: "the interests of the oppressors lie in 'changing the consciousness of the oppressed, not the situation which oppresses them'" (as cited in Freire, 2005, p. 74). That is to say, those who are in power seek to subvert dialogue and divert attention away from issues that threaten their position of power, thereby maintaining hegemony over the oppressed. Giroux (2009) reflects similar sentiment in the modern context of oppressive regimes, noting, "the productive character of pedagogy as a moral and political practice is routinely dismissed as the imposition of bias, derided as utopian fantasy, renounced as an obstacle to learning, or relegated to a grab bag of depoliticized methods that define pedagogy largely in technical and instrumental terms" (p. 9). Such anti-critical literacy arguments pave the way for institutions to reinstate banking concept models of education into everyday practices.

Ultimately, threats to progressive and democratic education, such as those represented by oppressive models, are best engaged and overcome through critical pedagogies and andragogies. Critical literacy curricula should be interdisciplinary in nature and "educators [should] afford students more diverse opportunities to understand and experience how politics, power, commitment, and responsibility work on and through them, both within and outside of schools" (Giroux, 2001, p. 25). Learning within the context of critical pedagogies and 21st century technologies, students are able to develop skills that "enable [them] to locate themselves within an interrelated confluence of ideological and material forces as critical agents," so that they "can both influence such forces and simultaneously be held responsible for their own views and actions" (Giroux, 2001, p. 25). Due to the proliferation of technology, more so now than ever before, students have a greater platform on which they can express their views and actions. It is for this reason that critical literacy education is required to cultivate knowledge and application of responsible practices in the 21st century.

In fact, critical literacy is so important that each of the international groups examined in the literature review make explicit calls for it to be applied to technology in 21st century education. The ISTE calls for critical literacy in the document geared for students (2014c). Interestingly, the ISTE fails to mention critical literacy or pedagogy for administrators (2014b) and teachers (2014d), opting instead to emphasize the importance of life-long learning and modelling responsible practices. These responsible practices imply critical pedagogies, but fall short of naming them. The NCTE (2013) incorporates elements of critical literacy into its definition of 21st century literacies, as well as providing guiding questions that will aid in the assessment of the development of critical literacy skills in students. In P21's (2009) "Learning and Innovation Skills" section, "Critical Thinking and Problem Solving" is an integral part of its educational mandate. P21 (2009) also believes that to be prepared for 21st century challenges, students must be able to "reason effectively" within contexts, "use systems thinking" to understand "how parts of a whole interact with each other," "make judgments and decisions" through higher order thinking skills, and "solve problems [in] conventional and innovative ways" (p. 4).

2.3.3 Citizenry

...what we have in mind is education from childhood in virtue, a training which produces a keen desire to become a perfect citizen who knows how to rule and how to be ruled as justice demands... [A]s a rule, [people] with a correct education become good, and nowhere in the world should education be despised, for when combined with great virtue, it is an asset of incalculable value. If it ever becomes corrupt, but can be put right again, this is a lifelong task which everyone should undertake to the limit of [their] strength.

–Plato (1997a, pp. 1337-1338)

As technology promotes greater interconnectivity and interaction between people

41

across the globe, the resulting knowledge societies have produced a form of global citizenry, which has enabled increased individual agency. Writing about Canadian policy in the 21st century, Robert C. Aucoin (2011) defines knowledge societies as "any knowledge-based communities" (p. 2). He expands this definition by stating, "What is new in the ICT era is the way in which knowledge societies are no longer encumbered by geography or time in the exchange of knowledge" (Aucoin, 2011, p. 2). The agency made possible through knowledge societies can be harnessed and channeled through participation in digital society. Maarit Mäkinen's work was selected for this review because of the relevancy that "digital empowerment" has with respect to e-literacy. Mäkinen (2006) describes digital empowerment as a two-way participatory "*enabling process*" that "proceeds like a spiral from the prerequisites to the improvements in skills and knowledge, and then to the consequences, which are empowering for the community and its members" (p. 391). The "prerequisites" and "skills and knowledge" that lead to the empowerment of communities and individuals are reflected in the domains of capability and critical literacy examined above. When leveraged at civic-related outcomes, capability and critical literacy contribute to the "possibilities of participation and influence grow[th] in an empowerment process with increasing inclusion" (Mäkinen, 2006, p. 393).

However, one obstacle to this pursuit of empowerment is the toxic rhetoric used by "information society programs" that provide "a very mechanistic role model for citizens," labelling individuals as "users, customers, consumers and citizens, sometimes e-citizens" (Mäkinen, 2006, p. 382), effectively ignoring the potential for individuals to contribute in meaningful ways. Mäkinen (2006) recognizes that "[t]he common function for all these roles,… is to *adapt* and *receive*" (p. 382). One problem here is that in adaptive roles, "people are considered users of infrastructure and contents, and they are presumed to have user skills, but not too much participatory, planning or criticizing ability" (p. 382). Mäkinen (2006)

concludes that even though an individual may operate within this hierarchy, "s/he still remains in the role of user, not creator" (p. 382). Another problem, this one harkening back to Freire's depiction of banking concept where students are seen as receptacles, has to do with labelling individuals and the projection of people as "receivers" who *receive* their role by buying, using, consuming and accepting things offered from the top-down. The public administration or media do not seem to recognize people in initiating and active roles, or as cooperators," resulting in a relationship where "[c]itizens are patronized, informed, and offered things in a one-way manner" (Mäkinen, 2006, p. 382). Mäkinen (2006) reaches the conclusion that "citizens as receivers do not act as having complete control over their lives" (p. 382). Thus, citizenship is more than just participating in political events and consumerism – it implies a sense of belonging, responsibility, and agency.

Since citizenship through active participation "requires skills and competence in order to have an influential role in society," Mäkinen (2006) proposes the "*role of participant subject* as an aim of citizenship, which includes a feeling of controlling one's life and having enough competence to collaborate significantly to make changes in society" (p. 383). In terms of a "participant subject," a little unpacking is required. First, "participant" implies a contributing member, while "subject" implies not just a hierarchy within a system, but also a place and an identity for participants in that system. Mäkinen (2006) states, "For participatory democracy, people should be able to act as subjects (power with), not only as receiving objects (power over)" (p. 387). But if an "aim of citizenship" is developing participant subjects within democracies as Mäkinen claims, who or what is responsible for this process of cultivation? The answer lies in an exploration of the purpose of education.

This next section examines literature that focuses on citizenship in education by exploring democratic ideals, the aims of schooling, and the need for technologically literate citizens in the 21st century. In the same way that current aims of democratic citizenry promote

responsible practices in traditional fora, the domain of citizenry within e-literacy serves to promote responsible practices, collaboration, and agency in online environments. Citizenry also provides individuals with increased potential for personal and communal empowerment, since "[g]rowing towards participatory citizenship is not only an individualistic process, where a person learns useful skills for himself/herself, but also an interactive learning process in the context of one's environment and community" (Mäkinen, 2006, pp. 384-385).

Sherri H. Culver and Thomas Jacobson (2012) explain, "Democratic governance requires both an informed citizenry and a citizenry free to express opinions" (p. 74). However, expression does not achieve its potential unless it has depth as well as range: "Deep discussion among citizens about their specific needs and interests is of paramount importance if an active citizenry is desired. This balance of theory and practice is a core component of Paolo Freire's concept of 'praxis' or informed action" (Culver & Jacobson, 2012, p. 74). As was explored in the critical literacy section above, Freire (2005) believes that this practical application of emancipatory knowledge can only happen in freedom-based education, as opposed to within oppressive models, such as the banking concept of education (p. 81).

Values and responsibilities of citizenry in democratic and free nations is inextricably and intrinsically linked to public education. On this subject, Nel Noddings (2005) delves into an examination of the purpose of schooling by referencing two historical American documents. First, she cites Thomas Jefferson's "objects of primary education" from the 1818 *Report of the Commissioners for the University of Virginia*, which include "morals, understanding of one's duties to neighbours and country, knowledge of rights, and intelligence and faithfulness in social relations" (as cited in Noddings, 2005, p. 10). The second citation draws from the National Education Association's 1918 report, *Cardinal Principles of Secondary Education*, wherein "(1) health; (2) command of the fundamental processes, (3) worthy home membership, (4) vocation, (5) citizenship, (6) worthy use of

leisure, and (7) ethical character," are distinguished as "aims of education" (as cited in

Noddings, 2005, p. 10). Both of these historic documents identify elements of citizenry as

crucial themes of public education.

From a Canadian perspective, J. H. Putman (1912) writes about the history of

education in Upper Canada based on the work published by Egerton Ryerson in 1847. On the

subject of education, Putman recognizes public schooling as "an agency to promote good

citizenship" (ch. V), referring to Ryerson's definition of education as "not the mere

acquisition of certain branches of knowledge, but that instruction and discipline which

qualify and dispose the subjects of it for their appropriate duties and employments of life

(Ryerson, 1847, as cited in Putman, 1912, ch. V). To Ryerson, public education should go

beyond the teaching of subjects to include education on vocation and civic duty to prepare

students to be "members of the civil community in which they live" (Ryerson, 1847, as cited

in Putman, 1912, ch. V). On universal and democratic education, Putman (1912) believes it

should "be adapted to the needs of the country" (ch. V). Putman also notes the 1847 report,

wherein it states that universal education "should be provided for all, and taught to all,"

including "the most needy" individuals in society (Ryerson, 1847, as cited in Putman, 1912,

ch. V). More recently, Bernie Froese-Germain (2013) of the Canadian Teachers' Federation

draws from Ryerson's work:

> As beneficiaries of the public education system, Ryerson recognized, as should we
>
> all, that education is much more than the transfer of basic numeracy and literacy skills
>
> from teacher to student – an important goal of public education in a democracy is to
>
> prepare all students for active participation in society. (p. 1)

From these examples of early American and Canadian educational policy, education based on

democratic values is intended to provide access to education for all and to produce

knowledgeable citizens who can contribute to society in meaningful and useful ways.

However, the spirit of democratic education for all can be a force of oppression when it is instituted uncritically. For example, Thomas Jefferson's "objects of primary education" include "knowledge of rights" (as cited in Noddings, 2005, p. 10), which while ideologically sound, is undermined by Jefferson's personal status as a slave owner who hypocritically claims, "all men are created equal" (*Declaration of Independence, 1776*). Similarly, Ryerson's belief that democratic education "should be provided for all, and taught to all," including "the most needy" individuals in society (Ryerson, 1847, as cited in Putman, 1912, ch. V) appears to be a noble idea. But as Ryerson became a prominent name in education, the uncritical application of his ideas on First Nations education led to the establishment of the Canadian residential schools system that served to further oppress First Nations peoples.

Noddings' article, entitled "Aims, Goals, and Objectives" (2007), describes these tenets of democratic education for the purpose of presenting a framework that is useful in organizing and categorizing educational purposes:

> Consider two aims almost universally posited by educators in democratic societies: 1) to prepare students for democratic life; 2) to prepare citizens who are literate. Notice that these aims reflect interest in the welfare of both individual students and the society to which schools are responsible. It is characteristic of aims – as broadly stated educational purposes – that they reflect the values of the society served by the schools, and they are designed to establish and maintain the society's ideals. (p. 8)

In addition to the requisite of democratic education to be available to all members of society, schools play an integral role in preparing capable and literate students who can participate and contribute to society in meaningful ways. Even though the Canadian writers call these "goals" of education, Noddings' (2007) framework provides a more useful working model that addresses the concept of preparing students for life in society as an "aim," because it is a "broadly stated educational purpose" (p. 8).

The need for citizenry education arises from the implicit relationship between individuals and society. In democratic societies, individuals have responsibilities to their communities and to society, while society has an imperative to support and protect its communities and individuals. There are ethics, rules, and laws that manage the relationship between individuals and society, but without a deep understanding of these social responsibilities, people cannot fully participate in democratic processes, nor can they truly contribute to social progress.

Citizenry applies to social contexts as well. The concept of vocation and its importance to both individuals and to society was mentioned in the historical documents above and is reflected in P21's (2009) document. P21 (2009) identifies the need for social and cross-cultural skills: "Today's life and work environments require far more than thinking skills and content knowledge. The ability to navigate complex life and work environments in the globally competitive information age requires students to pay rigorous attention to developing adequate life and career skills" (p. 6). These "life and career skills" point to the concept of vocation as being more than one's job, it is a combination of training, work, and personal gratification. Vocation is one of the many ways that citizens contribute to the good of society.

The idea of citizenry should, therefore, not be confined to the domestic contexts of local, provincial, or even national fora, because there is an increasing emphasis on individual participation in global contexts spurred by the proliferation of ICTs. The first of P21's (2009) interdisciplinary themes recognizes the need for global civic participation, stating that students must develop "Global Awareness" in the followings ways:

- Using 21st century skills to understand and address global issues

- Learning from and working collaboratively with individuals representing diverse

cultures, religions and lifestyles in a spirit of mutual respect and open dialogue in

personal, work and community contexts

- Understanding other nations and cultures, including the use of non-English

  languages. (p. 2)

To be a 21st century citizen within a state, country, or nation, is also to be a citizen within the

global community; to be an Internet user, or e-citizen, is also to be a part of the global

community. This means that individuals need to develop skills and abilities to work together

at local, provincial, national, and international levels.

As a young, "new world" country, Canada has a unique genetic makeup. Its

population consists of First Nations peoples who represent the original inhabitants of the

American continents, and later immigrants from around the world, whose Canadian status

ranges from recently migrated to those who have been here for many generations. Canada's

population reflects quite a diverse range of ethnic, religious, and linguistic groups. This

reality further legitimatizes citizenry education as a tool for preparing students for life in

society, because Canadians are ultimately expected to communicate and collaborate with

people from a variety of socio-cultural backgrounds in both domestic and international fora

and in online environments.

The NCTE (2013) document considers citizenry in its definition of literacy

(examined above) by identifying the need for students to "[b]uild intentional cross-cultural

connections and relationships with others so to pose and solve problems collaboratively and

strengthen independent thought" (p. 1). This helps in delineating the aim of democratic

education to prepare students for life in society into two areas of focus: Civic duty and

collaboration. For the purpose of e-literacy theory, citizenry encompasses both civic duty and

collaboration, but a brief excursion into these two topics is warranted for a deeper

understanding of how they apply to the responsible use of technology.

Civic duty hinges on social acts of participation which are guided by knowledge of personal rights, freedoms, and responsibilities. P21's (2009) section on "Civic Literacy" highlights the political element of citizenry by emphasizing the importance of:

- Participating effectively in civic life through knowing how to stay informed and understanding governmental processes

- Exercising the rights and obligations of citizenship at local, state [or provincial], national, and global levels

- Understanding the local and global implications of civic decisions. (p. 2)

In addition to an emphasis on the individual as an autonomous agent, it is also imperative for citizens to be aware of what information about them is being collected by other parties (i.e. governments, corporations). This is especially true in the post-911 era where technology is increasingly used to monitor citizens. For example, in Canada, legislation such as the *Anti-terrorism Act* of 2015 affects individuals by extending the powers of CSIS to collect more information. One argument against this legislation is that without an adequate increase in oversight and transparency, the organization responsible for intelligence gathering and monitoring can infringe upon the rights and freedoms granted to citizens by the *Canadian Constitution* (1982) and the *Canadian Charter of Rights and Freedoms* (1982). In this case, if citizens are not careful, or worse, are unaware of threats to their civic well-being, the potential outcome is an erosion of individual rights and freedoms under the guise of security and protection. Similarly, personal information is mined by companies in real and virtual environments, sometimes without the knowledge or consent of individuals. Citizens must be equipped with critical and civic literacies to understand their rights and freedoms to protect themselves from the overreach of institutions and corporations.

It falls upon education to prepare students for life in society by equipping them with knowledge and awareness that lead to vigilant practices. Schools can achieve this by emulating real-world situations in online environments to cultivate student ability as they gradually become independent civic actors. ICTs can be used within the curriculum to cultivate civic agency by organizing simulations geared toward the knowledge and abilities of students based on the following "levels of difficulty":

> (1) *using online services*, such as city officials' information services; (2) *interacting online*, such as discussing with the officials about city planning; and (3) *producing information online*, such as writing an article concerning city planning. The easiest forms of online action are related to receiving and using, more demanding ones require interaction and the most demanding forms require the abilities to create and provide new contents. The essential difference between these levels is a change from receiving object to a self-expressive actor." (Mäkinen, 2006, p. 385)

Effective and knowledgeable citizens are cultivated through access to information and through opportunities to be agents in simulated and real online environments. As the classroom becomes a transformative space and reflects the dynamics of communities, societies, and the world, students get chances to apply the knowledge they develop in meaningful and practical ways, thus becoming participatory citizens. Mäkinen (2006) states the importance of this:

> Participatory citizens act also in the roles of developers, and they are able to have dialogical conversations with decision makers. The information society offers many potential ways to participate, such as those connected with online publishing and interaction, but at the same time citizens meet new challenges. E-citizens should have enough technical competence and readiness for online communication, and should know the formal methods for citizen participation. Though the number of ways to

participate is more than before, the threshold for participation is even higher. (p. 387)

The use of ICTs in citizenry education allows students to become e-citizens and agents of change through scaffolded approaches to prepare them for life in society. However, Mäkinen (2006) provides a useful warning about relevancy, stating "the existence of information technology is not enough for community empowerment, if it doesn't lead to any relevant activities. The main issue is not the use of technology, but *how it is used*" (p. 389). In other words, simply using ICTs to satisfy a technological requirement within educational contexts lacks relevancy and purpose, which potentially detracts from the intended experience. To mitigate this potential, Mäkinen (2006) believes that relevancy can be increased when "[t]he social and sociocultural context is also one of the key variables which defines the best practices for information technology in a particular community" (p. 389). The ethnic, cultural, and linguistic diversity found in Canadian classrooms complicates "the best practices" derived from "social and sociocultural" contexts. Mäkinen recognizes the need for individuals to use technology efficiently, effectively, and responsibly in civic duties and collaborative activities; however, approaches to e-literacy theory and practice in education must reflect the social and sociocultural contexts of the students to make learning relevant.

The second element of civic duty is collaboration. The proliferation of technology in the 21st century has provided new opportunities and challenges associated with collaborative practices for the development of citizenry education. The ISTE framework document, "Essential Conditions" (2014a), begins to address this issue by calling for the development of "Engaged Communities" where "[p]artnerships and collaboration within communities … support and fund the use of ICT and digital resources" (p. 1). Engaged communities require proactive administrators to promote professional practices by facilitating and participating "in learning communities that stimulate, nurture and support administrators, faculty, and staff in the study of technology" (ISTE, 2014b, p. 1). These communities also require knowledgeable

teachers who apply effective communication skills and model effective practices to "demonstrate fluency in technology systems and the transfer of current knowledge to new [contexts]," so that they can effectively "collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation" (ISTE, 2014d, pp. 1-2). Students, too, have a role in engaged communities because they are the ones who will soon assume the responsibilities of adult citizens once they graduate from K-12 education.

Since it has been demonstrated that schools are responsible for equipping citizens with critical and civic literacies, the ISTE documents provide additional insight for entry points on *how* and *where* digital citizenry can be addressed in education. The ISTE standards call for administrators to demonstrate professional practices by modelling and facilitating an "understanding of social, ethical and legal issues and responsibilities related to an evolving digital culture" (2014b, p. 2); and teachers must "understand the local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behaviour in their practices (2014d, p. 2). ISTE (2014c) believes that the responsible practices modelled by administrators and teachers should, in turn, expose and influence students to "understand [the] human, cultural, and societal issues related to technology" so that they can "[a]dvocate and practice safe, legal, and responsible" uses of ICTs (p. 2).

The "ISTE Standards: Students" (2014c) document states that students should become proficient at using "digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others" (p. 1). ISTE (2014c) also outlines the following as essential communication and collaboration abilities:

   a) Interact, collaborate, and publish with peers, experts, or others employing a wide
      variety of digital environments and media

b) Communicate information and ideas effectively to multiple audiences using a variety of media and formats

c) Develop cultural understanding and global awareness by engaging with learners of other cultures

d) Contribute to project teams to produce original works or solve problems. (p. 1)

It is important that students can collaborate and communicate effectively in both face-to-face contexts and through ICTs, because they will be expected to do so after they graduate and enter the work force as contributing members of society.

The focus on developing communication and collaboration skills is also reflected in P21's (2009) vision for preparing students for the future (pp. 3-4). P21 believes that students must "[d]emonstrate the ability to work effectively and respectfully with diverse teams," "[e]xercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal," and "[a]ssume shared responsibility for collaborative work, and value the individual contributions made by each team member" (p. 4).

2.3.4 Safety

The domain of safety is primarily concerned with protecting users of information and communication technology, and it extends into each of the other domains of capability, critical literacy, and citizenry. The risks associated with ICTs are so wide ranging that safety deserves its own place within e-literacy theory of knowledge and practice. This section examines the international benchmarks of ICT-related safety, the external and internal dangers that threaten ICT users, and the C3 Matrix ("iKeepSafe Digital Citizenship C3 Matrix," 2009) of ICT safety. These documents demonstrate the need for theory and practices on safe ICT use, and contribute to the overall theme of the responsible use of technology that is represented by e-literacy.

The NCTE (2013) believes, "Students in the 21st century must understand and adhere

to legal and ethical practices as they use resources to create information" (p. 4). Learning

resources are essential components of learning environments, and ICTs are being integrated

into 21st century classrooms. All learning resources have inherent risks and benefits; and

where safety is concerned, ICT-based resources present new challenges that call for

preventative approaches – not just reactive ones. For e-literacy, the domain of safety

represents the proactive measures and counter-measures that ICT users can learn and apply in

online and offline environments.

Each of the three "ISTE Standards" (2014b; 2014c; 2014d) call for safety measures to

be integrated within ICT-related curricula. Administrators are to "[p]romote, model, and

establish policies for safe, legal, and ethical use of digital information and technology"

(ISTE, 2014b, p. 2), while teachers are to "[a]dvocate, model, and teach safe, legal, and

ethical use of digital technology…" (ISTE, 2014d, p. 2). Students, the ISTE contends, should

"[a]dvocate and practice safe, legal, and responsible use of information and technology"

(ISTE, 2014c, p. 2). These documents demonstrate the ISTE's support for safe "policies,"

"advocates," and "practices" in schools, but since these standards are "broadly stated

educational purposes," they remain as aims of technological safety education until goals and

objectives are devised and implemented.

In *Education for an Information Age: Teaching in the Computerized Classroom*,

Bernard John Poole and Elizabeth Sky-McIlvain (2009) provide a more comprehensive, but

by no means complete list of potential external dangers that accompany ICT use:

- **Cyberbullying** According to www.cyberbully.org, "Cyberbullying is sending or

  posting harmful content or cruel text or images using the internet or other digital

  communication devices"…

- **Online predators** Here's what Donna Rice Hughes has to say about this problem

facing children today: "One of the attractions of the Internet is the anonymity of the user, and this is why it can be so dangerous. A child doesn't always know with whom he or she is interacting. Children may think they know, but unless it's a school friend or a relative, they really can't be sure. Often we think of pedophiles as having access to children out on the playground and other places, but because of the way the Internet works, children can actually be interacting on their home computers with adults who pretend to be children"…

- **Cybercrime** (http://www.cybercrime.gov) Stalking, cyberbullying, child abusers who use chat rooms, threatening statements and harassments are all cybercrimes of various degrees of seriousness…

- **Viruses** – [Acquiring and spreading viruses] is generally going to be through e-mail activities associated… with e-Learning activities, but can also be by file sharing (including files brought to school on portables disks and disk drives).

- **Garbage** – not objectionable material, just useless content, which leads to a whole lot of wasted time. …well-designed and well-planned e-Learning projects minimize the time wasted with (often very appealing) garbage. (p. 233)

Cyberbullying is an issue that many schools attempt to address. In my experience as a teacher in Japan and during my Bachelor of Education studies, these attempts are mostly in response to damage already done through acts of cyberbullying. What is required are proactive approaches to supersede the reactionary measures that are often too little, too late. In addition to stalkers, cyberbullies, and abusive users, cybercrime includes, but is not limited to, actions involving hacking, extortion, and theft. Administrators, teachers, and students need to be aware of these issues in order to incorporate relevant and current knowledge of safe practices into pedagogy and andragogy on responsible ICT use.

Poole and Sky-McIlvain (2009) also present other methods of protecting students in offline and online environments at school. As was examined in the critical literacy section above, censorship infringes on freedom of information. For educational purposes, it may be argued that some censorship is conducive to the process of safety instruction as students grow from dependent to independent states of agency. However, too much censorship creates a sterile environment of "cloistered virtue" (Milton, 2008, p. 247), where responsible practices have little room to be cultivated in relevant ways. To learn safe and responsible practices, students need to be guided as they are gradually introduced to more challenging environments, and this simply cannot happen in the vacuum of a completely censored, sterile environment. Instead, Poole and Sky-McIlvain (2009) suggest that schools filter "[o]bjectionable or inappropriate material," such as "sites devoted to pornography (however that may be defined), hate groups, extreme violence and other inappropriate subject matter whose content may be considered unsuitable for children at various stages of maturity" (p. 227). Among the possible solutions to filtering objectionable or inappropriate content, Poole and Sky-McIlvain (2009) offer four suggestions, in no particular order of importance:

1. **Acceptable Use Policies**: An AUP is a policy that covers the responsible use of, uses of, and consequences of the misuse of all network tools…. Schools may have several policies – for students in different divisions and for faculty. …[F]or legal reasons, the AUP should be signed by a parent or guardian and by the student.

2. **Discuss the issues with the kids**: …Early in the year, teachers should talk with their students about the need for responsible use of the resources available through the Web. …

3. **Be proactive (i.e. vigilant) as a teacher**: Teachers are charged with maintaining a safe environment in their classrooms. Students (and their parents) expect the teacher to provide protection from exposure to danger of any kind. …

4. **Filtering software and hardware**: …Most public schools […] have some type

   of Internet access filter or control. There are several types of filtering, which can

   be done by in-house software, web-based access control, in-house hardware, or a

   combination of all three. Filtering itself can be based upon an 'allowed list' of

   acceptable sites, domains, and services, or a 'blocked' list of unacceptable sites,

   domains, and services. Even the least diligent filter will block many educationally

   useful sites (such as *breast* cancer research), and allow many unacceptable sites.

   (pp. 228-229)

Through the combined approach of implementing AUPs, having discussions with students,

developing and applying proactive teacher and administrative measures, and through the use

of filters, responsible use practices can be guided and cultivated throughout learning

experiences geared toward student age and level of ability without the need for draconian

laws in education.

In addition to these external threats, internal dangers threaten ICT users and these

come in the form of plagiarism and copyright violations. On these issues, Poole and Sky-

McIlvain (2009) note,

   Once they learn about command-copy, command-paste, students are quick to figure

   out that the Internet can save them an enormous amount of thinking and writing time.

   Not only do students freely copy text for reports and essays, they freely copy images.

   (p. 231)

Along with exemption of Fair Dealing from the *Copyright Act* in Canada, "The doctrine of

Fair Use [in the United States of America,] allows students, and teachers, to use copyrighted

materials… for educational purposes, as long as citation is given correctly and content and

use restraints are followed" (Poole & Sky-McIlvain, 2009, p. 231). To prevent copyright

infringement and to promote responsible practices, teachers in Canada must not only learn

about Fair Dealing for their own sake, but practice, teach, and model it, for example through anti-plagiarism tools such as Turnitin and SafeAssign, "as soon as students begin to use the Internet for academic purposes" (Poole & Sky-McIlvain, 2009, p. 231). The areas of danger and the safety measures that Poole and Sky-McIlvain introduce demonstrate (a) the crucial need for teachers to receive instruction on safe practices during their initial teacher training, as well as throughout their careers in the form of professional development leveraged at ICT safety; and (b) the need for students to receive safety education at multiple stages throughout their K-12 experience geared toward levels of ability and appropriateness.

The next document is the "iKeepSafe Digital Citizenship C3 Matrix" (2009) and was selected because it provides a relevant approach to ICT-related safety in education. It also incorporates literature from the documents reviewed above, particularly, on ISTE's aim of digital safety education (2014b; 2014c; 2014d), as well as Poole and Sky-McIlvain's (2009) call for safety education to be cultivated over time. The "iKeepSafe Digital Citizenship C3 Matrix" (2009) is extrapolated from the "C3 Framework Promoting Responsible Use" (Pruitt-Mentle, n.d.), and "takes a holistic and comprehensive approach to preparing students for 21st century digital communication" (p. 1). Specifically, the iKeepSafe (2009) document "is designed to assist educators in integrating the concepts of cyber-safety, cyber-security, and cyber-ethics (C3) into existing technology and literacy standards and curricula," by providing "educators with guidance regarding cyber-safety, security, and ethics principles that all students should know and be able to apply independently when using technology, technology systems, digital media and information technology, including the Internet" (p. 1).

The premise of the C3 Matrix is that "[a]ll students must have the awareness, knowledge, opportunity and resources to develop the C3 skills required for full participation as informed, responsible, ethical and productive citizens" ("iKeepSafe," 2009, p. 1). Interestingly, the C3 Matrix is not determined by grade level, "rather, they represent

progressive levels of cognitive complexity at which youth should be expected to understand

and practice," and were developed "utilizing Bloom's *Taxonomy of Educational Objectives*

(2001 revised edition)" ("iKeepSafe," 2009, p. 1). This document can aid teachers,

administrators, and curriculum developers in the important transition from the broadly stated

aim of technology-related safety to that of concrete goals and objectives. iKeepSafe (2009)

defines 3C in the following ways:

- Cyber-safety addresses the ability to act in a safe and responsible manner on the

  Internet and other connected environments. These behaviors protect personal

  information and reputation and include safe practices to minimize danger from

  behavior-based, rather than hardware/software-based, problems.

- …cyber-security covers physical protection (both hardware and software) of

  personal information and technology resources from unauthorized access gained

  via technological means….

- Cyber-ethics is the discipline of using appropriate and ethical behaviors and

  acknowledging moral duties and obligations pertaining to online environments

  and digital media. (p. 2)

Within these definitions are subjects that link back to the other three domains of e-literacy:

Capability is represented by knowledge of hardware and software safety; critical literacy is

found in the selection and application of safe practices according to relevant environments

and circumstances; and citizenry is identified through the "moral duties and obligations" that

ICT users need to practice in order to be responsible e-citizens.

Lastly, it should be noted that the iKeepSafe document includes two resources that aid

in the construction and assessment of curricula that addresses safe ICT knowledge and

practices. The first is the "C3 Framework Promoting Responsible Use," which provides

instruction on 3C requirements for beginner, intermediate, and proficient students

("iKeepSafe," 2009, pp. 3-8). The second is the "Augmented Technology Literacy Standards

for Students" graph ("iKeepSafe," 2009, pp. 9-10), which is "designed to help educators see

how C3 concepts… can be integrated into existing curricula" (p. 9). This graph also serves as

a cross-referencing tool to determine how and where curricular materials and pedagogies are

aligned with international benchmarks ("iKeepSafe," 2009, p. 9), such as the "ISTE

Standards: Students" (2014c) document reviewed in the literature above.

Safety is an integral domain of e-literacy because it contributes to the well-being of

ICT users. The documents examined in this section identify a wide range of areas that ICT

safety needs to address, as well as providing methods for translating aims of safety into goals

and objectives for use in educational curricula. It is important that teachers and administrators

understand not just *what* ICT safety is, but also *how*, *when*, and *why* it is applied so that they

can be effective educators and prepare students for the challenges of life in society.

2.4 Benchmarks and Trends of Education Policies in Ontario

The previous section examined international documents with respect to the first

research question: What are the international trends and benchmarks of e-literacy in

education and how do Ontario's K-12 curricula incorporate these benchmarks into 21st

century revisions? I developed the research question this way because my literature review of

provincial and Canadian documents yielded little in describing *what* the responsible use of

ICTs is. Instead, I found literature that simply names "responsible technology/ICT use"

without defining it (Ontario K-12 curricula, found below) or that names some other form of

digital literacy (Ontario, 2014; Pungente, Duncan, & Andersen, 2005), such as those

reviewed in the international documents above (Trilling & Fadel, 2009). Conversely, I found

many documents that explored theories and approaches leveraged at using ICTs to develop

different traditional literacies such as writing (Peterson & McClay, 2012), science (Luu &

Freeman, 2011), and assessment (Burke & Rowsell, 2007). This thesis, however, is directed at *what* e-literacy is, not *where* and *how* ICTs can supplement traditional literacies.

To provide some context to Ontario's current landscape of ICT-focused education, I turn to John J. Pungente, Barry Duncan, and Neil Andersen (2005) and R. D. Gidney (2002) to examine Ontario's history of media literacy and information technology programmes, respectively. Pungente et al. (2005) state, "the generally accepted definition of media literacy in Canada was developed for the Ontario Ministry of Education in 1987" (p. 142), and "[i]n 1989 Ontario's Ministry of Education released new curriculum guidelines that emphasized the importance of teaching media as part of the regular English curriculum" (pp. 142-143). The 1990s in Ontario bore witness to rapid shifts in provincial politics as the New Democratic Party (NDP) supplanted the Liberal government who held power for only one four year term. In 1993, the NDP government established a "royal commission on education" with "two full-time co-chairs," Monique Bégin and Gerald Caplan (Gidney, 2002, p. 224). Bégin and Caplan identified four main areas of improvement, one of which was "Information Technology," prompting Gidney (2002) to call it "a subject that provoked the commissioners' uncritical enthusiasm. Information Technology was to become a transformative influence on the way students learned and teachers taught, changing relationships among students, and between students and teachers" (p. 226). While such uncritical enthusiasm can lead to exhausted budgets, dusty SMART Boards, and untrained teachers, it is undeniable that ICTs have transformed society and education within an incredibly short time.

Another political change that shaped ICT education in Ontario occurred in 1995 when the Progressive Conservative (PC) party ousted the NDP government: "Between June 1995 and the spring of 1998, the 'Mike Harris government' imposed changes on Ontario schools that were remarkable in scope, in the sheer speed of execution, and in the turmoil they engendered" (p. 234). These changes stemmed from a campaign pamphlet entitled *The*

Common Sense Revolution (CSR), which "was both an election strategy and a statement of neo-conservative political philosophy" (John Ibbitson, 1997, as cited in, Gidney, 2002, p. 234). Pungente et al. (2005) note the growth of media education in 1995,

> the Ontario Ministry of Education more specifically outlined what students are expected to know and when they are expected to know it; these expectations are captured in areas defined as Listening and Speaking, Reading, Writing, Viewing, and Representation, and are primarily found in Language Arts classes. (p. 143)

The thinly veiled neo-conservative threat of the Common Sense Revolution did not spare education from its cuts, but an optional Grade 11 media studies course that "allows for in-depth exploration of media… survived attempts at elimination by the [PC] government in 1996" (Pungente et al., 2005, p. 143). The new policies produced by PCs included a "combined Science and Technology guideline… published in March 1998" (Gidney, 2002, p. 240) and "[f]urther revisions to the Language Arts curricula in 1998 extended media education as a required part of the curricula beyond Grades 1-9 to include Grades 10-12" (Pungente et al., 2005, p. 143). These documents and others like them were designed to reverse the previous government's social approaches to education published in *The Common Curriculum* in favour of progressive administrative and neo-conservative policies. Gidney (2002) explains:

> The restreaming of grade 9 by the Harris government (with, it must be added, the support of large numbers of teachers and parents) and the concomitant introduction of 'flexible' streaming in the later grades, with differentiated course content, constituted a substantial reassertion of more traditional views. So, indeed, did the new elementary guidelines, stripped as they were of the values, equity, and anti-racism rhetoric that pervaded *The Common Curriculum*. (p. 240)

By the year 2000, "there was new growth in elementary and secondary school media

education, as media education became a mandated part of the English Language Arts curriculum across the country" (Pungente et al., 2005, p. 142).

The emphasis on media literacy in Ontario's K-12 curricula persists into 21st century revisions of policy documents. Yet, as was explored in the previous sections of the literature review, media education is simply not enough to address all of the digital literacies nor the domains related to e-literacy. To better understand where the gaps in Ontario's K-12 education exist, the following sections examine a selection of Ontario's K-12 curricular documents to identify whether provincial updates and revisions are consistent, exceeding, or falling behind international benchmarks of e-literacy theory and practice. A study on pilot projects in Ontario's K-12 education is also included to examine grassroots approaches.

2.4.1 Selected Review of Ontario's K-12 Curricula

In addition to identifying and understanding the successes, challenges, and possibilities within teacher education in Ontario, a review of curricular documents is necessary because teacher education and the curricula are inextricably connected. A selection of relevant curricular documents is presented in this section to identify where and how Ontario's K-12 education addresses ICTs in education on responsible use. These documents have been selected based on relevancy to the general theory of e-literacy and each subject's specific relation to the four domains. For example, *Science and Technology* (Ontario, 2007a), *Computer Science* (Ontario, 2008), and *Technological Education* (Ontario, 2009a, 2009b) reflect the domain of capability; *Language* (Ontario, 2006) and *English* (Ontario, 2007b, 2007c) reflect the domain of critical literacy; *Social Studies, History and Geography* (Ontario, 2013a), and *Canadian and World Studies* (Ontario, 2013b, 2015c) reflect the domain of citizenry; and *Health and Physical Education* (Ontario, 2015a, 2015b) reflects the domain of safety. Even though these subjects represent distinct areas of instruction, they are interdependent and complimentary in their own right and within the context of e-literacy. The

Full-day Early Learning – Kindergarten Program (Ontario, 2010b) represents the entry point

for which ICTs are expected to be used in the classroom. Each of the curricular documents

reviewed include a specific section on the role of technology or ICTs with respect to that

particular subject.

For some reason beyond my understanding, the Language (Ontario, 2006) and

English (Ontario, 2007b, 2007c) documents use the term "technology," while all other

documents, including Science and Technology (Ontario, 2007a) that was also updated in the

same year, use the term "information and communications technology" (Ontario, 2008,

2009a, 2009b, 2010b, 2013a, 2013b, 2015a, 2015b, 2015c). It should be noted that overall,

each and every one of these subjects specifically address technology/ICTs in education. The

content for technology/ICT within each of these subjects is, however, lacking. Even though

they recognize that technology/ICTs and the Internet are valuable learning resources, the

section on responsible use is copied verbatim across all of the selected documents from

Ontario's curricula (2006, 2007a, 2007b, 2007c, 2008, 2009a, 2009b, 2010b, 2013a, 2013b,

2015a, 2015b, 2015c):

> Although the Internet is a powerful learning tool, there are potential risks attached to
>
> its use. All students must be made aware of issues related to Internet privacy, safety,
>
> and responsible use, as well as of the potential for abuse of this technology,
>
> particularly when it is used to promote hatred.

This quotation identifies the acknowledgement of the inherent dangers of technology/ICTs, as

well as the need for "responsible use," yet, it fails to provide further explanation on exactly

what responsible use is.

This is a crucial distinction to make, because I believe teacher education institutions

in Ontario prepare teacher candidates according to Ontario's curricular standards. If the *what*

of responsible use is not clearly defined and emphasized, teacher education institutions

cannot provide instruction on *why* it is necessary, *when* and *where* to apply it, or *how* efficient and effective practices of responsible use can be carried out. I believe that if curricular policy changes to reflect a new emphasis on the responsible use of ICTs through e-literacy, teacher education institutions will have no choice except to follow suit or risk becoming obsolete.

2.4.2 Achieving Excellence

The *Achieving Excellence: A Renewed Vision for Education in Ontario* document (Ontario, 2014) is useful in understanding Ontario's 21st century approach to policy on technology in education. This document is included in this literature review because it provides an opportunity for Ontario's curricular policy to be compared to the international benchmarks previously examined, and to Ontario's curricular documents currently in circulation. The "Mission Statement" explains, "Ontario is committed to the success and well-being of every student and child" and that "Ontario will cultivate and continuously develop a high-quality teaching profession and strong leadership at all levels of the system" (Ontario, 2014, p. 1).

The document begins with a recognition of the present reality of technological ubiquity and interconnectedness that students face when they leave the K-12 education system: "Our graduates are… entering a world that is more competitive, globally connected and technologically engaged than in any other period in history" (Ontario, 2014, p. 1). The document also notes, "as the world becomes more interconnected and our students become more technologically sophisticated, there continues to be too much inconsistency in the way technology is used in the classroom" (Ontario, 2014, p. 2). This points to the need for a revolution in pedagogical approaches to technology – especially concerning policies and practices on responsible ICT use in the classroom, in teacher education and professional development, and in administrative leadership.

"Achievement" in this document "also means raising expectations for valuable,

higher-order skills like critical thinking, communication, innovation, creativity, collaboration, and entrepreneurship," which are "the attributes that employers have already [indicated] they seek out among graduates" (Ontario, 2014, p. 3). Additionally, achieving excellence requires "policy decisions and the allocation of resources… to be guided by evidence and research" (p. 2). Thus, Ontario's pursuit of achieving excellence is directly tied to preparing students for the challenges that they will face in an unknown, but technologically demanding future.

Ontario's vision of 21st century education recognizes the need to develop both "compassionate and actively engaged citizens who graduate high school equipped for the technology-driven, globalized world," and "well-rounded individuals who have not only strong basic skills but also the critical thinking skills, imagination and resilience to excel in – and create – the new jobs of tomorrow" (Ontario, 2014, p. 20). Regarding Canada's future, K-12 education is a two-fold, socio-economic investment. This investment is directed at preparing individuals for success, which in turn affects society in a positive way through a collective and cumulative impact of active and educated individuals.

2.4.3 A Shifting Landscape

A Shifting Landscape: Pedagogy, Technology, and the New Terrain of Innovation in a Digital World (Beggs, 2012) was selected for review because it provides an in-depth cross-section of recent grassroots approaches to integrating ICTs into K-12 classrooms. This pilot study included 34 English-language and 12 French-language school boards in Ontario "to determine the use and impact of technology on student engagement and achievement and on the instructional practices for 21st Century teaching and learning" (Beggs, 2012, p. 1).

Drawing from Michael Fullan's (2012) research, Beggs (2012) emphasizes three main themes of "Pedagogy," "Technology," and "Change" in the study (p. 1). These themes apply to the theory of e-literacy knowledge and practice through their relationships to the research question. The theme of pedagogy reflects research questions two and three through

66

its connection to "teacher training and teacher practice" (Beggs, 2012, p. 1). Beggs (2012)

reveals the importance of this through a participant's comment:

> Individuals in several projects spoke about the need for the creation of a safe,
> collegial, professional learning environment as a necessary component for teachers to
> be honest about their technological readiness for undertaking pedagogical challenges
> in various subject areas. Another mentioned that the skills of 21st Century teaching
> and learning, such as creativity and critical thinking, needed to be defined as a
> starting point quite apart from technological use. (p. 145)

The theme of change includes "implications for programming and policy" (Beggs,

2012, p. 1) which relates to all of the research questions. Regarding research questions 2 and

3, Beggs (2012) presents participant feedback on professional development, such as its role

as "a vehicle for program change and overall vision change," and its need to "be woven into

pedagogy and changes in curriculum development for 21st Century skills to be understood

and practised in schools" (p. 151). Related to research question one and implications of

policy, Beggs (2012) notes,

> several school boards have developed policies that include the use of technology in
> schools and classrooms, but most seem to be in the developing stages, reviewing past
> practice, and looking ahead to place ethical and safe use of technology into school
> board policy. Many considerations were mentioned in this realm, and it seems clear
> that understanding of the new breadth of educational practice beyond school and
> school board to local and world-wide connections are being considered carefully prior
> to policy being implemented. (p. 151)

Indeed, Ontario must look to the international trends and benchmarks as well as within its

own grassroots movements to become a world leader in 21st century education.

Beggs (2012) notes three overall points derived from the projects in the study. The

67

first is that "it became apparent that these projects have acted as catalysts for school boards to explore significantly new tools and processes to strengthen the alignment of technology and pedagogy" (p. 2). Second, "through the work of these projects, school boards are… establishing cross departments and jurisdictional responsibilities to focus on the tools and 21st Century skills that students require" (p. 2). Third, "Of primary importance across and among projects was the issue of students using technology safely and effectively in schools" (p. 2). These points are useful in understanding the current challenges faced by schools as they cope with the realities of education in the 21st century. They also reflect how "school boards are exploring new organizational strategies that push aside more fragmented approaches to using technology" (p. 2). Beggs' study recognizes the progress that individual school boards have recently made, but I argue that without support from curricular policy and improved teacher education, updating Ontario's approach to 21st century education will be a long and lonely road for these school boards to travel: "School boards reflected on the importance of integrating professional development initiatives and curricular directions so that they were not splintered, fragmented, or approached in an isolated way" (Beggs, 2012, p. 3).

Amongst the documents in this section, it is evident that several congruencies exist at the "Aims" (Noddings, 2007) level. For example, all the documents recognize that technology is being embraced by society more and more each year; that schools have the responsibility for preparing students for life in society; and that students require better instruction on how to use technology efficiently, effectively and responsibly. However, since these acknowledgements are rather abstract and vague, there is a general lack of methodology in Ontario's (2014) document regarding logistical approaches to *what*, *when*, and *how* that manifest "Aims" into "Goals" and "Objectives" (Noddings, 2007). On one hand, this document illustrates the reality that Ontario is keeping abreast with international benchmarks on being aware that technological proliferation is changing the landscape of society and

education. On the other hand, Ontario is not producing literature that proactively addresses

successes, challenges, and possibilities in 21st century education regarding the responsible use

of ICTs.

CHAPTER 3

METHODOLOGY

3.1 Research Design

The research involved a case study approach and a mixed methods design. The case study was chosen because of my experiential knowledge and the social and institutional contexts outlined by the research questions (Stake, 2000, p. 444). The case study format was also chosen for its intrinsic and instrumental properties. Intrinsically, it allows one to gain a "better understanding of this particular case" of teacher candidate experiences, and instrumentally, it can "provide insight into an issue," such as e-literacy in teacher education, "to advance understanding of that other interest" (Stake, 2000, p. 445).

The mixed methods design was selected to "build on the strengths of both quantitative and qualitative data" that was to be collected (Creswell, 2012, p. 535). In particular, a convergent parallel mixed methods design was applied to "simultaneously collect both quantitative and qualitative data, merge the data, and use the results to understand [the] research problem" (Creswell, 2012, p. 540). This convergent parallel design was chosen because it provided opportunities for strengths in one form of data collection to mitigate weaknesses in the other form (Creswell, 2012, p. 540), by combining the "advantages of each form of data" (p. 542).

The data collection process began in March of 2015 and ended in May 2015 and lasted for six weeks. It consisted of two instruments that were designed at the same time and were comprised of themes derived from the research questions. Both instruments employed a cross-sectional design to measure attitudes and practices at one point in time (Creswell, 2012, p. 377). The cross-sectional design was also selected because it can "*measure community needs* of educational services as they relate to programs, course, school facilities projects, or involvement in the schools or in community planning," and "*evaluate a program*" to provide

useful information to policy makers and curriculum designers (Creswell, 2012, pp. 378-379). Measuring needs and evaluating a program are important to this research because I endeavour to use it to improve the current state of responsible use of ICT theory and andragogy in teacher education institutions and ultimately, pedagogy in K-12 education. These elements of critical inquiry are reflected in the themes used in the online survey questionnaire and the focus group discussions. The themes were derived from the research questions and focus on understanding the educational contexts of the participants, their attitudes, and practices with ICTs and responsible use, and their experiences within teacher education in Ontario.

3.1.1 Situating the Researcher

As the sole researcher of this thesis, it is important to note that I had been a teacher candidate at the same teacher education institution in 2012-2013. This means that I was familiar with the context of the Bachelor of Education programme at this institution and had experienced an instructional technology course similar to those involved in the study. The research questions had been developed out of my own experiences as a teacher candidate and throughout my Graduate studies from 2013 to present. My experiences within this setting aided me in identifying gaps in research and practice on responsible ICT use in Ontario's K-12 policy and practice, as well as in teacher education. Recognition of these gaps prompted me to conduct research aimed at examining the experiences of other teacher candidates to identify the range and depth of this 21st century issue.

As a graduate student, I had the opportunity to experience first-hand processes involving collecting, transcribing, and analyzing data for academic purposes. This allowed me to develop and refine my abilities so that they could be leveraged at the current task of rigorous and ethical research. I also have the opportunity to work under the guidance and tutelage of professors who have extensive experience in areas related to this research.

3.2 Literature Review

The literature review is "based on a body of completed works, rather than new research" (Evans & Kowanko, 2000, p. 33). This means that while the literature review is not technically a research instrument designed to collect raw data, it still requires an examination of the methodology used to compile it. Evans and Kowanko (2000) write, "Literature reviews play an important role in the advancement of a discipline, because they accumulate past endeavours, summarise major issues and are an important way to disseminate the information generated by a large number of individual studies" (p. 33). Since "[literature] reviews deliberately aim at accumulating knowledge in a specific area, they play a major role in the progress of a discipline in that they bring together previous work, identifying past achievements and possible future directions" (Feldman, 1971, as cited in Evans & Kowanko, 2000, p. 34). Additionally, it is suggested that "literature reviews also have great information-gatekeeping potential because knowledge is communicated to undergraduates and the lay public through reviews…" (Cooper & Rosenthal, 1980, as cited in Evans & Kowanko, 2000, p. 34). This thesis is an example of how a literature review offers a wealth of information as it acts as a gateway to a range of academic knowledge on e-literacy and the responsible use of ICTs.

The literature review was directed at addressing the first research question: What are the international trends and benchmarks of e-literacy in education and how do Ontario's K-12 curricula incorporate these benchmarks into 21st century revisions? To accomplish a deep understanding of e-literacy in education, a rigorous review was adopted "to emphasize the importance of an extensive, systematic process of identifying, appraising and summarizing" the research on this topic (Evans & Kowanko, 2000, p. 35). The literature examined was gathered from a wide range of documents comprised of international and national documents, scholarly journals, books, and websites from government, private, and public sources. I was

able to access peer-reviewed journal articles through the resources of my graduate institution, and the Internet provided alternate routes for additional resource collection. The keywords used to search for documents included, but were not limited to: e-literacy, digital literacy, ICT literacy, media literacy, ICT capability, critical literacy, e-citizenry, citizenry education, and technology safety education. The review of curricular documents employed the "find" function (Ctrl+F) to search for the following keywords: e-literacy, ICT, technology, digital, online, Internet, social media, capability, access, critical literacy, citizen, and safe.

Temporally, most of the documents in the literature review range from the 20th century CE to present, while one document originates in the 17th century CE, and another two from 4th century BCE. Despite the distance in time between the modern, renaissance, and classical documents found in the literature review, the meaning contained therein speaks to the content's relevancy and appropriateness. Geographically, documents featured in the literature review span international, national, and local contexts. In order to examine international benchmarks related to responsible ICT use in education, it was necessary for the literature review to include material outside the scope of Canadian content to incorporate a survey of current global trends. Once an exploration of the international trends and benchmarks had been established, the next step was to examine Canadian documents, specifically ones from Ontario, in order to understand the first research question within the context of the overall thesis.

3.3 Participant Selection

Potential participants were selected through "purposeful sampling" (Creswell, 2012; Bouma, Ling, & Wilkinson, 2012, p. 140), wherein the researcher "intentionally select[s] individuals and sites to learn or understand the central phenomenon" (Creswell, 2012, p. 206). I collected and analyzed data from volunteer participant teacher candidates at one teacher education institution in Ontario. Through this method of purposeful sampling, the

data collection was channeled into sampling strategies geared to generate specific intents (Creswell, 2012, p. 206).

The following sampling strategies were incorporated into this thesis to address the particulars of the research questions:

- Maximal Variation Sampling – To develop many perspectives;

- Homogenous Sampling – To describe some subgroup in depth;

- Theory or Concept Sampling – To generate a theory or explore a concept.

    (Creswell, 2012, p. 207)

The maximal variation sampling strategy can be used by researchers to purposively examine "cases or individuals that differ on some characteristic or trait" (Creswell, 2012, pp. 207-208). For this thesis, maximal variation sampling allowed me to analyze and compare data based on demographic differences within the participant population. Homogenous sampling can be carried out where "the researcher purposefully samples individuals or sites based on membership in a subgroup that has defining characteristics" (Creswell, 2012, p. 208). Participants in this research were targeted based on their membership status as teacher candidates. Theory or concept sampling "is a purposeful strategy in which the researcher samples individuals or sites because they can help the researcher generate or discover a theory or specific concepts within the theory" (Creswell, 2012, p. 208). This applies to the pursuit of the research in developing the theory of e-literacy as an effective, efficient, and responsible approach to using ICTs in everyday contexts, particularly in educational settings.

The participants involved in this research were all teacher candidates enrolled in a teacher education programme (Bachelor of Education degree) at a post-secondary institution in Ontario during the 2014-2015 academic year. The participants were drawn from two areas of this teacher education programme: concurrent (simultaneous enrollment in an

undergraduate degree and the bachelor of education degree), and consecutive (an

undergraduate degree had already been completed). At the time of data collection, all

participants belonged to one of four designations: Concurrent, Consecutive Primary/Junior

(P/J), Consecutive Junior/Intermediate (J/I), or Consecutive Intermediate/Senior (I/S).

3.4 Data Collection

Two instruments were employed to collect data: an online survey questionnaire

(Appendix C) and focus group discussions (Appendix D). With the appropriate permissions,

these instruments were executed using resources from the target institution to send emails to

teacher candidates for information and recruitment purposes, and to construct and

disseminate the questionnaire using a reputable online survey program. The research was

conducted over a period of two months near the end of the school year, allowing for teacher

candidates to gain the maximum amount of in-class instruction and practicum placement

experience before they were asked to provide information on their lived experiences in the

programme. The instruments were applied to collect responses from participants and the data

generated was leveraged at the second and third research questions, respectively: What can

the lived experiences of teacher candidates reveal about the target institution's theoretical and

practical requirements of e-literacy for in-class and practicum assessment? How can the lived

experiences of teacher candidates, with respect to e-literacy theory and practice, contribute to

the development of teacher education programmes in the 21st century?

3.4.1 Recruitment and General Procedures

Approval to conduct the study at the target institution was granted by the Research

Ethics Board and by the dean at the target institution (Appendix A). The dean's permission

allowed for data collection to occur and granted access to use office resources to email all of

the teacher candidates enrolled in the 2014-2015 academic year for the purpose of

recruitment.

I was also granted permission from three professors within the target faculty to enter their classrooms and make in-person announcements to teacher candidates (Appendix B). The announcements contained information about the incoming emails from the faculty office and about the research itself, including the voluntary nature of participation in the research and the measures taken to protect participant identity and confidentiality. In addition to the precautionary measures built into the online survey questionnaires and the focus group discussions, all of the emails were unidirectional in nature: Emails were sent from me to the office, and then from the office to the teacher candidates. No contact information for potential or actual participants was ever collected.

3.4.2 Online Survey Questionnaires

The online survey questionnaire was used to collect both quantitative and qualitative data from participants using closed-ended, open-ended, and semi-closed-ended (Likert scale) questions. Closed-ended questions are practical because participants can answer using preset options. This potentially enabled participants to "feel more comfortable knowing the parameters of response options," (Creswell, 2012, p. 386).

The open-ended questions allowed participants to supply their own answers, effectively allowing them to "create responses within their cultural and social experiences instead of the researcher's experiences" (Neuman, 2000, as cited in Creswell, 2012, p. 387). The semi-closed-ended questions that took the form of Likert scale questions contained "all the advantages of open- and closed-ended questions," and the optional comment boxes provided participants with opportunities to write about or expand upon answers "that may not fit the response choices" (Creswell, 2012, p. 387). Data generated through this online survey questionnaire was both quantitative and qualitative in nature.

Participation in the online survey questionnaire was voluntary and teacher candidates could participate by clicking on a hyperlink found in the emails from the office. These emails

also included attached documents that described in detail the nature of the online survey and the measures taken to protect participant identity and confidentiality (Appendices E, G, & I). The online survey was constructed using the target institution's access to FluidSurvey.com. This resource met the safety and ethical standards reached between myself and the Research Ethics Board. Consent was implied through the submission of a questionnaire, which was made possible through a "submit" button on the final page of the survey.

The nature of the online survey meant that volunteer participants could theoretically complete the survey at any time and from any place, as long as a reliable Internet connection was available and the participant had the access to the survey hyperlink. Using an online survey has implications of excluding populations who do not or choose not to have access to the Internet. However, this research did not exclude any potential participants because all of the participants at the target institution were required to use the Internet for information retrieval and communicative purposes associated with their studies.

The online survey questionnaire was selected because of the potential it offered for increased safety and ethical considerations for participants, such as reduced risks and heightened confidentiality measures. Kraut et al. (2004) also believe that research done over the Internet can be "less expensive and easier to conduct" (p. 106), and it can be "automated" by reducing or removing the need for a researcher to administer and supervise data collection tools (p. 107). For this research, the online survey format offered additional benefits because, "Unlike conventional paper-based questionnaires, Web surveys are both flexible… and less error prone (because they do not require human transcription)" (Kraut et al., 2004, p. 107). The response rate for the online survey questionnaire was 13.04%, but it is important to note that lower than traditionally accepted response rates should be expected when employing online surveys (Kraut et al., 2004, p. 108).

3.4.3 Focus Group Discussions

Focus groups "combine the strengths of in-depth interviewing and observation in a group context" (Bouma et al., 2012, p. 232). Focus group discussions were selected as a data collection tool because they go deeper into the lived experiences of participants to generate qualitative data by offering participants the opportunity to "feel free to [discuss] what [is] important to them, free to tell their stories and to describe their perceptions and their feelings" (Bouma et al., 2012, p. 46). Since focus groups are useful in "learning about public opinion on a variety of issues," they can "generate data on a cross-section of views and provide observations of different parties reacting to each other's ideas" (Bouma et al., 2012, p. 232). Within the context of teacher education and responsible ICT use, the focus group discussions allowed for a cross-section of attitudes, opinions, and experiences from teacher candidates in a dynamic group setting.

The focus group discussions consisted of a semi-structured format that allowed for a flexible and adaptive discussion process (Bouma et al., 2012, p. 286). This semi-structured format employed open-ended questions to collect qualitative data by offering participants opportunities to describe their experiences and to build on the input generated through group discussion. The semi-structured format also allowed for the discussion to deviate from the question outline if an unforeseen, relevant issue or topic was brought up by participants. The data generated by this collection tool was qualitative in nature.

Recruitment for the focus group discussion occurred through schedules that were made available through emails from the office. These emails also included attached documents that described in detail the nature of the focus group discussion and the measures taken to protect participant identity and confidentiality (Appendices F, H, & J). The focus group discussions were held at the target institution with permission granted from the Research Ethics Board and the dean.

Participation was voluntary, but it required teacher candidates to access the emails from the office, refer to the focus group discussion schedule, and go to site of the discussion at the correct date, time, and place. Before participating in the focus group discussions, participants were given two copies of the documents found in the emails that described in detail the nature of the focus group discussions and the measures taken to protect participant identity and confidentiality. Volunteers could not participate in the focus group discussion without first providing consent by signing and submitting a focus group and an audio consent form (Appendix H & K).

The focus group discussions were recorded using two devices. The primary device was a digital recorder and the secondary device was an iPad. The two devices were placed in strategic locations and the secondary device acted as a backup, since it is always good practice to be prepared for technical problems. The discussions followed an outline and hand-I made notes throughout the process. A total of eight teacher candidates volunteered to participate in the focus group discussions, representing an in-depth cross-section of the attitudes, opinions, and lived experiences from eight unique perspectives.

3.5 Data Analysis

Data analysis must reflect the research design. Since the research was conducted through a mixed-methods approach, the analysis adopted a convergent parallel design (see Figure 2 below). This design allows for a combined coding and theming process that "enables a researcher to gather information that uses the best features of both quantitative and qualitative data collection" (Creswell, 2012, p. 542). Due to the nature of the data collected from the online survey questionnaire and the focus group discussions, it must be noted that in terms of priority (Creswell, 2012, pp. 548-549), an emphasis was placed on the qualitative analysis in the report.
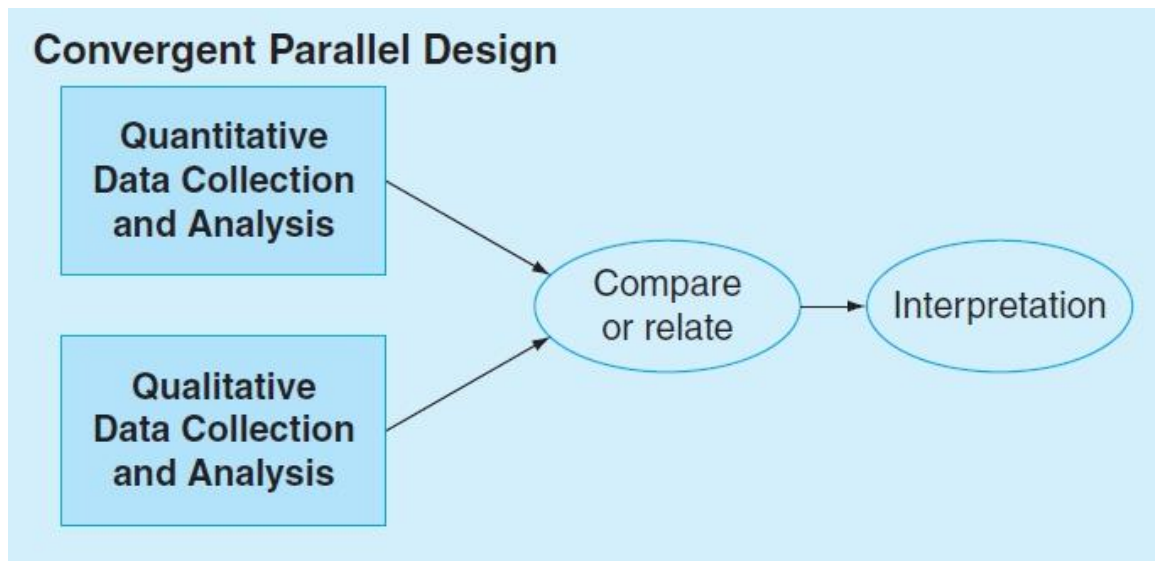
Figure 2. Convergent parallel design of a mixed methods approach. Adapted from *Educational research: Planning, conduction, and evaluating quantitative and qualitative research* (4th ed.), by J. W. Creswell, 2012, p. 541. Copyright 2012 by Pearson Education, Inc.

3.5.1 Survey Questionnaire: Quantitative and Qualitative Data

The data collected from the online survey questionnaire was organized and calculated using the tools within the Fluid Survey program. The quantitative data was gathered from close-ended and Likert scale questions and included information on participant demographics, opinions, and lived experiences. Quantitative data was analyzed according to frequency and percentage. Demographic and relevant data were also crosstabulated, where appropriate. Analysis of the quantitative data is presented in Chapter 4 using tables and each table is accompanied with a description of important findings.

Qualitative data in the online survey questionnaire was submitted by participants through the optional comment boxes that accompanied the open-ended, Likert scale, and selective close-ended questions. I coded and organized the qualitative data according to the survey questions and aided in identifying overall themes that appeared in the qualitative data

collected from the focus group discussions.

3.5.2 Focus Group Discussions: Qualitative Data

I conducted two focus group discussions to collect qualitative data using two digital audio recording devices. Qualitative data was generated through participant responses to open-ended questions and the discussions that ensued. I transcribed the raw data from both discussion groups and applied thematic analysis to "unearth the themes salient in [the] text at different levels, and … to facilitate the structuring and depiction of these themes" (Attride-Stirling, 2001, p. 387). In the analysis of the transcriptions, I also coded and themed participant input on a word-processing program using "*thematic networks*" to organize content and "to explore the understanding of an issue or the significance of an idea" (Attride-Stirling, 2001, pp. 386-387) on topics related to e-literacy.

3.6 Ethical Considerations

With the goal of treating participants with "dignity and respect" (Bouma et al., 2012, p. 165), the form and content of the data collection methods contain measures to protect the identity and confidentiality of the participants and myself. The inclusion criteria targeted the entire population of teacher candidates at the target institution, so no individual was excluded on any basis. As the teacher candidates were all of adult age, the potential participants were recognized by the Research Ethics Board (REB) as competent individuals who could represent themselves. Additionally, the REB and I recognized that the risks associated with the data collection tools were low for the online survey questionnaire and low-to-medium for the focus group discussions. These levels of risk were determined by the nature of the tools and the contexts in which they operated. The safety and confidentiality measures included in the data collection tools were incorporated into the research to counter the potential risks to participants, myself, and the research.

3.6.1 Participation

Participation in the research was voluntary and the teacher candidates had to opt-in to participate in an online survey questionnaire and/or a focus group discussion. Withdrawal from the online survey questionnaire could be done without penalty of any kind at any time before the survey was submitted. However, withdrawal after a survey questionnaire had been submitted would have been impossible, since no identifying marks were required and it was requested that participants refrain from including identifying marks anywhere within the survey questionnaire. Participants also had the right to refuse answering any of the questions found within the online survey questionnaire and still be included in the data collection process. While all submitted questionnaires were accepted, partially completed questionnaires were not included in the data analysis. Completed questionnaires containing questions that participants refused to answer were included in the analysis.

Participants could also withdraw from the focus group discussions at any time during the discussion by leaving the room where focus group was being held without penalty of any kind. All participant input for each focus group discussion was transcribed as one collective opinion. Thus, withdrawal from a focus group discussion would have been impossible after its conclusion, because the transcription process combined all participant data into one collective group identity. Participants were also under no obligation to answer any of the questions during a focus group discussion and remain a part of the research.

3.6.2 Confidentiality

The survey questionnaire was designed to protect participant identity by requesting that participants refrain from including any identifying marks. The collection of survey questionnaires was done online, so there was no contact between the participants and myself during this part of the data collection phase.

Only the audio portion of the focus group discussions was recorded, eliminating any

potential for visual cues to identify participants. Participant identity was further protected

through the transcription of audio data, as the input from all participants was transcribed as

one collective opinion. Additionally, all participants were reminded and encouraged to

respect the opinions, attitudes, and experiences of their peers. No contact information was

collected for either of the data collection tools or any other purposes.

CHAPTER 4

FINDINGS

The data contained in this section was collected and analyzed to gain an understanding of the lived experiences of teacher candidate participants from a range of perspectives. Section 4.1 provides information about the research participants. Sections 4.1.1 – 4.1.4 contain analyses of the quantitative and qualitative data collected from the online survey questionnaire [n = 84]. Section 4.2 describes the context of the focus group discussions. Sections 4.2.1 – 4.2.4 present findings developed from the qualitative data collected during these discussions. Please note that participant identifiers used to attribute comments within each table are numbered according to their order of appearance within that table, i.e. Participant 3a-2 was the second participant to comment within Table 3a.

4.1 Research Participants: Teacher Candidates

The research participants consisted of teacher candidates from the target institution during the academic year of 2014-2015. The total enrolment (target population) during this year was 644 teacher candidates. Three hundred and ninety-six were enrolled in the Consecutive programme, which lasted eight months and consisted of three divisions: Primary/Junior (P/J), Junior/Intermediate (J/I), and Intermediate/Senior (I/S). Two hundred and forty-eight were enrolled in the Concurrent programme, which is five-year programme that combines an undergraduate degree with a Bachelor of Education degree. Additionally, the Concurrent programme is being gradually phased out by the target institution, so Concurrent teacher candidates included in this study are from years two through five. Due to the timing of the data collection, P/J, J/I, and I/S teacher candidates had completed their practicum placements and were writing their end of the year exams, while the Concurrent teacher candidates had completed several practicum placements and had received anywhere from four to 10 semesters of education within the target institution.

Within the target population of 644 teacher candidates across all programmes, 84 volunteered to participate in the online survey questionnaire, resulting in a completion rate of 13.04%. The analysis is organized into four sections: (1) demographic overview, (2) ability and use of ICTs, (3) perceptions of e-literacy, and (4) e-literacy instruction and assessment.

4.1.1 Demographic Overview

Table 1 presents a demographic overview for the sample population of participants, including the frequency and percent of three variables: gender, age bracket, and programme. The sample population consisted of 84 participants [n = 84] who volunteered to take part in the online survey questionnaire. The totals for the two self-identified genders input by the sample population was 73 females (86.90%) and 11 males (13.09%). The age range of participants was measured using the following brackets: 20-29, 30-39, and 40+. The sample population totals for each age bracket are 72 in the range of 20-29 (85.71%), followed by 8 in the range of 30.39 (9.52%), and 3 in the range of 40+ (3.57%). One participant (1.19%) declined to select an age range. The sample population is comprised of participants from each of the target institution's four programmes: 30 from primary/junior (P/J) (35.71%), 10 from junior/intermediate (J/I) (11.90%), 10 from intermediate/senior (I/S) (11.90%), and 34 from Concurrent (40.48%).

Table 1
Participant Demographic Overview

Variable	Category	Frequency (n)	Percent (%)
Gender	Female	73	86.90
	Male	11	13.09
Age Bracket	20-29	72	85.71
	30-39	8	9.52
	40+	3	3.57
	Unanswered	1	1.19
Programme	Primary/Junior (P/J)	30	35.71
	Junior/Intermediate (J/I)	10	11.90
	Intermediate/Senior (I/S)	10	11.90
	Concurrent	34	40.48

4.1.2 Ability and Use of ICTs

Table 2a presents participants' self-rated ability using ICTs to access content on the Internet. The categories range from "I can use technology without assistance whenever I need to," to "I cannot use technology without assistance." However, only two options were selected by 100% of the sample population: 68 participants (80.95%) believe that they can use technology without assistance whenever they need to, while 16 (19.05%) believe that they need minimal assistance when using technology. Despite the reliance on self-assessment for this question, the results identify a high rate of ability and self-efficacy among participants regarding accessing content on the Internet.

Table 2a
Participants' self-rated ability using ICTs to access content on the Internet

Variable	Category	Frequency (n)	Percent (%)
Ability using ICTs to access content on the Internet	I can use technology without assistance whenever I need to.	68	80.95
	I need minimal assistance when using technology.	16	19.05
	I need a lot of assistance when using technology.	0	0.00
	I cannot use technology without assistance.	0	0.00

Table 2b is a crosstabulation between participants' self-rated ICT ability to access content on the Internet (Table 2a) and the demographic overview (Table 1). This table is useful in examining self-rated participants' ICT ability according to gender, age bracket, and programme. Due to the small size of the sample population, it is not intended for any correlation to be drawn between gender, age-bracket, and/or programme for the purposes of examining digital divides or for determining levels of proficiency or self-efficacy.

For gender, 60 females (71.43%) and 8 males (9.52%) responded that they can use ICTs to access content on the Internet without assistance; while 13 females (15.48%) and 3 males (3.57%) indicated that they require minimal assistance. Within age brackets, 58

participants aged 20-29 (69.05%), 7 aged 30-39 (8.33%), 2 aged 40+ (2.38%), and 1

unspecified age (1.19%) indicated that they could use ICTs to access content on the Internet

without assistance; while 14 aged 20-29 (16.67%), 1 aged 30-39 (1.19%), and 1 aged 40+

(1.19%) indicated that they can use ICTs to access content on the Internet with minimal

assistance. Across the four programmes, 27 P/J (32.14%), 8 J/I (9.52%), 8 I/S (9.52%), and

25 Concurrent (29.76%) participants indicated that they can use ICTs to access content on the

Internet without assistance; while 3 P/J (3.57%), 2 J/I (2.38%), 2 I/S (2.38%), and 9

Concurrent (10.71%) participants indicated that they require minimal assistance.

Table 2b
*Participants' self-rated ICT ability * Demographic information Crosstabulation*

Variable	Category	Self-rated ability using ICTs to access content on the Internet					
		Can use ICTs without assistance		Can use ICTs with minimal assistance		Total	
		n	%	n	%	n	%
Gender	Female	60	71.43	13	15.48	**73**	**86.90**
[n = 84]	Male	8	9.52	3	3.57	**11**	**13.10**
Age Bracket	20-29	58	69.05	14	16.67	**72**	**85.71**
[n = 84]	30-39	7	8.33	1	1.19	**8**	**9.52**
	40+	2	2.38	1	1.19	**3**	**3.57**
	Unanswered	1	1.19	0	0.00	**1**	**1.19**
Programme **[n = 84]**	Primary/ Junior (P/J)	27	32.14	3	3.57	**30**	**35.71**
	Junior/ Intermediate (J/I)	8	9.52	2	2.38	**10**	**11.90**
	Intermediate/ Senior (I/S)	8	9.52	2	2.38	**10**	**11.90**
	Concurrent	25	29.76	9	10.71	**34**	**40.48**

Table 2c presents participants' frequency of ICT and Internet use for school. All

teacher candidates enrolled at the target institution were expected to use the Internet for

courses and assignments, so the format of an online survey was not exclusionary and the

responses did not include a category for the absence of ICT and Internet use. Out of 84

responses, 83 participants (98.81%) indicated that they use ICTs and the Internet for school at

least daily. Sixty (71.43%) reported that they use ICTs and the Internet more than three times

a day for school.

Table 2c
Participants' frequency of ICT and Internet use for school

Variable	Category	Frequency (n)	Percent (%)
For school, how often do you use the Internet for information and communication purposes?	>3 times/day	60	71.43
	3 times/day	9	10.71
	Daily	14	16.67
	Weekly	1	1.19
	Monthly	0	0.00

Table 2d is a crosstabulation between participants' frequency of ICT and Internet use

for school (Table 2c) and the demographic overview (Table 1). This table is useful in

examining the frequency of participant use of ICTs and the Internet for school according to

gender, age bracket, and programme. It is not intended for any correlations between gender,

age-bracket, and/or programme to be made for the purposes of examining digital divides or

for determining time spent on school work.

For gender, 55 females (65.48%) and 5 males (5.95%) responded that they use ICTs

and the Internet for school more than three times per day; 5 females (5.95%) and 4 males

(4.76%) use ICTs and the Internet for school three times a day; 12 females (14.29%) and 2

males (2.38%) use ICTs and the Internet for school daily; and 1 female (1.19%) uses ICTs

and the Internet for school weekly.

Within age brackets, 54 participants aged 20-29 (64.29%), 2 aged 30-39 (2.38%), 3

aged 40+ (3.57%), and 1 unspecified age (1.19%) use ICTs and the Internet for school

purposes more than three times per day; while 8 aged 20-29 (9.52%) and 1 aged 30-39

(1.19%) use ICTs and the Internet for school three times a day; 10 aged 20-29 (11.90%) and 4 aged 30-39 (4.76%) use ICTs and the Internet daily; and 1 aged 30-39 (1.19%) use ICTs and the Internet for school weekly.

Across the four programmes, 20 P/J (23.81%), 5 J/I (5.95%), 8 I/S (8.33%), and 28 Concurrent (33.33%) participants use ICTs and the Internet for school more than three times per day; while 3 P/J (3.57%), 2 J/I (2.38%), 1 I/S (1.19%), and 3 Concurrent (3.57%) participants use ICTs and the Internet for school three times per day; 7 P/J (8.33%), 2 J/I (2.38%), 2 I/S (2.38%), and 3 Concurrent (3.57%) use ICTs and the Internet for school daily; and 1 J/I participant (1.19%) uses ICTs and the Internet for school weekly.

Table 2d
Participants' frequency of ICT and Internet use for school * Demographic information Crosstabulation

Variable	Category	Frequency of ICT and Internet use for school									
		>3 times/ day		3 times/ day		Daily		Weekly		Total	
		n	%	n	%	n	%	n	%	n	%
Gender	Female	55	65.48	5	5.95	12	14.29	1	1.19	73	86.90
[n = 84]	Male	5	5.95	4	4.76	2	2.38	0	0.00	11	13.10
Age Bracket	20-29	54	64.29	8	9.52	10	11.90	0	0.00	72	85.71
	30-39	2	2.38	1	1.19	4	4.76	1	1.19	8	9.52
[n = 84]	40+	3	3.57	0	0.00	0	0.00	0	0.00	3	3.57
	Unanswered	1	1.19	0	0.00	0	0.00	0	0.00	1	1.19
	Primary/ Junior (P/J)	20	23.81	3	3.57	7	8.33	0	0.00	30	35.71
Programme [n = 84]	Junior/ Intermediate (J/I)	5	5.95	2	2.38	2	2.38	1	1.19	10	11.90
	Intermediate/ Senior (I/S)	7	8.33	1	1.19	2	2.38	0	0.00	10	11.90
	Concurrent	28	33.33	3	3.57	3	3.57	0	0.00	34	40.78

Table 2e presents participants' use of ICTs and the Internet outside of school. Eighty-three participants (98.81%) indicated that they use ICTs and the Internet outside of school at

least daily. The largest majority, with 64 responses (76.19%), uses ICTs and the Internet

outside of school work more than three times per day; the second largest group, with 17

responses (20.24%) uses them daily. One participant (1.19%) chose not to respond.

Table 2e
Participants' frequency of ICT and Internet use outside of school

Variable	Category	Frequency (n)	Percent (%)
Outside of school work, how often do you use the Internet for information and communication purposes?	>3 times/day	64	76.19
	3 times/day	2	2.38
	Daily	17	20.24
	Weekly	0	0.00
	Monthly	0	0.00
	Never	0	0.00
	Unanswered	1	1.19

Table 2f is a crosstabulation between participants' frequency of ICT and Internet use

outside of school (Table 2e) and the demographic overview (Table 1). This table is useful in

examining the frequency of participant use of ICTs and the Internet outside of school

according to gender, age bracket, and programme. However, due to the small size of the

sample population, it is not intended for any correlations between gender, age-bracket, and/or

programme to be made for the purposes of examining digital divides or for determining how

leisure time is spent.

For gender, 53 females (63.10%) and 11 males (13.10%) responded that they use

ICTs and the Internet outside of school more than three times per day; 2 females (2.38%) use

ICTs and the Internet outside of school three times a day; 17 females (20.24%) use ICTs and

the Internet outside of school daily; and 1 female (1.19%) declined to answer.

Within age brackets, 58 participants aged 20-29 (69.05%), 4 aged 30-39 (4.76%), and

2 aged 40+ (2.38%) use ICTs and the Internet outside of school more than three times per

day; while 1 aged 20-29 (1.19%) and 1 unspecified age (1.19%) use ICTs and the Internet

outside of school three times a day; 12 aged 20-29 (14.29%), 4 aged 30-39 (4.76%), and 1

aged 40+ (1.19%) use ICTs and the Internet daily; and 1 participant aged 20-29 (1.19%)

declined to answer.

Across the four programmes, 21 P/J (25.00%), 8 J/I (9.52%), 9 I/S (10.71%), and 26

Concurrent (30.95%) participants use ICTs and the Internet outside of school more than three

times per day; while 1 P/J (1.19%) and 1 Concurrent (1.19%) participant use ICTs and the

Internet for school three times per day; 8 P/J (9.52%), 2 J/I (2.38%), 1 I/S (1.19%), and 6

Concurrent (7.14%) participants use ICTs and the Internet outside of school daily; and 1

Concurrent (1.19%) participant opted not to answer.

Table 2f
*Participants' frequency of ICT and Internet use outside of school * Demographic information
Crosstabulation*

Variable	Category	Frequency of ICT and Internet use outside of school									
		>3 times/ day		3 times/ day		Daily		Unspecified		Total	
		n	%	n	%	n	%	n	%	n	%
Gender	Female	53	63.10	2	2.38	17	20.24	1	1.19	**73**	**86.90**
[n = 84]	Male	11	13.10	0	0.00	0	0.00	0	0.00	**11**	**13.10**
Age Bracket [n = 84]	20-29	58	69.05	1	1.19	12	14.29	1	1.19	**72**	**85.71**
	30-39	4	4.76	0	0.00	4	4.76	0	0.00	**8**	**9.52**
	40+	2	2.38	0	0.00	1	1.19	0	0.00	**3**	**3.57**
	Unanswered	0	0.00	1	1.19	0	0.00	0	0.00	**1**	**1.19**
Programme [n = 84]	Primary/ Junior (P/J)	21	25.00	1	1.19	8	9.52	0	0.00	**30**	**35.71**
	Junior/ Intermediate (J/I)	8	9.52	0	0.00	2	2.38	0	0.00	**10**	**11.90**
	Intermediate/ Senior (I/S)	9	10.71	0	0.00	1	1.19	0	0.00	**10**	**11.90**
	Concurrent	26	30.95	1	1.19	6	7.14	1	1.19	**34**	**40.48**

Table 2g presents participants' use of ICT devices to access the Internet. Participants

were asked "If you access the Internet, what device(s) do you use?" and were instructed to

select all the options that apply. The top two ICT devices participants use to access the

Internet are computer/laptop with 82 responses (97.62%) and Smart phone with 78 (92.86%)

responses.

Table 2g
Participants' use of devices to access the Internet

Variable	Category	Frequency (n)	Percent (%)
What devices do you use to access the Internet? [n = 84]	Computer/laptop	82	97.62
	Tablet (including e-readers)	32	38.10
	Smart phone	78	92.86
	Gaming console	10	11.90
	MP3 player	2	2.38
	Other	0	0.00

Note. Participants were instructed to select all options that apply.

Table 2h presents participants' use of the Internet. Participants were asked "When you

access the Internet, what do you use it for?" and then instructed to select all the options that

apply. All 84 participants (100.00%) indicated that they use the Internet for information

retrieval (such as looking up information and/or accessing media); whereas 46 (54.76%) use

it for information dissemination (such as creating, uploading, or contributing information).

For communication, 83 participants (98.81%) use the Internet to send and receive email, 68

(80.95%) use it for text-based chat, and 39 (46.43%) use it for audio/video chat. For

entertainment and leisure, 76 (90.48%) participants use the Internet for accessing social

networking sites, 67 (79.76%) use it to browse and/or purchase merchandise, and 32

(38.10%) use it to play games. A final option for "Other" was provided and included a

comment box. One participant (1.19%) indicated the "Other" option and input: "Applications

that assist with organization" (Participant 2h-1).

Table 2h
Participants' use of the Internet

Variable	Category	Frequency (n)	Percent (%)
When you access the Internet, what do you use it for? **[n = 84]**	Retrieve information (look up information, access media such as images, videos, music, software)	84	100.00
	Disseminate information (create, upload, or contribute information such as images, videos, music, software)	46	54.76
	Send/receive email	83	98.81
	Audio/video chat	39	46.43
	Text chat	68	80.95
	Access social networking sites	76	90.48
	Browse/purchase merchandise	67	79.76
	Play games	32	38.10
	Other*	1	1.19

Note. Participants were instructed to select all options that apply.
*"Applications that assist with organization." (Participant 2h-1)

4.1.3 Perceptions of e-Literacy

Prior to engaging twelve Likert scale questions, participants were asked to read a definition of e-literacy that outlined the responsible use of ICTs through the four domains of capability, critical thinking, citizenry, and safety. The Likert scale questions included statements designed to gauge participant opinion on e-literacy in education. The statements were presented using either positive or negative language to prevent authorial bias from influencing participant selections. Each question also had an optional comment box for participants to provide comments or additional insight on their selections. This allowed for qualitative data to be collected alongside of quantitative data.

Table 3a presents responses from 84 participants for the statement: *e-literacy should be included in K-12 education*. The majority of participants, with 44 responses (52.38%) strongly agreed with the statement, followed by 34 (40.48%) who agreed, resulting in 78 (92.86%) of participants being for the statement. One participant (1.19%) declined to provide

a response.

The statement prompted participants to comment on two major themes. The first theme is on the responsible use of technology in education. Participant 3a-12 wrote,

Children are accessing the Internet and a wide variety of forms of communication at an increasingly younger age. I feel that it would be appropriate to begin e-Literacy training alongside of computer use. When the Ministry of Education [of Ontario] or school-board feels that it is appropriate to have students using computers and other forms of technology, it is then when e-Literacy should be required as well.

Participant 3a-19 stated, "Most primary students are introduced to devices that can bring them to the internet, so students should have a background that not only teaches them how to access the internet and technology, but how to use it appropriately and safely."

The second theme found in the comments reflected the e-literacy domain of citizenry with regards to preparing students for life in society. Participant 3a-20 noted, "With the technological advances in society, it is necessary to include e-Literacy in the K-12 education as children will be surrounded by [ICTs] their entire lives." Participant 3a-9 highlighted both themes:

The world has undergone a radical change in the past 20 years in the way of communication. People have become fast-paced digital entities who heavily rely on the wide world web to do all sorts of daily activities. Teaching e-Literacy is of extreme importance in the 21st century in order to shape responsible and conscious [*sic*] students. Students are now constantly accessing different devices and surfing the internet for a plethora of reasons. Therefore, teachers must incorporate e-Literacy in their educational programs. Preparing students to be fully functional individuals in the 21st century, e-Literacy has to be ingrained in their classes.

The comments provided by these participants identify the recognition that e-literacy

instruction is important in 21st century education and contributes to preparing students for the challenges of the future.

Table 3a
Participants' perceptions of e-literacy in education

Statement	Response	Frequency (n)	Percent (%)
e-Literacy should be included in K-12 education. **[n = 84]**	Strongly Disagree	3	3.57
	Disagree	2	2.38
	Unsure	0	0.00
	Agree	34	40.48
	Strongly Agree	44	52.38
	Unanswered	1	1.19

Table 3b presents responses from 84 participants for the statement: *Parents should have the primary responsibility of teaching e-literacy skills to children*. The highest response from participants, with 37 (44.05%) disagreed with the statement, followed by 23 (27.38%) who agreed, and 21 (25.00%) who were unsure. The results show that participants are relatively divided on the statement.

This division is better understood through the comments provided by participants. For example, some participants responded by noting the importance of partnerships between home and school. Participant 3b-30 wrote, "I think it is important for both parents and teachers to teach e-literacy skills to children," and Participant 3b-31 stated, "It has to be a joint effort between the classroom teacher and the parent[s]." Participant 3b-29 expanded on this relationship:

> Although parents should place emphasis on e-Literacy within their child's home
> environment, I believe that in today's society, the responsibility of teaching these
> skills should be shared between the child's parents and educators due to the recent
> technological advancements.

Conversely, Participant 3b-1 wrote that "not all parents do" with regards to teaching their children about e-literacy, while Participant 3b-8 pointed out that "Parents may lack the

required literacy themselves." Participant 3b-2 stated, "I agree that parents have a responsibility in what their children do with technology; however, teachers are more current with the issues and either need to teach these skills to students or make the parents aware of them." Participant 3b-10 wrote,

> Parents play a role, but many are ill-equipped to truly teach their children about e-literacy, either because they don't know what it is, they do not use ICT[s] enough, they're uncomfortable teaching it, or because they wouldn't know how to approach and teach it.

These comments represent concerns that not all parents are responsible users, highlighting the reality that 21st century Canadian society is still early in the stages of developing and proliferating responsible use of technology theory and practice among all ages of its citizenry.

Participant 3b-21 presented an interesting comment, "If taught in school, all children have equal opportunities to learn." This statement speaks to the ideal that democratic education in Canada is theoretically for all, yet in practice, education may not be equal nor equitable for all. This reality has historically contributed to divides (both digital and otherwise) as well as oppressive and exclusionary models, such as the residential schools and segregated schools.

Participant 3b-27 wrote, "We cannot assume that all adults/parents understand e-literacy. Therefore, we cannot ask them to teach their children something they may not know or understand." If we cannot assume that all parents are capable, knowledgeable, and willing to teach about the responsible use of technology to children, then society must rely on the social institution of education to fill this gap.

Table 3b
Participants' perceptions of e-literacy in education (cont.)

Statement	Response	Frequency (n)	Percent (%)
Parents should have the primary responsibility of teaching e-literacy skills to children. **[n = 84]**	Strongly Disagree	1	1.19
	Disagree	37	44.05
	Unsure	21	25.00
	Agree	23	27.38
	Strongly Agree	2	2.38
	Unanswered	0	0.00

Table 3c presents responses from 84 participants for the statement: *It is the responsibility of K-12 teachers to understand, practice, and model the responsible use of ICTs to students*. The majority of participants, with 44 responses (52.38%) strongly agreed with the statement, followed by 34 (40.48%) who agreed, resulting in 78 (92.86%) of participants being for the statement.

The main theme that participants commented on was the importance of teachers modeling the responsible use of ICTs to students. Participant 3c-2 wrote, "Students learn through a modelling method, which is important for students to see that even teachers practice what they teach." However, modeling responsible use is not a simple task. Participant 3c-5 stated,

The onus can't always fall on one party, but teachers do play a large role in teaching and modeling behaviours. The problem is that there are a lot of teachers who, like parents, may not be comfortable with ICT and therefore find it more difficult [to] teach. This is only a vague and ill-addressed topic in teacher education programs.

Similarly, Participant 3c-9 indicated similar concerns,

As teachers, we need to continue to grow, and one way in which we especially need to grow is in that of technology use within the classroom. We are the best people to role-model and teach the use of technology. However, in order to do so, we need to get over our fears of ineptitude and take on the responsibility of ICTs for our students.

Participant 3c-7 identified a possible solution to the concerns above, stating

> I believe that the ministry [of education in Ontario] must entrench this responsibility
>
> into the curriculum and make it part of the educational programs[…]. Teachers
>
> should understand, practice and model the responsible use of ICTs to students
>
> because otherwise nobody will.

Table 3c

Participants' perceptions of e-literacy in education (cont.)

Statement	Response	Frequency (n)	Percent (%)
It is the responsibility of K-12 teachers to understand, practice, and model the responsible use of ICTs to students. [n = 84]	Strongly Disagree	3	3.57
	Disagree	0	0.00
	Unsure	3	3.57
	Agree	34	40.48
	Strongly Agree	44	52.38
	Unanswered	0	0.00

Table 3d presents responses from 84 participants for the statement: *e-Literacy curriculum is best integrated through cross-curricular and interdisciplinary methods, instead of as its own subject*. The highest response from participants was tied, with 37 (44.05%) indicating they strongly agreed and 37 responses (44.05%) indicating they agreed with the statement. The result is that 74 (88.10%) of participants are for the statement. One participant (1.19%) declined to provide a response.

Participants provided further insight on this statement through their comments. Participant 3d-10 wrote, "There is already so much teachers are responsible for from the curriculum, they don't need a whole new subject to teach when it can just as easily be integrated and therefore more authentically taught." Participant 3d-1 noted that "students will be using e-literacy to research a variety of subjects. Incorporating it off the hop allows for them to get the correct perspective of how it can be used." Participant 3d-7 stated,

> Considering the lack of time for the school subjects already within the curricula, such
>
> as Health and Physical Education and the Arts, I feel that e-Literacy should be

integrated through cross-curricular methods. This would allow students to experience

e-Literacy through continuous and practical application instead of theory, which

would create a better understanding.

Table 3d
Participants' perceptions of e-literacy in education (cont.)

Statement	Response	Frequency (n)	Percent (%)
e-Literacy curriculum is best integrated through cross-curricular and interdisciplinary methods, instead of as its own subject. **[n = 84]**	Strongly Disagree	1	1.19
	Disagree	4	4.76
	Unsure	4	4.76
	Agree	37	44.05
	Strongly Agree	37	44.05
	Unanswered	1	1.19

Table 3e presents responses from 84 participants for the statement: *If schools do not have access to a wide range of ICTs, they should not have to teach about e-literacy*. The majority of participants, with 42 responses (50.00%) disagreed with the statement, followed by 29 (34.52%) who strongly disagreed, resulting in 71 (84.52%) of participants being against the statement. It is also worth noting that 10 participants (11.90%) indicated that they were unsure and 1 (1.19%) declined to provide a response.

On this statement, several participants provided insight to their responses. Participant 3e-6 wrote, "Just because schools don't have [ICTs], it doesn't mean students don't or that students won't have access to them in the future." Participant 3e-3 noted, "Even with minimal access, students should still learn about e-literacy because they will encounter [technology] throughout their lives." Participant 3e-4 wrote, "Almost everyone has access to internet these days, so teachers should cover topics like internet safety, and how to analyze information on the web." Despite potential funding issues within school boards, most participants indicated that e-literacy instruction should be provided regardless of the presence/absence of ICTs in schools.

Table 3e
Participants' perceptions of e-literacy in education (cont.)

Statement	Response	Frequency (n)	Percent (%)
If schools do not have access to a wide range of ICTs, they should not have to teach about e-literacy. **[n = 84]**	Strongly Disagree	29	34.52
	Disagree	42	50.00
	Unsure	10	11.90
	Agree	1	1.19
	Strongly Agree	1	1.19
	Unanswered	1	1.19

Table 3f presents responses from 84 participants for the statement: *e-Literacy should be included in the on-going professional development of in-service teachers (teachers currently employed)*. The majority of participants, with 50 responses (59.52%) strongly agreed with the statement, followed by 30 (35.71%) who agreed, resulting in 80 (95.24%) of participants being for the statement. One participant (1.19%) declined to provide an answer.

While this statement addresses contexts beyond the programme that participants were enrolled in, professional development is something that teacher candidates will encounter throughout their careers in education. Participants provided additional information on the statement, such as "and those not employed should continue learning and keeping up to date" (Participant 3f-1). Others offered insight on the statement, such as "This will keep teachers current and relatable to their 21st century learners" (Participant 3f-3), "Teachers need to be at the very least on par with the global situation" (Participant 3f-4), and "This will improve the ability and quality of the teachers who are unsure of how to use technology correctly in the classroom" (Participant 3f-8).

Participant 3f-6 expressed concern, stating "Sometimes we don't know where to go or who to ask for help with things like this." Participant 3f-5 offered insight to the bigger picture of professional development (PD):

There are teachers who don't use ICT very often and therefore may not be comfortable teaching e-literacy or really know what e-literacy is about. The problem

is that many teachers complain that professional development days are often useless and a waste of time. If e-literacy is included in ongoing PD, this needs to be taken into consideration so that there is value to including it and teachers actually benefit.

Table 3f
Participants' perceptions of e-literacy in education (cont.)

Statement	Response	Frequency (n)	Percent (%)
e-Literacy should be included in the on-going professional development of in-service teachers (teachers currently employed). **[n = 84]**	Strongly Disagree	0	0.00
	Disagree	3	3.57
	Unsure	0	0.00
	Agree	30	35.71
	Strongly Agree	50	59.52
	Unanswered	1	1.19

Table 3g presents responses from 84 participants for the statement: *Teacher education institutions should be responsible for developing proactive policy aimed at integrating e-literacy into teacher education*. The majority of participants, with 44 responses (52.38%) agreed with the statement, followed by 34 (40.48%) who strongly agreed, resulting in 78 (92.86%) of participants being for the statement.

Participants offered a limited but interesting amount of feedback to this statement. Participant 3g-1 wrote, "it is in the curriculum (media literacy) so teachers should have the resources and ability to implement it." Participant 3g-2 stated,

> This should come from OCT and teacher education programs should determine the most effective and appropriate ways to incorporate it into their faculties. If it doesn't come from OCT then there's no standardization or consistency among programs, and therefore among teachers or education (well, less consistency than there is currently).

Another participant reflected on their own context and wrote, "Considering we taught ourselves and did not have a professor address this at all. I say we would have benefited from learning how [to] do this before we left for a career" (Participant 3g-3). Lastly, Participant 3g-4 admitted "I don't really know whose responsibility this is."

Table 3g
Participants' perceptions of e-literacy in education (cont.)

Statement	Response	Frequency (n)	Percent (%)
Teacher education institutions should be responsible for developing proactive policy aimed at integrating e-literacy into teacher education. **[n = 84]**	Strongly Disagree	0	0.00
	Disagree	2	2.38
	Unsure	4	4.76
	Agree	44	52.38
	Strongly Agree	34	40.48
	Unanswered	0	0.00

Table 3h presents responses from 84 participants for the statement: *It is important for teacher candidates (Bachelor of Education students) to learn about e-literacy in teacher education programmes*. The majority of participants, with 48 responses (57.14%) strongly agreed with the statement, followed by 33 (39.29%) who agreed, resulting in 81 (96.43%) of participants being for the statement.

Three comments were of particular interest. Participant 3h-4 wrote, "Since it is a part of being an educator, teacher candidates NEED to be taught how to implement that method of teaching." Participant 3h-5 noted

> I think that we need to have an effective "technology" course where we learn what are the best methods of ICT[s]. The professor should be providing us [with] the tools for us to be successful in the classroom. It would even be helpful for the professor to highlight some important websites and show us how to navigate them…

Lastly, Participant 3h-1 reflected on how this affects their career, stating "It is the hot-topic in 21st century learning, which we will need to know when getting hired."

Table 3h
Participants' perceptions of e-literacy in education (cont.)

Statement	Response	Frequency (n)	Percent (%)
It is important for teacher candidates (Bachelor of Education students) to learn about e-literacy in teacher education programmes. **[n = 84]**	Strongly Disagree	1	1.19
	Disagree	2	2.38
	Unsure	0	0.00
	Agree	33	39.29
	Strongly Agree	48	57.14
	Unanswered	0	0.00

Table 3i presents responses from 84 participants for the statement: *It is not necessary for teacher educators (course instructors) to expose teacher candidates to e-literacy pedagogy and practices*. The highest response from participants, with 40 (47.62%) disagreed with the statement, followed by 34 (40.48%) who strongly disagreed, resulting in 74 (88.10%) of participants being against the statement.

This is another statement that generated a range of comments from participants. Participant 3i-6 provided pointed insight by stating, "The best way to learn is to see it done - so show us, please"; and Participant 3i-7 wrote, "I think we need to be educated on what is out there to use, but also how to use it efficiently." A moderate approach was presented by Participant 3i-5, who stated "I think that it is very important for the faculty to teach us everything we need to know even if it is in small amounts. What I mean by this is at least if we know it is out there we can find out more about it if we need to."

On the other hand, some participants expressed frustration with the instruction they had received at the target institution. Participant 3i-3 wrote, "During our time [at the target institution] is the prime time to learn about e-literacy and our professors do not do the proper job. They lack effort and proper teaching methods for it... even our technology professor." This idea is reflected in the comment from Participant 3i-2: "The technology course instructor, [name removed], did none of that. The course was a waste of time, and I was looking forward to that course when the year started." Additionally, Participant 3i-4 stated, "We were not exposed to e-literacy pedagogy and practice too much. The focus [was] more 'here's what it is and how to be aware of it' rather than 'here's what it is and how you can implement it into your teaching practice.'"

Table 3i
Participants' perceptions of e-literacy in education (cont.)

Statement	Response	Frequency (n)	Percent (%)
It is not necessary for teacher educators (course instructors) to expose teacher candidates to e-literacy pedagogy and practices. **[n = 84]**	Strongly Disagree	34	40.48
	Disagree	40	47.62
	Unsure	7	8.33
	Agree	1	1.19
	Strongly Agree	2	2.38
	Unanswered	0	0.00

Table 3j presents responses from 84 participants for the statement: *Teacher education institutions should be required to equip teacher candidates with not just e-literacy theory, but e-literacy pedagogy as well*. The highest response from participants, with 40 (47.62%) agreed with the statement, followed by 34 (40.48%) who strongly agreed, resulting in 74 (88.10%) of participants being for the statement.

This statement generated few responses from participants. Participant 3j-1 wrote, "theory is important, but pedagogy is what's going to be useful in the classroom and that's where the focus should be. Participant 3j-2 offered a similar opinion, "Theory does little, while practice does mass amounts. This is why we use placements to teach the teacher candidates, instead of wholly in-class theory."

Table 3j
Participants' perceptions of e-literacy in education (cont.)

Statement	Response	Frequency (n)	Percent (%)
Teacher education institutions should be required to equip teacher candidates with not just e-literacy theory, but e-literacy pedagogy as well. **[n = 84]**	Strongly Disagree	2	2.38
	Disagree	1	1.19
	Unsure	7	8.33
	Agree	40	47.62
	Strongly Agree	34	40.48
	Unanswered	0	0.00

Table 3k presents responses from 84 participants for the statement: *I feel that the teacher education programme at the [target institution] adequately addresses my e-literacy needs*. The majority of participants, with 45 responses (53.57%) disagreed with the statement,

followed by 28 (33.33%) who strongly disagreed, resulting in 73 (86.90%) of participants being against the statement.

While all teacher candidates at the target institution are required to have an instructional technology course, some of the participants from the Concurrent programme may not have received instruction in this course yet, despite completing at least two out of five years. The term e-literacy was defined and used throughout the online survey questionnaire to represent theory and practice on the responsible use of technology. Please note that some responses focus on the actual presence/absence of the term "e-literacy," while others speak to the presence/absence of instruction on "the responsible use of technology."

The comments offered by participants were critical but constructive, and some were geared toward the instructional class, while others were directed at the programme. For example, Participant 3k-2 wrote,

> I feel that i'm [*sic*] equipped to teach e-literacy to students, but because of my comfort with ICT and because of skills that I learned throughout my B.Sc. undergraduate degree, not my B.Ed. degree. I don't recall learning about implementing e-literacy during class. This should have been more adequately addressed in (at least) teachable classes, Law & Ethics, and Instructional Technology.

Participant 3k-5 offered,

> While I have been exposed to a few new programs and things that I may well use in the classroom, for the most part, I have felt that a course on the use of technology in the classroom (e-Literacy) would be a very useful tool.

Participant 3k-3 noted, "We taught ourselves by researching an area and then presenting the material to our classmates," while Participant 3k-10 echoed, "All we did was research and present on websites geared towards helping teachers." Participant 3k-8 commented,

> Although a variety of ICTs have been used throughout our courses at the [target

institution], I have received more exposure to educational teaching tools related to ICTs out in the field throughout my practicum experiences. In addition, I was unaware of the principles of e-Literacy in an in-depth manner until completing this survey questionnaire. If the use of ICTs and the four [domains] of e-Literacy in schools can only benefit today's students throughout their lifetime, I don't see any reason why our courses at the [institution] shouldn't emphasize these ideas as well."

Table 3k
Participants' perceptions of e-literacy in education (cont.)

Statement	Response	Frequency (n)	Percent (%)
I feel that the teacher education programme at the [target institution] adequately addresses my e-literacy needs. [n = 84]	Strongly Disagree	28	33.33
	Disagree	45	53.57
	Unsure	8	9.52
	Agree	2	2.38
	Strongly Agree	1	1.19
	Unanswered	0	0.00

4.1.4 e-Literacy Instruction and Assessment

Multiple choice questions were employed to gauge participant experiences on instruction and assessment related to e-literacy in teacher education at the target institution. Some questions also offered an optional comment box for participants to elaborate on their choices. The quantitative and qualitative nature of the data allowed for a deeper analysis into the lived experiences of the participants.

Table 4a presents responses from 84 participants who were asked: *If you have completed or are currently taking either technology course, did it provide any instruction on e-literacy theory and/or practice?* The responses totaled 11 (13.10%) for "Yes," and 39 (46.43%) for "No." The other 34 participants had not yet taken a technology course.

The comments provided by participants focused on two areas: course content and instruction. Participant 4a-3 wrote, "The term e-literacy was not used in this course," which was similar to Participant 4a-8's comment, "The technology course I took at the faculty was

106

self-taught and did not provide any instruction on e-literacy theory." Participant 4a-5

expanded further: "This course didn't provide much information on anything, but definitely

not on e-literacy practice. I'm more interested in learning about how to implement technology

and e-literacy into the classroom not learning about what a particular software can do."

Participant 4a-2 qualified an affirmative answer, stating "Yes, however, the course

was taught by students throughout the year so we taught ourselves and shared websites and

resources we found with each other. There was not too much information shared from the

professor." This sentiment is echoed by other participants. Participant 4a-1 wrote:

> The actual technology course taken was essentially a section of students presenting
>
> the resources that they have come across and have used [o]n placement or found.
>
> [There] was no instruction, just group presentation. So how is a student who is new
>
> into the field suppose[d] to teach other students about a topic that they have not been
>
> informed on? The irony of an education course instilling poor teaching practices was
>
> ridiculous.

Participant 4a-4 noted:

> There was no instruction. The professor never taught, but instead had all the students
>
> present. The feedback from the professor offered no insight into the technology but
>
> instead commented on our presentation abilities. Many students were unfamiliar with
>
> the technology they were presenting on and the professor offered no clarification on
>
> how to use it, or if it was being implemented to it's [*sic*] full potential.

On the other hand, Participant 4a-11 indicated that the domain of safety was

encountered: "[T]his course was student directed and therefore the topics we learned

depended on whether or not student presenters chose this topic as a[n] ISU. [O]ne group did

choose to discuss an article about internet safety." Participant 4a-12 recognized, "Although

we did learn some things about e-literacy we did not learn nearly as much as we could have

or should have. I am thankful that my section was so amazing at sharing resources or all of our placements would have been extremely different if we had to just rely on the technology course that we had to take."

Table 4a
Participants' perceptions of e-literacy instruction and assessment

Variable	Category	Frequency (n)	Percent (%)
If you have completed or are currently taking either technology course, did it provide any instruction on e-literacy theory and/or practice?	Yes	11	13.10
	No	39	46.43
	I have not taken either of [the technology] courses.	34	40.48

Table 4b presents responses from 84 participants who were asked: *In practicum formative and summative assessment reports, the "Teaching Practice" section measures a Teacher Candidate's ability to "Use technology effectively." Do you think this measurement reflects the needs of Teacher Candidates with respect to e-literacy?* The responses totaled 21 (25.00%) for "Yes," and 62 (73.81%) for "No." One participant (1.19%) declined to respond.

The comments provided by participants reflected their experiences with assessment of technology on their placements in K-12 classrooms. On the shortcomings of the assessment process, Participant 4b-4 wrote, "Associates interpret this as whether or not you can use a computer effectively," while Participant 4b-2 related:

> I was told to use technology to get a 'check' on this part of the assessment. It was hypocritical of some associates who told me in my reports that I was to use more technology in the classroom, when the most technological thing they use is [*sic*] transparencies.

On the inadequacy of the assessment tool, Participant 4b-1 noted, "What was not taken into [account] is the variety of technology or lack of technology." Participant 4b-8 provided further insight with the statement: "Simply because teacher candidates need to show that they

can use technology effectively, does not mean that they are required to show how they can

teach students e-literacy."

Table 4b
Participants' perceptions of e-literacy instruction and assessment (cont.)

Variable	Category	Frequency (n)	Percent (%)
In practicum formative and summative assessment reports, the "Teaching Practice" section measures a Teacher Candidate's ability to "Use technology effectively." Do you think this measurement reflects the needs of Teacher Candidates with respect to e-literacy?	Yes	21	25.00
	No	62	73.81
	Unanswered	1	1.19

Table 4c presents responses from 84 participants who were asked: *Do you think a*

teacher education institution should include e-literacy within its curriculum? The responses

totaled 82 (97.62%) for "Yes," and 2 (2.38%) for "No." There was no optional comment box

offered for this question and thus, no qualitative comments are available for additional

analysis.

Table 4c
Participants' perceptions of e-literacy instruction and assessment (cont.)

Variable	Category	Frequency (n)	Percent (%)
Do you think a teacher education institution should include e-literacy within its curriculum?	Yes	82	97.62
	No	2	2.38
	Unanswered	0	0.00

Table 4d presents responses from 84 participants who were asked: *Do you think that*

proficiency with e-literacy should be included in practicum assessment requirements? The

responses totaled 61 (72.62%) for "Yes," and 22 (26.19%) for "No." One participant (1.19%)

opted not to respond.

Two comments were of particular note and focused on assessment. Participant 4d-5

wrote, "proficiency should not be assessed if the [target institution] does not have professors that are going to instruct adequately. It's unfair to students who are not familiar with the technologies to be assessed if they were not taught how to use the technology in their program." Participant 4d-6 wrote, "associates can't assess this in 3 weeks, and it would therefore be a superficial and unfair assessment. Furthermore, not every subject and every topic within that subject will necessarily address e-literacy."

Table 4d
Participants' perceptions of e-literacy instruction and assessment (cont.)

Variable	Category	Frequency (n)	Percent (%)
Do you think that proficiency with e-literacy should be included in practicum assessment requirements?	Yes	61	72.62
	No	22	26.19
	Unanswered	1	1.19

4.2 Focus Group Discussions

The purpose of the focus group discussions was to gain a deeper insight and understanding into the lived experiences of teacher candidate participants from the target institution. Participants were recruited through a series of emails that provided them with a schedule of the focus group discussions. The focus group discussions were held within the target institution facilities with the approval of the Research Ethics Board and the dean.

Two focus group discussions were held with a total of eight participants. Demographic information for these participants was not collected. All participant input from each group was recorded in audio form and was transcribed as one collective opinion. Comments provided by participants are cited as being from either Group A or Group B. Four main themes emerged from the discussions and are found in sections 4.2.1 – 4.2.4: responsible use of technology; technology in the Bachelor of Education programme; technology on practicum placements; and successes, challenges and possibilities.

4.2.1 Responsible Use of ICTs

The theme of responsible use of ICTs provided participants with opportunities to express opinions and share experiences in discussions centred on e-literacy theory and practice. The topics that emerged from discussions on the responsible use of technology were centred on the domains of capability and safety found in e-literacy.

A statement from Group A helps shed light on the need for of e-literacy in education. Responding to the question "How did you learn to be a responsible user?" Group A stated, "I've learned by doing, for the most part. By other people showing me… Yeah, I rely mostly on friends to help me with that." On one hand, haphazard, trial-and-error methods are not the most effective learning processes, nor are they efficient practices for educating a population on the responsible use of technology. On the other hand, this statement shows that collaboration, a facet of capability, holds incredible potential for education.

Capability.

The idea of a "capability cycle" emerged through a discussion of ICTs that have multidisciplinary applications. Group B noted that on a practicum placement, their students were using a program called IXL to do research and make recordings for math, language arts, and drama assignments. It was discussed that when students are accessing ICTs to learn and create, they are engaging assignments in a process that will result in a product. The experience gained from this "capability cycle" can contribute to an increase in ability and self-efficacy. Additionally, the knowledge and skills developed from this can also be applied to a range of new contexts and ICTs.

The second topic within capability is accessibility. Accessibility leads to greater potential for expectations and practices to be modelled by teachers. Group B pointed out, "having that technology in the classroom is a useful resource because it's not just the one artifact that you're trying to model, you can access everything through an online connection."

Group A shared how cloud-based systems like Google Docs provide synchronous and asynchronous access to multiple individuals who are working on the project: "It has proved to be very, very useful because we are four individuals who are all on the same level, but we're all crazy busy. So having that instant access and all being able to work on the same thing has been very useful."

The third topic that was discussed was collaboration. One case of how collaboration can aid in teaching and learning was given by Group A, wherein a vice-principal at a school the participant did a placement in was asked to give demonstration lessons to a Grade 4/5 split class because the homeroom teacher was not proficient with the technology. The vice-principal was able to teach the students and the teacher about the technology. This type of collaboration can result in the formation of communities of practice (Lave & Wenger, 1991) that can lead to the development and proliferation of technological capability and proficiency. Another example was described by Group A, who witnessed a student helping a teacher correct an ICT-related problem. This experience prompted the participant to recognize that "it's important to be able and willing to humble yourself and learn from the students as well, because they've got databases of their own knowledge that they bring with them." From these anecdotes, it is clear that teachers need to collaborate with administrators, other teachers, and students in ways that promote communities of practice. These communities of practice, in turn promote the levelling of imbalanced power hierarchies that Freire (2005) warns would lead to banking models of education.

Safety.

Safety within e-literacy takes many forms and applications. For example, Group A voiced a need for more technical safety measures to be integrated into ICT education: "I think it would definitely be a good thing to know more about how computers work, and where viruses come from and how to deal with them once you do have them."

Another concern is over permission and identity protection, which extends to everybody, especially minors:

> If I'm making this video with my class about vegetables or something, maybe we decide to put that on YouTube so that they can show it to their friends and family. Where does being responsible and being protected come into now, putting that into a public domain for other people to use?" (Group A)

To promote identity protection in pictures, Group A added, "One thing we talked about last semester is just taking a picture of [the students'] hands doing things… because hands are not usually identifiable." To address issues of permission, the use of release forms was also discussed within Group A, where it was noted that most schools require parents or guardians to sign an agreement in order for students to be included in media created and used by teachers, administrators, and school staff.

The next topic within safety deals with stranger danger: Danger associated with online interactions need to be mitigated by safe practices. For instance, social media takes many forms and promotes interaction with other individuals in virtual environments. The Tinder application was identified by Group B who noted how it "helps make virtual connections with others where in-person meetings may lead to dangerous situations." However, Group B added that social media opens up users to the danger of being "catfished." According to Urban Dictionary, "catfishing" is "[t]he phenomenon of internet predators [who] fabricate online identities and entire social circles to trick people into emotional/romantic relationships (over a long period of time)" (2013). File sharing also came up in Group B's discussion on stranger danger:

> There are a lot of file sharing sites where you find somebody who has a file that you're looking for. You have to email them personally and wait for their response.… It can be scary too, if you don't actually know them, because what are they sending

you? You don't know the person's intentions or anything.

A common element across these examples of dangers associated with unknown individuals in online environments is the anonymity of their identity – they are strangers, after all. For the sake of personal safety, participants in these focus groups were cognizant of the fact that users of ICTs need to be vigilant when interacting with strangers online.

The final safety topic discussed by participants focused on the dangers associated with devices and content. Group B expressed concern about situations that may arise around personal property being damaged or stolen within schools or classrooms that promote bring your own device (BYOD) policies. Referring to the devices that students bring to school, Group B also noted, "You don't know what's on there…. Their own iPads have whatever they want. They can access the Internet, but on our [devices], they can't." These experiences shared by the participants do not reflect negatively on BYOD policies, rather, they illustrate how ICT safety requires a multipronged approach to achieve the goal of responsible use according to a range of contextual challenges. As schools embrace or begrudgingly accept the role of educating students on Internet safety, Group B insightfully observed that it comes to the question of "how much control do they want to protect themselves, and protect the kids, and protect the parents' stuff?" Through these focus group discussions, it gradually became clear that a moderate path for educational policy on ICT-related safety requires proactive measures and a dynamic balance between freedom and security.

4.2.2 Technology in the Bachelor of Education Programmes

The theme of technology in the Bachelor of Education (B.Ed.) programmes that teacher candidate participants were enrolled in provided participants with opportunities to express opinions and share experiences in discussions centred on e-literacy theory and practice. The topics that emerged from discussions about technology in the B.Ed. programmes focused on teacher education and course content.

Similar to findings from the online survey questionnaire, focus group participants offered mixed reviews of technology education at the target institution that ranged from negative to condemning. One group, however, provided some constructive criticism on how teacher candidates use what they learn about technology in their lessons. In this case, Group A was talking about how they learned about Bitstrips in a technology class and subsequently used the website and saw others using it on placements as well:

> The teacher candidates are definitely taking that knowledge gained from [the technology class] and [are] applying it in their placements. …if they're exposed to it here [at the target institution], they'll use it in the schools. But also, having what's in the schools reflected in what we're learning is important.

The insight offered by this participant highlights a causal relationship where exposure in education promotes the practical application of knowledge.

Shifting from the constructive to critical, this section presents participant input on learning about responsible use of technology in the B.Ed. programme. Group B said they learned "zero," adding that course instructors "would say, 'use [technology] responsibly,'" without providing instruction or context. Group B also noted, "If we did touch on [responsible use of technology], it was probably for like fifteen or twenty minutes." Additionally, Group B stated:

> I think it was more that [professors] just did it themselves and we kind of just witnessed that as they retrieved information for their own lessons. But they never actually said, 'this is what I did,' they just put together their lesson.

These experiences were similar to those encountered in Group A, who stated:

> I kinda want to say I didn't learn about it. Yeah, it's honest… but in terms of being responsible with [technology], I think the only thing that has really been touched on is plagiarism – and I don't know if that falls under this scope or not.

115

Understanding what plagiarism is and how to prevent it is definitely an important factor of critical literacy, so it does represent at least something. But the common threads across both focus group discussions was (a) the recognition that responsible ICT use is not just important for all individuals, but for educators as well, and (b) there is a general lack of instruction on responsible ICT use across the different courses in the B.Ed. programmes, and especially within the instructional technology courses.

When responsible use was encountered by the participants, it was a brief excursion that engaged only superficial parts of the 5WH (who, what, where, when, why, and how) approach to critical inquiry. In the examples provided above, participants haphazardly witnessed professors using ICTs, but did not have the opportunity to witness *what* responsible practices professors used, nor did they have opportunities to delve deeper into the critical questions of *why*, *when*, and *how* that comprise responsible ICT use. As Group B discussed this reality, the consensus was reached insofar as, "Yeah, *why* is definitely lacking." Group A echoed similar sentiment when discussing the Bitstrips website (examined above) and responsible use: "we didn't get the *why*, we figured out the *how*." These comments from participants identify a deeply ingrained problem within the target institution, where technology is approached as an enigmatic tool, and is seemingly emphasized to satisfy syllabi and curricular requirements.

4.2.3 Technology in Practicum Placements

The theme of technology in the practicum placements that participants were required to complete provided them with opportunities to express opinions and share experiences in discussions centred on e-literacy theory and practice. The topics that emerged from discussions on technology in practicum placements focused on programming and lessons, personal devices in schools, and technology in full day kindergarten (FDK).

Programming and lessons.

In terms of programming and lessons, participants observed and participated in a range of technological contexts during their placements. Group B described the need for technology in the classroom to reflect the expectations that students will encounter in the real world:

> It is important, though, to prepare, because later in life they are going to be using all of these technologies. They are going to be allowed to use them whenever they want, so it's kind of like: they're going to use it anyways, so you might as well as have it in classrooms to kinda show them how to use it properly, …so they know how to use it safely and effectively.

Group B also described how technology fit into the schedule of a school they did a placement in:

> At my school this year, they had like a "technology block." But the only time I saw it, they used the SMART Board and [the teacher] more just used it for fun at the end of the day as something to do to wind down – they were just playing games….[The technology block] was a once-a-week thing, … in their five-day schedule.

Group B described a similar situation where Grade 4 students had a block programmed into their schedule called "50 free," which means

> every second week… [students] get fifty free minutes at the end of the day where they get to bring in their own device and/or games or whatever and just do their own thing for fifty free minutes…. ["50 free"] needs to be used the right way because I see how it's very distracting, how the kids will have [a device] sitting on their desk the whole day waiting and waiting and waiting 'til the end of the day to use it. And, you know, they'll touch it and want to use it, but then they're not allowed until the end of the day. So, it's a good and bad thing because I also see them using it for other things,

like sharing it with their friends, like teaching their friends something they didn't

know, or looking stuff up.

While using ICTs as a reward is not a bad idea, reserving them strictly for this purpose fails

to acknowledge and tap into the educational potential that ICTs offer as learning resources.

For example, Group B stated, "Right now, the class that I'm in, they use iPads probably once

a day for research and inquiry-based assignments. It's the most frequent [use of technology],

I think, that I've seen." Additionally, Group B noted that they saw ICTs being used on their

placements for multidisciplinary and cross-curricular purposes. In particular, IXL was used

for math, language arts, and drama assignments, and Khan Academy for math and history.

Personal devices in schools.

Personal devices in schools is another area where participants encountered a range of

experiences. Group B's discussion raised the question of who is in charge of implementing

policy for bring your own device (BYOD) in schools. Group B stated that the principal of

each school determines this policy. Group B also noted how students in one school "were

more than welcome to bring in their devices from home – as long as their parents were alright

with it – and then there were also additional devices provided for those who didn't have that

same capability." One particular benefit of BYOD policy is in the heightened ability to bridge

school work and homework: "I know at the school that I was at last, one of the grades… was

using Khan Academy for math, so that [teachers] could monitor [student] homework, because

everyone is registered in the teacher's class" (Group B).

Full day kindergarten.

In recent years, the Ontario has placed a renewed emphasis on full day kindergarten

(FDK) and early childhood education (ECE). Participants from both focus groups had

experienced placements in these settings and spoke about the ICTs they used and observed.

Group B noted the presence of iPads in an FDK classroom:

they have an iPad station where they'll take turns. I've also seen that with… a regular

computer, too. They only had four iPads, so with the younger kids, it was all about

taking turns and timing it. So, I mean, it adds more work for the teacher to make sure

that everyone's getting a turn and it's fair, but the kids really enjoyed it.

Group A, stated that sometimes there was technology and sometimes there wasn't any present

in FDK classes. Group A added that during a second placement, one FDK class "started their

day at the SMART Board together," noting how daily exposure to ICTs can be an effective

tool for developing routines and introducing responsible use practices to young learners.

4.2.4 Successes, Challenges, and Possibilities

The theme of successes, challenges, and possibilities provided participants with an

opportunity to express opinions and experiences in discussions centred on e-literacy theory

and practice. Topics that emerged from the discussions included successes in modelling and

using ICTs in the classroom, the challenges encountered within Bachelor of Education

(B.Ed.) programmes, and the potential for improvement.

Successes.

On using ICTs to model expectations, Group B recalled how they used a SMART

Board to display images to "show [students] ways they can do [the assignment]" and to

cross-reference things that were brought up through student-led inquiry. Group B also said,

"having that technology in the classroom is a useful resource because it's not just the one

artifact that you're trying to model, [because] you can access everything through an online

connection." Group A described how they used ICTs for a research project where students

could select from a range of programs and/or applications to produce a final product. This

research project provided students with the opportunities for differentiated expression

throughout the entire process (Group A). The opportunity for differentiated expression also

allows students to identify their strengths and cultivate a range of skills.

Challenges.

Participants from both focus group discussions appeared to be unanimous in their feelings of inadequate instruction within the Bachelor of Education (B.Ed.) programmes. In response to a question on teaching students about responsible ICT use, Group A replied:

> On a scale from 1 to 10, I would say I'm probably between a five and a seven, which might leave us at a six. I feel like I'm proficient in some things and can speak to some things through my experiences, but I haven't had the vast array of experiences that might be useful for a teacher…. And it's difficult to protect yourself and be responsible with what you're doing when you don't actually know what you're doing to begin with.

Group B responded, "There's no magic document or book to say 'this is how you teach [responsible use]'…. It's really whatever you know and how you can illustrate and portray that to the students." In essence, these participants are getting a good start by bringing their own knowledge and experience of responsible use to the classroom, but it is important to note that the challenge identified here is the lack of instruction and guidance that they are receiving through their purported 21st century teacher education training.

When the participants were asked if they had any concerns about teaching responsible ICT use to students, two additional topics emerged. Group B admitted they were concerned that "the students know more than the teacher." This may be a fair assessment of the current reality and can only be applied in a case-by-case manner, but it does identify the challenge that many teachers are currently in the midst of catching up to students in terms of ICT knowledge and practice. For any other subject in education, this reality would be inexcusable, yet the status quo remains: society is content with the fact that teacher candidates – at least the teacher candidate participants from this target institution – are generally ill-equipped to deal with preparing students for a future where the responsible use of ICTs is an important

life skill.

On bring your own device (BYOD) policies in schools, Group B described the confusing situations that result when policies differ from school to school:

I find it very intimidating, I'll go on my placement to some schools and they won't allow it. And then I'll go on placement to another school and they're like, "yeah, bring in your iPad… you can have your phone out, use this, use that." …[I]t depends on the principal. The school I'm at right now, the teachers always have their phones out, whether they're using them for classwork or not. And I've seen other schools where my first day of placement the teacher has been like, "you can't have your phone out." So because there's no set in stone rule… I feel like it makes our job harder, because we want to be able to use these [ICTs], but then we're not sure.

Here, the overt challenge faced by participants is the nature of BYOD policies differing from school to school. However, the deeper implicit problem is that without board-wide or provincial BYOD policies, students are potentially receiving vastly different technological experiences from school to school, resulting in unequal and inequitable ICT education.

Possibilities.

When asked about what they would like to see improved in the Bachelor of Education (B.Ed.) programmes, participants offered some insight on where they see potential. Group B wanted an improved instructional technology course: "I would like to use technology and software to portray ideas and illustrate concepts to students. I feel like we are not exposed to that at all." Group B added, "Even just like a handbook of technical supports. Or things we could use, you know, in the handbook or something that [professors] give us – if they can't address it with the class." These suggestions made by the participants offer an insider's perspective of the gaps that currently plague the curriculum at the target institution. The irony here is that there is no method for teacher candidates to provide this feedback directly to the

121

institution, resulting in a situation where teacher education is said to be learner-centred and geared for the 21ˢᵗ century, but the quantitative and qualitative evidence gathered in this research point to a different reality.

Overall, participant responses from both the online survey questionnaires and the focus group discussions have expressed resentment and frustration with the course instructor and the course curriculum. I feel it is necessary to acknowledge that while these are the subjective opinions of the participants, the overall consensus among the respondents and the point to the need for ongoing mandatory professional development opportunities for course instructors (ISTE, 2014b, 2014d; Pungente et al., 2005) so that they can properly instruct teacher candidates about the responsible use of ICTs. Ultimately, the instructional technology courses need to be updated to reflect the challenges that teachers face in 21ˢᵗ century classrooms with regard to using ICTs responsibly. Three major areas require attention in order to accomplish this potential for improvement: The instructional technology curricula require thorough revision and redesign; instructors from any/all courses that require ICTs need to be helped to develop a level of e-literacy proficiency commensurate with the demands of their assignments to instruct and guide teacher candidates on responsible ICT use; and the measure of technological proficiency on the practicum assessment, as well as the associates' role in assessing proficiency, must become more explicit and relevant so that teacher candidates have clear expectations.

CHAPTER 5

DISCUSSION

...new figures show that, by the end of 2014, there will be almost 3 billion Internet users, two-thirds of them coming from the developing world, and that the number of mobile-broadband subscriptions will reach 2.3 billion globally. Fifty-five percent of these subscriptions are expected to be in the developing world. Behind these numbers are real human stories. The stories of people whose lives have improved thanks to ICTs....By measuring the information society, we can track progress, or identify gaps, towards achieving socio-economic development for all.

–Brahima Sanou (ITU, 2014, p. 1)

The ubiquity of information and communication technologies (ICTs) in Canadian society can be seen, felt, and heard in all areas of public and private life. ICTs and Internet connections are increasingly used at home, in the workplace, and in schools, and this rapid and extensive proliferation has fundamentally changed life in 21st century Canada. It has also signalled a shift towards a knowledge-based economy (Aucoin, 2011; P21, 2009; Poole, 2009), where ICT knowledge, skills, and abilities are increasingly in demand for both work and leisure. Statistics Canada (2010) has identified an overall increase of individuals of all ages using the Internet at least one time a day at home, from 63.7% in 2005 to 75.1 % in 2009. When examining ICT-literacy rates and abilities and their implications for understanding digital divides along the digital spectrum (Haythornthwaite & Andrews, 2011), relying only on statistical measurements "provide[s] an insufficient view of this issue" (ETS, 2002, p. 6). Hence the need for a mixed-methods approach to inquiry that leverages valid and reliable data collection in order to understand the current successes, challenges, and possibilities entwined with improving responsible use of ICTs in education.

Confronted with unprecedented access to information through ICTs and Internet

connections, combined with Ontario's current transformation into a knowledge-based economy, "having a computer is not enough – increased exposure to technology does not automatically lead to increased ability to use it" (ETS, 2005, p.1). Additionally, "A measure of success today is how well one can evaluate, manage and communicate all forms of information within a technological environment" (ETS, 2005, p. 1). Thus, I have presented the theory of e-literacy as an evolution and an extension of responsible use knowledge and practices that exist in analogue and physical environments to be applied to digital and virtual contexts in K-12 education, because "the notion of a literate populace must be expanded to include the technology-based skills and abilities that will enable citizens to function in an increasingly technological world" (ETS, 2002, p. 1).

The research questions that guided this thesis were designed with these factors in mind. The literature review addressed the first research question (What are the international trends and benchmarks of e-literacy in education and how do Ontario's K-12 curricula incorporate these benchmarks into 21st century revisions?) to identify and contrast important elements of responsible ICT use. Literature was drawn from a range of international sources to develop the concept of e-literacy as the responsible use of ICTs. These international documents were then compared to a selection of Ontario's K-12 curricula to identify gaps and areas of improvement in policy and pedagogy related to e-literacy. Research questions two (What can the lived experiences of teacher candidates reveal about the target institution's theoretical and practical requirements of e-literacy for in-class and practicum assessment?) and three (How can the lived experiences of teacher candidates, with respect to e-literacy theory and practice, contribute to the development of teacher education programmes in the 21st century?) focus on a cross-section of teacher candidate participant perspectives from a teacher education institution in Ontario. These questions required ethical and rigorous methods of data collection and analysis to provide valid and reliable results. Since

pedagogical effectiveness is partially determined by the quality of our teachers, it is necessary to examine the reality of 21st century teacher education in Ontario. By triangulating data from the literature review and the findings, I have come to the understanding that not only does Ontario's K-12 curricula fail to address the responsible use of ICTs adequately and professionally, but participants also feel that the target teacher education institution neglects teacher candidate needs in preparing them for the challenges of 21st century classrooms with respect to e-literacy. In order to make sure Ontario K-12 curricula competes with international benchmarks of e-literacy (responsible ICT use), a three-pronged approach to improving curricular policy, teacher andragogy, and classroom pedagogy is required to ensure educational relevancy in the 21st century. The study written by Pungente et al. (2005) identifies nine crucial factors that support "successful media education" (p. 157). The first three factors call for (1) a "grassroots movement" where "teachers need to take the initiative…"; (2) support from "educational authorities" who can mandate, establish, and ensure guidelines, resources, and curricula; and (3) "[f]aculties of education" to employ "staff capable of training future teachers…" (p. 157). Through an in-depth look at the lived experiences of teacher candidates from the target institution, my work in this thesis aims to promote strategies that improve andragogical theories and practices in teacher education in order to have positive influences on pedagogy in 21st century K-12 classrooms.

In my opinion, ICT use should not be included in K-12 curricula without being attached to theory and practices of responsible use. If and when responsible use is called for in curricular documents, its domains and practices must be defined and codified. Otherwise, we cannot expect teacher education institutions to prepare teacher candidates for things that are not included in the curricula; and we cannot expect teachers to educate students without proper training. Even in curricula revised as recently as 2015, such as *Health and Physical Education, Grades 1-8* (Ontario, 2015a), Grades 9 to 12 (Ontario, 2015b), and *Canadian and*

World Studies (Ontario, 2015c), it is obvious that Ontario's approach to responsible use is not competing with the international benchmarks delineated in the literature review. The importance of codifying responsible use theory and practices into a curriculum is to guide teachers as they prepare students for the challenges of a technologically demanding era.

I sense there is a current imbalance between the proliferation of ICTs and the proliferation of knowledge and practices of responsible ICT use. The reason I call for e-literacy to be codified is because of the interdependent relationships between three areas of education in Ontario: Curricular policy developed at the provincial (or state, or prefectural, or national) level, andragogy in teacher education aimed at cultivating effective teachers who represent the next generation(s) of educators, and pedagogical practices that these teachers learn and implement as front-line educators in K-12 classrooms.

As Ontario's teacher education institutions prepare teacher candidates for a career in education according to provincial curricular documents, teacher candidates who go on to teach in K-12 schools will, in theory, apply the pedagogical principles and practices they were exposed to during their training. Furthermore, if classroom pedagogy is predicated on curricular policy, and curricular policy affects teacher andragogy, then it follows that teacher education institutions are both influenced by and exert influence on what happens in K-12 classrooms. Consider this: if society is increasingly integrating ICTs into all facets of public and private life, and if international benchmarks are calling for the responsible use of ICTs in education, the onus of preparing students for life in society falls upon teachers in K-12 schools. The connection between andragogy and pedagogy manifests as teacher candidates receive instruction on 21st century pedagogies from an accredited institute and then apply them in K-12 classrooms. However, if that accredited institution fails to equip future teachers with relevant pedagogical approaches, such as e-literacy, we cannot expect them to implement said untaught approaches to students. This cycle represents the current state of

education in Ontario regarding e-literacy and the responsible use of ICTs.

This thesis was directed at examining teacher candidate experiences of teacher education to better understand the interactions between curricular policy, andragogy in teacher education, and pedagogy in K-12 classrooms. The teacher candidate participants were important to the central theme of 21st century education because demographic data from online survey questionnaire shows that the majority of participants are relatively young, aged 20-29 (Table 1), meaning they grew up during the recent proliferation of ICTs, and they use ICTs both for school and outside of school more than three times a day (Tables 2c and 2e, respectively). Their first hand experiences as digital age students and teachers lend a unique perspective as they represent a particular cross-section of the teacher population who will be responsible for the development and implementation of 21st century curricula, including the responsible use of ICTs. Teacher candidates represent the new blood that is being infused into Ontario's K-12 education system, and if these new teachers are not equipped with e-literacy theory, then how can students across Ontario be equally and equitably exposed to knowledge and practice on the responsible use of ICTs?

In short, the trident approach to e-literacy reform in Ontario is to affect curricular policy at the governmental level, to affect andragogical practices at the teacher education level, and to affect pedagogy in the classroom. Examining the experiences of teacher candidates in this study allowed me to better understand where and how education reform can address 21st century issues via teacher education. Through the trident approach, I've come to realize that if only one area is addressed, such as in the grassroots movements studied by Beggs (2012), overall reform is impossible. If two areas are addressed, but one is lacking or ignored, reform is hamstringed. The trident approach shows true reform can happen only when all three areas are addressed so that they can influence and reinforce each other, and all three areas must be updated if Ontario's students are to become truly literate and contributing

members of an information society and economy.

The following sections in this chapter summarize the major findings in answering the research questions, discuss the limitations of my study, and provide recommendations for future research.

5.1 Research Questions and Review of the Major Findings

Sections 5.1.1 – 5.1.3 will answer the following research questions that guided this research by addressing e-literacy in Ontario's education through the trident approach.

1. What are the international trends and benchmarks of e-literacy in education and how do Ontario's K-12 curricula incorporate these benchmarks into 21st century revisions?

2. What can the lived experiences of teacher candidates reveal about the target institution's theoretical and practical requirements of e-literacy for in-class and practicum assessment?

3. How can the lived experiences of teacher candidates, with respect to e-literacy theory and practice, contribute to the development of teacher education programmes in the 21st century?

5.1.1 International Benchmarks and Ontario's K-12 Curricula

To answer the first research question, I conducted a literature review to advance the disciplines of ICT education and literacy education by accumulating "past endeavours" and summarising "major issues" presented by scholars, professionals, organizations (Evans & Kowanko, 2000, p. 33). The literature review was aimed at understanding the elements that comprise responsible ICT use by examining the international benchmarks that have been established. These benchmarks were then compared to a selection of Ontario's K-12 curricular documents to determine *how* and *where* Ontario meets the need for responsible use in K-12 education.

Through the literature review of international benchmarks and curricular documents,

I recognized both positive and negative qualities in Ontario's current climate of 21st century e-literacy education. The good news is Ontario's K-12 curricula appear to embrace ICTs as multimodal educational learning resources. The bad news, however, is that these curricula acknowledge ICTs as important, but fail to follow through with tangible and relevant support for implementation and responsible use. Employers (Ontario, 2014, 2009a, 2009b) and higher education institutions who operate within knowledge economies and societies (Aucoin, 2011) expect K-12 schools to prepare students for the realities of ICT challenges in 21st century environments. The review of a selection of Ontario's K-12 curricula identified the presence of a section dedicated either to "The Role of Technology" (Ontario, 2006, 2007b, 2007c) or to "The Role of Information and Communications Technology" (Ontario, 2007a, 2008, 2009a, 2009b, 2010b, 2013a, 2013b, 2015a, 2015b, 2015c). The content of these sections, albeit limited, demonstrate that Ontario's policy makers are serious about integrating ICTs into education as early as kindergarten and across a wide range of subjects. This also indicates Ontario's acknowledgement of the importance of technological proficiency and points to its potential in cross-curricular, interdisciplinary, and differentiated applications. However, even though these curricula call for the responsible use of ICTs, they provide little to no explanation on exactly *what* responsible use is, *why* it is necessary, *when* and *where* to apply it, or *how* it can be accomplished efficiently and effectively.

5.1.2 e-Literacy Requirements in Teacher Education

To answer the second research question, the experiences and opinions of teacher candidate participants were collected through an online survey questionnaire (Appendix C) and through focus group discussions (Appendix D). These two data collection instruments yielded both quantitative and qualitative data, which were analyzed using a mixed-methods design to allow the strengths of each type of data to compliment and reinforce the other (Creswell, 2012). Before answering questions that included the term "e-literacy," participants

were required to read a brief section that defined e-literacy as the responsible use of ICTs. Participants were then asked to provide feedback about e-literacy instruction and assessment within their in-class learning and practicum placements. Participant feedback for in-class learning focused on the topics of course content and course instruction, while the topic of assessment emerged from the theme of technology on practicum placements.

For the in-class learning portion of their teacher education, the general consensus provided by participants on their instructional technology courses at the target institution represented an overall negative experience. Participant 4a-1 wrote, "The actual technology course taken was essentially a section of students presenting the resources that they have come across and have used [o]n placement or found." Participant 4a-5 stated, "This course didn't provide much information on anything, but definitely not on e-literacy practice. I'm more interested in learning about how to implement technology and e-literacy into the classroom not about what a particular software can do." Participant 3h-5 wrote, "I think that we need to have an effective 'technology' course where we learn what are the best methods of ICT[s]. The professor should be providing us [with] the tools for us to be successful in the classroom."

Feedback from teacher candidate participants reflected similar negative sentiment toward the method of instruction within the technology course. Participant 4a-2 acknowledged that some instruction on e-literacy was provided, "however, the course was taught by students throughout the year so we taught ourselves and shared websites and resources we found with each other. There was not too much information shared from the professor." Participant 4a-4 noted,

> There was no instruction. The professor never taught, but instead had all the students present. The feedback from the professor offered no insight into the technology but instead commented on our presentation abilities. Many students were unfamiliar with

the technology they were presenting on and the professor offered no clarification on

how to use it, or if it was being implemented to it's [*sic*] full potential.

Participant 3i-7 offered a constructive piece of criticism, "I think we need to be educated on

what is out there to use, but also how to use it efficiently." This comment is of particular

importance, because as focus Group A discussed,

The teacher candidates are definitely taking that knowledge gained from [the

technology class] and [are] applying it in their placements. …if they're exposed to it

here [at the target institution], they'll use it in schools. But also having what's in the

schools reflected in what we're learning is important.

It is unclear whether Group A meant that teacher education needs to reflect the

contexts of the school in terms of equipping teacher candidates with ICT proficiency or for

ICT responsibility. Yet, these two areas are not mutually exclusive, and thus should be

addressed together. From my own experience taking an instructional technology course from

this same institution (2012-2013) and through the data provided by teacher candidate

participants I have collected, analyzed, and presented, it is undeniable that the form, content,

and andragogical approaches to ICT education at this institution are in need of reform,

revision, and relevance. I do want to make it clear, however, that I do not think the lack of

relevant course content or the instructional methods are the fault of the instructor. The real

problem at the centre of this issue is (a) the outdated instructional technology course curricula

and the corresponding syllabi, (b) the andragogical approaches applied by the target

institution in general and the course instructors in particular, and (c) the expectations for

assessing ICT proficiency and the methods for measuring it, including the role of the

associates. Each of these areas require serious attention in order for the target institution to

rise to the challenges of 21st century education and achieve its potential as a leading teacher

education institution.

The importance of equipping teachers with relevant knowledge and skills of e-literacy is reflected in the "ISTE Standards: Teachers" (ISTE, 2014d) document. Teachers in the 21st century classroom are expected not just to know how to use ICTs, they are expected to "demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations," and to "[p]romote and model digital citizenship and responsibility" (pp. 1-2). If teacher candidates are not receiving adequate education on responsible ICT use in their teacher education, it cannot be reasonably expected that these teachers will expose theory and practices of e-literacy to students. Similarly, if course instructors do not "promote and model" responsible practices, teacher candidates cannot develop the knowledge and practice of e-literacy, nor can they be authentically assessed on it.

The feedback offered by teacher candidate participants for the practicum placements focused on assessment. Results from Table 4d show that 72.62% of participants believed that e-literacy should be included in practicum assessment requirements. Participant 4d-5 offered additional insight:

> proficiency should not be assessed if the [target institution] does not have professors that are going to instruct adequately. It's unfair to students who are not familiar with the technologies to be assessed if they were not taught how to use the technology in their program.

Concerning relevancy of the assessment used to identify teacher candidate technological ability during practicum placements, results from Table 4b identify how 73.81% of participants believed that the measure of "Use technology effectively" fails to reflect their e-literacy needs. Participant 4b-8 noted, "Simply because teacher candidates need to show that they can use technology effectively, does not mean that they are required to show how they can teach students e-literacy." Referring to the individuals responsible for practicum placement assessment, Participant 4b-4 wrote, "Associates interpret this as

whether or not you can use a computer effectively," which hardly scratches the surface of the capability domain. Participant 4b-2 described a situation they experienced with assessment:

> I was told to use technology to get a 'check' on this part of the assessment. It was hypocritical of some associates who told me in my reports that I was to use more technology in the classroom, when the most technological thing they use is [*sic*] transparencies.

Additionally, Participant 4b-1 recognized that the assessment was inadequate by stating, "What was not taken into [account] is the variety of technology or lack of technology."

Ontario's (2010a) approach to assessment is one that cultivates students through "assessment *for* learning" and "assessment *as* learning" (p. 28). In assessment *for* learning, "teachers provide students with descriptive feedback and coaching for improvement," while assessment *as* learning occurs through teachers who engage students to "develop their capacity to be independent, autonomous learners who are able to set individual goals, monitor their own progress, determine next steps, and reflect on their thinking and learning" (Ontario, 2010a, p. 28). Yet, participant feedback indicates that the required technology course simply exposed participants to ICT use, as opposed to responsible use, through a curriculum that overemphasized capability, focused heavily on student presentations, and contained dated andragogical approaches.

Thus, to answer the second research question, the lived experiences of teacher candidate participants aid in identifying the challenges within the instructional technology course and in practicum placement assessment. These challenges result from the inadequacy of course content and course instruction, and the lack of practicum assessment *for* and *as* learning. One possible solution was identified during a focus group discussion, wherein Group B hoped that the target institution could provide "a handbook of technical supports," highlighting the absence of curricular materials even at the teacher education level. It is,

however, understandable that the teacher education institution does not have curricular

documents on responsible ICT use when Ontario's K-12 curricula neglect to address this

issue adequately. Without policy directives from Ontario that are overtly aimed at responsible

ICT use in K-12, teacher education institutions have no reason or motivation to address this

issue. Hence, the trident approach recognizes that the interdependent relationship between

curricular policy and teacher education directly affects the quality of teachers entering the K-

12 education system in Ontario.

5.1.3 Improving 21st Century Teaching Education

To answer the third research question, data analyzed from teacher candidate

participant experiences were triangulated with findings from the literature review to suggest

ways of improving 21st century teacher education in Ontario. The data analysis used a mixed-

methods design (Creswell, 2012) and the additional layer of analysis drawn from the

literature review enables reliable and valid results to be derived from the research question.

The combination of participant lived experiences and literature review has allowed me to

identify gaps in the content, instruction methods, and assessment related to e-literacy in

teacher education at the target institution. These gaps are organized and examined according

to the four domains of e-literacy in the following sections: capability, critical literacy,

citizenry, and safety.

Capability.

The demographic results derived from the online survey questionnaire describe the

sample population of teacher candidates [n = 84] as individuals who use ICTs regularly. On

using ICTs to access content on the Internet, results from Table 2a show that all of the

participants rated themselves as either able to use technology "without assistance" (80.95%),

or "with minimal assistance" (19.05%). Table 2c indicates that the majority of participants

use ICTs and the Internet for school-related purposes more than three times a day (71.43%).

Outside of school-related purposes, Table 2e reveals that the majority of participants use ICTs and the Internet more than three times a day (76.19%). In terms of participant use of ICT devices to access the Internet (Table 2g), the top three responses were computer/laptop (97.62%), Smart phone (92.86%), and tablet (including e-readers) (38.10%). Participant use of the Internet (Table 2h) reveals high rates among several categories, including retrieving (100.00%) and disseminating (54.76%) information, sending/receiving email (98.81%), accessing social networking sites (90.48%), text chat (80.95%), browsing/purchasing merchandise (79.76%), audio/video chat (46.43%), and playing games (38.10%).

These statistics show that teacher candidate participants are well-acquainted with ICTs and use them for a wide-range of purposes on a regular basis. The domain of capability, however, is concerned with three facets of ICT use: (a) access to technology, (b) knowledge of technology, and (c) practical application of knowledge. Even though the statistics above indicate high levels of self-efficacy and use across a wide range of devices and for a variety of purposes, all three facets of capability are not necessarily present. The role of a teacher education institution is to prepare teacher candidates for the reality of 21st century classrooms, so that teachers can prepare students for the realities of life in society. The following sections draw from participant input and relevant literature to discuss the state of capability access, knowledge, and practice in teacher education at the target institution.

Access to technology is the first area where individuals and populations can encounter digital divides within the digital spectrum (Haythornthwaite & Andrews, 2011). Simply not having access to ICTs, infrastructure, and/or resources can result in being on the wrong side of the digital divide – in other words, the have-nots. When participants were presented with the statement: *If schools do not have access to a wide range of ICTs, they should not have to teach about e-literacy* (Table 3e), 50.00% disagreed and 34.52% strongly disagreed. Participant 3e-6 wrote, "Just because schools don't have [ICTs], it doesn't mean

students don't or that students won't have access to them in the future." Participant 3e-3 stated, "Even with minimal access, students should still learn about e-literacy because they will encounter [technology] throughout their lives." Participant 3e-4 believed, "Almost everyone has access to [the] internet these days, so teachers should cover topics like internet safety, and how to analyze information on the web."

These comments reflect the need for schools and teachers to provide students with access to technology (ISTE, 2014a). By extension, teacher education institutions must provide teacher candidates with access to ICT devices and infrastructure so that they are familiar with the learning resources found in most 21st century classrooms. Access to ICTs does not appear to be a concern for the participants, since throughout all of my findings, there was no indication that the target institution lacked the necessary ICT devices or infrastructure for teacher candidates.

The second facet of capability is knowledge of technology. While knowledge of technology can be developed in the absence of access, it cannot be applied without the presence of ICTs and infrastructure. Digital divides can also occur within knowledge of technology, particularly between those who have experienced theoretical instruction and those who have not. I believe that the first area of concern for teacher education at the target institution is on knowledge of technology. Participant 3a-19 wrote, "Most primary students are introduced to devices that can bring them to the internet, so students should have a background that not only teaches them how to access the internet, but also how to use it appropriately." Participant 3i-3 noted, "During our time [at the target institution] is the prime time to learn about e-literacy and our professors do not do the proper job. They lack effort and proper teaching methods for [e-literacy pedagogy and practices]… even our technology professor." Participant 4a-5 "[The technology] course didn't provide much information on anything, but definitely not on e-literacy practice. I'm more interested in learning about how

to implement technology and e-literacy into the classroom not learning about what a particular software can do."

Similar comments appeared in the focus group discussions, wherein consensus was reached that the technology courses were successful in exploring *what* ICTs could be useful for in the classroom, but neglected *why*, *when*, and *how* these ICTs can be used responsibly (Group A; Group B). Participant input gleaned from both data collection instruments indicates that the target institution succeeded at introducing teacher candidates to useful ICTs, but neglected the deeper theoretical knowledge that promotes efficient, effective, and responsible ICT use.

The third facet of capability is the practical application of knowledge or praxis. This facet relies on both access to and knowledge of technology in order for true technological proficiency to be developed. Many participants indicated that the ways they were expected to demonstrate ICT proficiency missed the mark of responsible use. Participant 3k-3 wrote, "We taught ourselves by researching an area and then presenting the material to our classmates." Participant 4a-1 responded:

> The actual technology course taken was essentially a section of students presenting the resources that they have come across and have used in placement or found. [There] was no instruction, just group presentation. So how is a student who is new into the field suppose[d] to teach other students about a topic that they have not been informed on? The irony of an education course instilling poor teaching practices was ridiculous.

Similarly, Participant 3a-12 remarked,

> Children are accessing the Internet and a wide variety of forms of communication at an increasingly younger age. I feel that it would be appropriate to begin e-Literacy training alongside of computer use. When the Ministry of Education or school-board

feels that it is appropriate to have students using computers and other forms of technology, it is then when e-Literacy should be required as well.

In recognizing gaps in their own educational experiences at the target institution, these participants also identified the connection between the need for e-literacy to be leveraged at the use of technology for all ages, including teacher candidates.

Part of the issue at the heart of the capability domain is the lack of policy that guides instruction. The trident approach recognizes that without overarching policy, especially in K-12 curricula, teachers may not receive the skills and knowledge of technology, nor the opportunities to apply this knowledge in their training. Participant 3c-7 presented this idea succinctly,

As teachers, we need to continue to grow, and one way in which we especially need to grow is in that of technology use within the classroom. We are the best people in the world to role-model and teach the use of technology. However, in order to do so, we need to get over our fears of ineptitude and take on the responsibility of ICTs for our students.

I agree with this statement for two reasons. First, we cannot expect parents, who may not have the skills and training to teach responsible ICT use, to teach children about e-literacy. Second, teachers are indeed in an excellent position to model responsible use knowledge and practices to children. However, how can teachers accomplish this difficult task if they receive little to no exposure to principles contained in the domain of capability?

Critical literacy.

I believe that the ubiquity of ICTs in 21st century society calls for the ubiquity of critical ability. It took centuries for traditional literacy rates to catch up to the proliferation of mass-printed materials. Decades after Freire's (2005) work on critical literacy, I still see and hear daily cases where friends, family, and strangers receive and transmit information without

critically analyzing it. I realize that critical literacy is a constant effort; however, my point is that if it takes too many decades for education to address the critical literacy domain in curricula, I will have to write another thesis on the challenges of education in 22nd century Ontario (provided, I make it that far…). Simply put, the critical literacy part of e-literacy focuses on the responsible consumption and production of content through ICTs. Critical literacy should not be relegated strictly to Language Arts or English curricula, because it has cross-curricular and interdisciplinary applications. As Participant 3a-20 put it, "With the technological advances in society, it is necessary to include e-Literacy in the K-12 education as children will be surrounded by [ICTs] their entire lives."

Critical literacy skills serve as inquiry tools, are used to determine the bias, veracity, and reliability of information (Luke, 2012; Freire, 2005), and are employed for the purpose of responsible consumption and production of media. Concerning the responsible use of ICTs in teacher education, however, focus Group B discussed the problem wherein course instructors "would say, 'use [technology] responsibly,'" but then not provide any instruction or context for it. Participant 4a-21 stated, "I think that students should be taught how to properly navigate technology. Students should be taught how to research information effectively and how to share information safely." This particular statement applies to both contexts of K-12 education where teachers should use appropriate pedagogies to model and demonstrate (ISTE, 2014d) critical skills of responsible use, and in teacher education where course instructors should use appropriate andragogies to prepare teacher candidates for their careers in education. Participant 3c-2 insightfully put, "Students learn through a modelling method, which is important for students to see that even teachers practice what they teach."

e-Literacy represents the responsible use of ICTs and the domain of critical literacy represents the skills necessary for critical inquiry across all subjects and disciplines. Thus, critical literacy, and by extension e-literacy, must be addressed through cross-curricular and

interdisciplinary applications. In the online survey questionnaire, teacher candidate participants were presented with the statement: *e-Literacy curriculum is best integrated through cross-curricular and interdisciplinary methods, instead of as its own subject*. The majority of participants were in favour, with 44.05% agreeing and 44.05% strongly agreeing with the statement.

Some participants provided additional comments. Participant 3d-10 wrote, "There is already so much teachers are responsible for from the curriculum, they don't need a whole new subject to teach when it can just as easily be integrated and therefore more authentically taught." Participant 4a-6 responded,

> critical literacy should go beyond arts and language arts curricula. It's especially important in science (for example, understanding bias in a news report about a scientific study; or asking critical questions about a science's reliability and validity based on what has been read).

Participant 3d-1 recognized that "students will be using e-literacy to research a variety of subjects. Incorporating it off the hop allows for them to get the correct perspective of how it can be used." Participant 3d-7 commented,

> Considering the lack of time for the school subjects already within the curricula, such as Health and Physical Education and the Arts, I feel that e-Literacy should be integrated through cross-curricular methods. This would allow students to experience e-Literacy through continuous and practical application instead of theory, which would create a better understanding.

Critical literacy skills represent the tools that enable ICT users to be responsible producers and consumers of information. Connecting the three facets of capability to critical literacy means that students need access to technology, knowledge of critical literacy skills, and opportunities to apply that knowledge through practice. Critical literacy also should be

present in cross-curricular and interdisciplinary contexts. However, in order for teachers to be able to equip students with critical literacy skills, they must first have the knowledge and ability for themselves. The best place to achieve this is in teacher education institutions.

Citizenry.

The purpose of schools is to prepare students for life in society (Noddings, 2005, 2007). Ontario is currently transitioning to a knowledge economy and a knowledge society. Thus, education must prepare students for the challenges they will encounter in the future. If education institutions fail to do this, schools will be contributing to, as opposed to thwarting, digital divides. Schools have the greatest potential to influence Ontario's young minds, or as Participant 3b-21 put it, "If taught in school, all children have equal opportunities to learn." However, it is important that an emphasis on anti-racism and equity prevents marginalized students from falling through the proverbial cracks. Additionally, education is society's best opportunity to equip students with their own agency through digital empowerment (Mäkinen, 2006). In this context, agency is developed through critical literacy as well as communication (P21, 2009) and collaboration (ISTE 2014a, 2014b, 2014d) skills that enable individuals to engage and participate in communities and societies. Agency is also necessary for individuals to carry out their civic duties (P21, 2009) as responsible citizens.

Communication and collaboration between the home and school is necessary for students to become engaged citizens and e-citizens. When teacher candidates were provided with the statement *Parents should have the primary responsibility of teaching e-literacy skills to children* (Table 3b), the responses were mixed: 44.05% disagreed, 27.38% agreed, and 25.00% were unsure. The comments provided by participants help shed light on this division of opinions. Participant 3b-30 wrote, "I think it is important for both parents and teachers to teach e-literacy skills to children." Participant 3b-29 reasoned, "Although parents should place emphasis on e-Literacy within their child's home environment, I believe that in today's

society, the responsibility of teaching these skills should be shared between the child's parents and educators due to the recent technological advancements." Participant 3b-10 recognized,

> Parents play a role, but many are ill-equipped to truly teach their children about e-literacy, either because they don't know what it is, they do not use ICT[s] enough, they're uncomfortable teaching it, or because they wouldn't know how to approach and teach it.

These participants realize the importance of building collaborative communities of practice (Lave & Wenger, 1991) between homes and schools to promote and integrate the domains of e-literacy into children's lives.

Drawing from Beggs' (2012) study of K-12 schools in Ontario, concerns over the need for students to "learn how to make good personal choices in their use of technology – that becoming a 'critical consumer' on the internet highway was a huge shift in the teaching and learning environment that teachers and school boards now need to consider" (p. 148). Beggs (2012) also reveals a particularly interesting observation on digital citizenship from participants in the early elementary years, wherein they felt that "getting notions of digital citizenship in from the beginning of school life would alleviate many problems later as that knowledge would be taken for granted as children moved through the grades" (p. 149). This concept applies not only to citizenship, but to the domains of capability, critical literacy, and safety as well.

In order to start students from a young age, teachers need to be equipped with the proper knowledge, skills, and practices concerning e-literacy. When I asked focus group participants how prepared they felt on this issue, Group A replied,

> On a scale from 1 to 10, I would say I'm probably between a five and a seven, which might leave us at a six. I feel like I'm proficient in some things and can speak to some things through my experiences, but I haven't had the vast array of experiences that

might be useful for a teacher…. And it's difficult to protect yourself and be

responsible with what you're doing when you don't actually know what you're doing

to begin with.

This is yet another example of how the target institution is not providing teacher candidates

with training worthy of a 21st century learner-centred educational setting. The problem here is

cyclical in nature. First, society cannot expect all parents/guardians to teach all children about

citizenry, let alone e-literacy. This is partially because these parents did not grow up in a

system of education that prepared them for this challenge. Second, participants in this study

indicated that they do not feel equipped with the necessary theories and pedagogies to deal

with the particular issue of responsible ICT use on multiple fronts. Third, the teacher

education institution is failing to address this issue for *some* reason(s), which could be

attributed to either neglect, poor actualization of self-improvement strategies, or simply

because responsible use is not clearly defined in the Ontario's K-12 curricula.

I see three potential outcomes to this present situation: (1) nothing changes and

society will continue to struggle with reality of a range of populations with varying degrees

of e-illiteracy, (2) the Ontario curriculum will eventually adapt to the (not) new challenge of

preparing students to be responsible users of ICTs and e-citizens, or (3) teacher education

institutions will foresee this gap and address it on their own, thus spearheading innovation in

the field of teacher training. However, the revolution that truly brings Ontario's education

into the 21st century requires the trident approach of changing curricular policy to reform

teacher education so that teachers can bring relevant strategies to K-12 classrooms and

prepare students for future challenges.

Safety.

The domain of safety in e-literacy is to promote the well-being of ICT users and

protect them against the inherent dangers of ICTs and the Internet. Among these dangers are

cybercrime, online predators, and viruses (Poole & Sky-McIlvain, 2009), and these examples represent only some of the threats that may result in physical, emotional, intellectual, and financial harm to ICT users. Review of Ontario's curricular documents identified the highest concentration of material devoted to student ICT safety in the newly published *Health and Physical Education* curricula for *Grades 1-8* (Ontario, 2015a) and *Grades 9 to 12* (Ontario, 2015b). Even though these two documents focus primarily on physical environments, they are interspersed with topics related to "online gambling," "cyberstalking," "cyber-bullying," "sexting," and "excessive screen time" (Ontario, 2015a, 2015b). I believe this is a mediocre start to addressing ICT safety in Ontario's curricula; however, as discussed above, e-literacy in education needs to be found in cross-curricular and interdisciplinary applications.

Participant 4a-2 commented, "It is important to teach students how to become responsible e-literacy members, most importantly from the safety aspect." Safety and ICT use was also mentioned by focus Group B, who provided examples of social media, filesharing, and threats associated with "stranger danger." Unfortunately, the threats outlined in Ontario's curricular documents and by the participants are just the tip of the iceberg. More research needs to be conducted to fill the gaps within the domain of safety.

As Ontario's curricula are being updated, teacher education institutions also need to reflect this progress across a range of safety topics. Beggs (2012) reveals concern from her study's participants on "the safe and ethical use of technology," on "issues surrounding control of technology in school boards," and "whether the focus should be on infrastructure that restricts or controls student access or on providing an open environment and then focusing on educating students about safe use and establishing restrictions and controls for inappropriate use" (p. 148). In my own research, focus Group A and B both voiced concern over the range of "bring your own device" (BYOD) policies that exist from school to school. Group B also called for more technical safety measures to be integrated into teacher

education: "I think it would definitely be a good thing to know more about how computers work, and where viruses come from and how to deal with them once you do have them." There are also the legal and ethical issues of ICT use and safety (ISTE, 2014b, 2014c, 2014d; NCTE, 2013; P21, 2009), such as taking pictures or videos of young children. Group A discussed a situation where consideration of identity protection led to teachers taking pictures of students' hands doing work instead of another angle that would include their faces. Group A also presented a hypothetical situation that identifies a gap in the ICT instruction received from the target institution:

> If I'm making this video with my class about vegetables or something, maybe we decide to put that on YouTube so that they can show it to their friends and family. Where does being responsible and being protected come in to now, putting that into a public domain for other people to use?

Indeed, this is an important issue that should be addressed in a range of teacher education courses, along with the use of release forms that allow parents/guardians to opt-in and allow media of their children to be captured ("iKeepSafe," 2009).

The purpose of the domain of safety in e-literacy is to promote knowledge of safety and instill safe practices into teachers so that they can practice, teach, and model legal and ethical approaches to using ICTs. However, this study identifies that teacher education at the target institution fails to address ICT safety in depth and via cross-curricular and interdisciplinary applications. The trident approach recognizes that curricular policies should influence teacher education, so that teachers can influence students. As Ontario's curricula gradually address the issue of ICT safety, I hope that teacher education follows suit and adapts to provide teacher candidates with appropriate 21st century approaches to protect themselves and the students under their care.

5.2 Limitations of the Study

Honesty and accuracy in asking questions, recordkeeping, and the reporting of findings are required (Bouma et al., 2012, p. 21) to maintain valid, reliable, and honest results in answering the research questions. Throughout the course of writing this thesis, the research questions evolved so that I could better understand the relationship between international benchmarks and Ontario's curricula, and better examine teacher candidate participants' experiences. The research questions found in the appendices reflect an earlier but not altogether different version of their current form. Additionally, early in the formulation of e-literacy, the current four domains were conceptualized as the four "aspects." To better capture how capability, critical literacy, citizenry, and safety overlap and reinforce each other, the term "aspect" was replaced by "domain." The appendices reflect these early versions of the research questions and the components of e-literacy, but have limited impact on the data collection, analysis, and findings presented in this research.

Overall limitations to this study include the finite resources of time and money I had at my disposal. More time could have potentially had the impact of increased results through a longitudinal study conducted on two fronts: (a) the Concurrent programme students could have been studied throughout their five year programme, and (b) all teacher candidates could have been observed as they graduated and moved on to teaching in K-12 classrooms. Money also played a factor insofar as the data collection instruments, namely the online survey questionnaire and the focus group discussions, offered no incentives due to financial constraints. Incentives could have potentially increased participation rates.

Specific limitations are derived from the theory of e-literacy, the literature review, and the data collection instruments. The theory of e-literacy knowledge and practice is new and incomplete. I appropriated the term "e-literacy" to represent the responsible use of ICTs through the four domains of capability, critical literacy, citizenry, and safety. The domains of

e-literacy, however, may not be limited to only four.

The selected review of Ontario's curricular documents was intended to provide a survey of relevant curricular subjects and was not meant to be inclusive of or represent the entirety of Ontario's K-12 curricula. Additionally, Beggs (2012) states that some of the data collected in her case study were self-reported. The potential for bias in self-reported data lends to an additional limitation found in the literature review.

The specifics of limitations in the data collection instruments pertain to both the online survey questionnaire and the focus group discussions. First, the voluntary nature of the online survey questionnaire resulted in a response rate of 13.04%, which appears low, but it is important to note that lower than traditionally accepted response rates should be expected when employing online surveys (Kraut et al., 2004, p. 108). Similarly, the voluntary nature of the focus group discussions produced only eight participants. Obviously, more participants would have provided a greater range of perspectives and experiences on teacher education. Second, the self-reported nature of participant input may contribute to bias in the data stemming from inconsistencies between personal perspective and objective reality. This study does consider, however, that participant experiences represent unique and valid perspectives. Third, due to the small size of the sample population [n = 84], the findings of my research and the implications contained herein cannot be generalized or extended to include the entire teacher candidate population within the target institution, nor can the specifics of the target institution be extended to other teacher education institutions in Ontario. Fourth, if more resources of time and money were available, the study could have benefited through the participation of additional teacher candidates. The study could have also been improved through the inclusion of course instructors and faculty administrators, so that their perspectives and lived experiences could be incorporated into a better understanding of the successes, challenges, and possibilities of teacher training and preparation.

Five particular limitations are found within the online survey questionnaire. First, the demographic data is not meant to be used to correlate any combination of age, gender, programme, or ability for the purpose of identifying digital divides or patterns of teacher candidate enrolment at the target institution or otherwise. Second, the question asking participants to self-rate their ICT ability (Table 2a) contains the potential for bias and should be recognized as a possible limitation. Future studies on this topic should consider better phrasing or an altogether different method of assessing this variable. Third, the question asking participants about their use of the Internet (Table 2h) should have phrased the second category (Disseminate information) in a way that made it clear to participants that even posting or commenting (such as on social media fora or blogs) is included. Fourth, the statement asking participants to provide their input on how the target institution addressed their "e-literacy" needs (Table 3k) yielded qualitative responses where some participants noted that the term "e-literacy" was present/absent from their courses, while others wrote about the presence/absence of instruction on "the responsible use of technology." The term "e-literacy" was defined earlier in the survey questionnaire to mean "the responsible use of technology," but some participants might have misinterpreted the term as an already defined phrase in academia. Better phrasing of the question may have yielded data with more specificity. Fifth, participants were provided with the option of refusing to respond to questions/statements and this contributed to several gaps in certain areas of the collected data. Survey questionnaires that were submitted but were only partially complete were not included in the data analysis, whereas survey questionnaires that contained gaps where participants refused to answer certain questions were included and these questions can be identified within the tables included in Chapter 4.

The last limitation has to do with the trident approach. This three-pronged approach to education reform recognizes the interdependent connections between curricular policy at

the provincial level, andragogical practices in teacher education, and pedagogical practices in K-12 classrooms. I have made the claim that teacher education is programmed to reflect curricular policy and realities in K-12 classrooms. Therefore, I believe that changes in curricular policy will force teacher education institutions to adapt or to fall behind. If this assumption is incorrect, the data collected in the study is not invalidated, nor are the connections between the three prongs incorrect, it simply means that teacher education institutions devise their curricula from some other standard.

5.3 Suggestions for Future Research

This study was meant to accomplish two things: (1) develop and present a theory of e-literacy knowledge and practice devised from international trends and benchmarks of responsible ICT use, and (2) to examine the lived experiences of teacher candidates in the target institution to understand where successes, challenges, and possibilities exist regarding e-literacy and teacher education. Since e-literacy is a new theory, it remains incomplete and requires further research and exposition to fully encompass the breadth and depth of responsible ICT use. To continue the development of e-literacy theory, I have two specific areas in mind: application and domains. For application, this thesis was designed to explore and examine *what* e-literacy is, but did not delve into specifics on *how* it can be applied to andragogical and pedagogical contexts. In terms of the four domains, writing this thesis has caused me to believe that there is one additional domain that requires attention: "identity." I envision the domain of identity to critically engage (a) persona construction through handles, profiles, avatars, etc., (b) anonymity in online and offline environments, and (c) anti-racist education – not multiculturalism. It is important to distinguish between these terms in the last instance, because as Dei (2001) points out, anti-racism

> …challenges the celebration of culture without a serious attempt to deal with the
> unequal power relations that crosscut our societies. Anti-racism asks about the power

behind the construction, naming and celebration of difference. Anti-racism ruptures difference as a basis or justification for power and domination in society. (p. 150)

To construct a more comprehensive understanding of e-literacy in teacher training and K-12 education, the foundation built by this research also requires further study on the three areas represented in the trident approach. The first area requiring further research is on Ontario curricular documents as they are continually updated to reflect 21st century aims, goals, and objectives of education (Noddings, 2007). The second area that requires further study is teacher education, specifically the approaches to curricular (i.e. cross-curricular and interdisciplinary) design and andragogical practices, as well as into the lived experiences of teacher candidates, course instructors, and administrators who operate within these institutions. The third area requiring study is in K-12 education where teacher approaches to pedagogy and the learning environments of classrooms, schools, and communities need to be better understood. As the three areas of curricular policy, andragogy in teacher education, and pedagogy in K-12 education are interdependent, research into one or all of these areas offers potential benefits for the others.

Another direction that further research can take is in studying a different teacher education institution or a comparison between several institutions. This can be done within Ontario, in another province, or even another country. Part of the inspiration for this thesis came out of my experiences of teaching in Japan during the rapid proliferation of ICTs that accompanied the introduction of Smart phones. However, the theory of e-literacy as the responsible use of ICTs is not reserved for developed countries only. The ubiquity of ICTs and wireless infrastructure means that even developing nations and people in remote areas are increasingly incorporating technology into their lives and will require knowledge and practice of using these ICTs responsibly.

5.4 Conclusion

  The ultimate pursuit of e-literacy is to develop expertise through learning directed at "the explicit knowledge of a field, the practices of its community, and the interplay between the two" (Brown, 2000, p. 15). e-Literacy also seeks to develop critical and ethical citizens who practice proactive and preventative approaches to ICT safety. The four domains can be understood as cuts on the blade of a key that is e-literacy. This key represents the ability inherent in e-literacy for unlocking the potential for efficient, effective, and responsible use of ICTs in education and society as a whole.

  An interesting point brought up by Group B was the concern that "students know more than teachers" with regard to ICT use. While I think it is a fair concern, I sense that the current climate of 21st century education is one where both students and teachers are in need of knowledge and practice on e-literacy. When teacher candidate participants were asked: *Do you think a teacher education institution should include e-literacy within its curriculum?* The overwhelming response was "Yes," with 97.62%. I believe these participants recognize the need for responsible ICT use in education, not because they were filling out a survey on e-literacy, but because they recognize the current ubiquity of technology is not being met with the appropriate response. In preparing students for the future, Ontario (2014) claims,

> By being more engaged, our young people can be more successful in literacy, mathematics, science and the arts. They can gain important higher-order skills… All this will help them graduate from high school and advance to postsecondary careers, education and/or training. (p. 4)

Even though Ontario is striving to prepare students for the future, its curricula is currently playing catch-up to the proliferation of ICT use.

  Perhaps Participant 3c-7 put this situation into better words than I can:

  I believe that the ministry [of education in Ontario] must entrench this responsibility

into the curriculum and make it part of the educational programs[…]. Teachers

should understand, practice and model the responsible use of ICTs to students

because otherwise nobody will.

The problem is that curricular documents and policies are gradually being revised and

implemented. As a result, teacher education institutions may be lagging behind curricular

updates as well. If this trend continues, new teachers will continue to graduate from teacher

education institutions without proper training on e-literacy knowledge and practice. As such,

K-12 students will continue to receive inadequate instruction on the 21st century issue of

responsible ICT use. The good news is that as of the 2015-2016 academic year, teacher

education institutions across Ontario are expanding some of their Bachelor of Education

programmes from one year to two. This transition is a perfect opportunity to not only update

cross-curricular and interdisciplinary approaches to ICTs, but also to branch out from

capability-centric instructional technology courses.

In fact, until post-secondary education in Ontario is free, I recognize that the theory

of e-literacy represents an economic and prestigious advantage to the first institution to adopt

it. The improvement of 21st century teacher education directly contributes to the development

of educators, and students naturally seek out the best school to spend their tuition dollars. It's

a win-win situation because the institution that offers the best approaches to 21st century

teacher education draws higher enrolment rates, and teacher candidates who attend an

institution that prepares them accordingly have increased potential for practicing, modelling,

and teaching students about the responsible use of ICTs.

I fear that my emphasis on e-literacy may come across as proud, or as *my* idea, so I'll

temper that appearance with these final words: Like traditional literacy, e-literacy is for

everyone – now and in the future. It matters not what the term is, as long as it is centered on

the issue of responsible use. I chose the term "e-literacy" because I see it as the following

relationship: literacy is to learning as e-literacy is to e-learning. As ICT devices and infrastructure continue to improve and proliferate, the shadow of a technologically illiterate and irresponsible populace threatens the very idea of knowledge economies and societies. Like literacy in the days of yore, e-literacy will eventually reach higher numbers of people. But how long will it take, and who will it include? The opportunity for Ontario and for teacher education institutions to take charge on this front appeared sometime in the late-20th century when technology really began to enter our everyday lives. Let's not wait until the turn of the next century to do something about it.

APPENDIX A: LETTER OF PERMISSION TO THE DEAN

Dr. [name]
Faculty of [removed]
401 Sunset Ave.
Windsor, ON
N9B 3P4

19 March 2015

Dear Dr. [name],

I am writing to request the approval of a research study to be conducted within the [location] during the Winter 2015 semester. The study entitled "**e-Literacy and Trends in Ontario's 21st Education: Successes, Challenges, and Possibilities**" will be used as the foundation for my thesis requirement in the Master's programme.

This study will conduct research within the [location] to investigate the following research questions: (1) Is the Ontario K-12 curriculum incorporating international benchmarks of e-literacy education and addressing them in 21st century revisions?, (2) Do teacher education programmes require theoretical and practical applications of e-literacy proficiency for in-class and practicum assessment?, and (3) What are the lived experiences of teacher candidates with respect to learning and integrating e-literacy theory and pedagogy in the teacher education programmes? Teacher candidates present during the Winter 2015 semester will be invited to voluntarily participate in a survey questionnaire and/or a focus group discussion. Protection of participant identity and confidentiality are a priority during all processes and at all stages of this study.

This research will require the use of class time. This class time will be negotiated with individual course instructors for the teacher education programme in the [location]. I will contact them with a copy of the "Letter of Permission to Teacher Educators" (attached).

Please note that the research results might illuminate strengths and areas of improvement within the teacher education programme.

I have also attached the research instruments to be used in the study, specifically, the survey questionnaire and an outline of the focus group discussion questions.

If you have any questions or concerns regarding this study or the instruments that will be used, please contact me by email [removed]. You may also contact my supervisor, Dr. [name], by email [removed].

The REB has granted conditional clearance pending your approval of this project.

Thank you for considering my request to complete this research.

Respectfully,

Nathan Briffa
Principal Investigator

University of Windsor

APPENDIX B: LETTER OF PERMISSION TO COURSE INSTRUCTORS

Dear Course Instructor,

Nathan Briffa, a graduate is conducting a research study entitled "**e-Literacy and Trends in Ontario's 21st Education: Successes, Challenges, and Possibilities**." For aims of the study and information about the guiding research questions, please refer to the "Recruitment Invitation for Survey Questionnaire" and the "Recruitment Invitation for Focus Groups" (both attached).

This project has received clearance from the Dean and the Research Ethics Board.

The purpose of this letter is to request permission granting access to teacher candidates (Bachelor of Education students) during your class time to recruit their participation for data collection. Nathan Briffa requests <u>one</u> classroom visit for survey questionnaire and for focus group recruitment. The time required for this recruitment announcement is about 5-10 minutes, including an opportunity for students to ask questions related to the research.

There will be no data collection during this announcement. The survey questionnaire will be administered online, through an email that will be sent with a link to all current Bachelor of Education students. A later email will be sent out to notify students about the opportunity to volunteer for focus group discussions and a schedule with dates and times.

Please keep this letter for your own information. If you agree to grant access to your class, please see the original email that attached this letter and reply to Nathan with your name, the course number(s), date(s) and time(s), as well as which programme(s) your class is made up of (P/J, J/I, I/S and/or Concurrent). If you do not wish to grant access, there is no need to reply.

If you have any questions or concerns regarding this study or the instruments that will be used, please contact Nathan Briffa by email [removed].

Thank you for considering my request to complete this research.

Respectfully,

Nathan Briffa
Principal Investigator

APPENDIX C: SURVEY QUESTIONNAIRE

e-Literacy and Trends in Ontario's 21st Century Education: Successes, Challenges, and Possibilities

This project has received clearance from the **Dean of [removed]** and the **Research Ethics Board**.

Please check off the most appropriate option and/or fill in the requested information.

Section 1: Participant Data

1a. Please state your gender: _____

1b. Select an age range that describes you:

- □   20-29
- □   30-39
- □   40+
- □   I'd rather not.

1c. Select the option that best reflects your English language ability:

- □   English is my first language.
- □   English is not my first language, but I have used it for academic studies for more than 10 years.
- □   English is not my first language, but I have used it for academic studies for more than 5 years.
- □   English is not my first language, but I have used it for academic studies for less than 5 years.

Section 2: Educational Context

2a. Educational background: (Fill in all that apply)

I have a Bachelor's degree in   _____

I have a Master's degree in   _____

I have a Doctorate degree in   _____

Other: _____

2b. Which teacher education programme are you currently enrolled in?

- □ Consecutive – Primary/Junior   (P/J)
- □ Consecutive – Junior/Intermediate   (J/I)
- □ Consecutive – Intermediate/Senior   (I/S)
- □ Concurrent

2c. What is/are your teachable subject(s)? (if applicable)

_____

Section 3: Accessing the Internet

> In this survey, the term **ICT** (information and communication technology) refers to any digital device/application used (a) to access, retrieve, and create content, and (b) as a medium for users to communicate with each other.

3a. For school, how often do you use the Internet for information or communication purposes?

- □ More than 3 times a day.
- □ 3 times a day.
- □ Daily
- □ Weekly
- □ Monthly

3b. Outside of school work, how often do you use the Internet for information or communication purposes?

- □ More than 3 times a day.
- □ 3 times a day.
- □ Daily
- □ Weekly
- □ Monthly
- □ Never

3c. If you access the Internet, what device(s) do you use? (Check all that apply)

- □ Computer/laptop
- □ Tablet (including e-readers)

□　Smart phone

□　Gaming console

□　MP3 player

□　Other (please specify):

_____

_____

**3d. Rate your overall ability using information and communication technologies (ICTs)
to access content on the Internet:**

□　I can use technology without assistance whenever I need to.

□　I need minimal assistance when using technology.

□　I need a lot of assistance when using technology.

□　I cannot use technology without assistance.

3e. When you access the Internet, what do you use it for? (Check all that apply)

□　Retrieve information (look information up, access media such as images, videos, music, software)

□　Disseminate information (create, upload, or contribute information such as images, videos, music, software)

□　Send/receive email

□　Audio/video chat

□　Text chat

□　Access social networking sites

□　Browse/purchase merchandise

□　Play games

□　Other (please specify):

_____

_____

Section 4: e-Literacy

In this survey, the term **e-literacy** refers to four aspects that comprise a responsible Internet user (e-citizen). The four aspects include:

Capability:
- the ability to operate ICT-based hardware and software, as well as demonstrate the ability to operate across a range of platforms, programmes, and user-interfaces.

- derived from traditional computer science curricula

Critical literacy:
- ability to critically engage media to recognize, analyze, and understand perspective, bias, and underlying meaning; critical literacy skills applied to ICTs promote responsible media consumption.
- derived from arts and language arts curricula

Citizenry & ethics:
- notions of citizenry and ethics in the physical world should apply to virtual societies/communities in a similar way; under democratic education for all, schools are responsible for preparing students with the skills necessary for life in a future society.
- derived from social studies curricula

Safety:
- similar to physical environments, virtual environments present real dangers that threaten the safety of ICT users; students need to be knowledgeable about the different types of dangers and need to be equipped with prevention and protection techniques for online settings.
- derived from a range of educational safety programmes

Please indicate your level of agreement with the following statements:

4a. e-Literacy should be included in K-12 education.

        □ Strongly Disagree

        □ Disagree

        □ Unsure

        □ Agree

        □ Strongly Agree

    Feel to comment on your answer:

_____

4b. Parents should have the primary responsibility of teaching e-literacy skills to children.

        □ Strongly Disagree

        □ Disagree

        □ Unsure

        □ Agree

        □ Strongly Agree

    Feel to comment on your answer:

_____

4c. It is the responsibility of K-12 teachers to understand, practice, and model the responsible use of ICTs to students.

□ Strongly Disagree

□ Disagree

□ Unsure

□ Agree

□ Strongly Agree

Feel to comment on your answer:

_____

4d. e-Literacy curriculum is best integrated through cross-curricular and interdisciplinary methods, instead of as its own subject.

□ Strongly Disagree

□ Disagree

□ Unsure

□ Agree

□ Strongly Agree

Feel to comment on your answer:

_____

4e. If schools do not have access to a wide range of ICTs, they should not have to teach about e-literacy.

□ Strongly Disagree

□ Disagree

□ Unsure

□ Agree

□ Strongly Agree

Feel to comment on your answer:

_____

4f. e-Literacy should not be included in 21st century teacher education programmes.

□ Strongly Disagree

□ Disagree

□ Unsure

□ Agree

□ Strongly Agree

Feel to comment on your answer:

_____

4g. e-Literacy should be included in the on-going professional development of in-service teachers (teachers currently employed).

□ Strongly Disagree

□ Disagree

□ Unsure

□ Agree

□ Strongly Agree

Feel to comment on your answer:

_____

4h. Teacher education institutions should be responsible for developing proactive policy aimed at integrating e-literacy into teacher education.

□ Strongly Disagree

□ Disagree

□ Unsure

□ Agree

□ Strongly Agree

Feel to comment on your answer:

_____

4i. Teachers equipped with e-literacy skills are more effective educators than teachers without these skills.

□ Strongly Disagree

□ Disagree

□ Unsure

□ Agree

□ Strongly Agree

Feel to comment on your answer:

_____

4j. It is important for teacher candidates (Bachelor of Education students) to learn about e-literacy in teacher education programmes.

□ Strongly Disagree

□ Disagree

□ Unsure

□ Agree

□ Strongly Agree

Feel to comment on your answer:

_____

4k. It is not necessary for teacher educators (course instructors) to expose teacher candidates to e-literacy pedagogy and practices.

□ Strongly Disagree

☐ Disagree

☐ Unsure

☐ Agree

☐ Strongly Agree

Feel to comment on your answer:

_____

4l. Teacher education institutions should be required to equip teacher candidates with not just e-literacy theory, but e-literacy pedagogy as well.

☐ Strongly Disagree

☐ Disagree

☐ Unsure

☐ Agree

☐ Strongly Agree

Feel to comment on your answer:

_____

4m. I feel that the teacher education programme at the University of Windsor adequately addresses my e-literacy needs.

☐ Strongly Disagree

☐ Disagree

☐ Unsure

☐ Agree

☐ Strongly Agree

Feel to comment on your answer:

_____

Section 5: The Teacher Education Programme

5a. Is there a "Learning with Technologies" or "Instructional Technology" course (05-80-312, 05-80-322, or 05-80-332) required for your programme?

☐ Yes

☐ No

☐ Unsure

5b. If you *have completed* or *are currently taking* either technology course, did it provide any instruction on e-literacy theory and/or practice?

☐ Yes

□　No

□　I have not taken either of these courses.

Please elaborate:

_____

5c. In practicum formative and summative assessment reports, the "Teaching Practice" section measures a teacher candidate's ability to "Use technology effectively." Do you think this measurement reflects the needs of teacher candidates with respect to e-literacy?

□　Yes

□　No

Please elaborate:

_____

5d. Do you think a teacher education institution should include e-literacy within its curriculum?

□　Yes

□　No

5e. Do you think that proficiency with e-literacy should be included in practicum assessment requirements?

□　Yes

□　No

5f. Concerning K-12 education and e-literacy, do you think your teacher education institution is providing adequate instruction to teacher candidates?

□　Yes

□　No

Please elaborate:

_____

APPENDIX D: FOCUS GROUP DISCUSSION OUTLINE

e-Literacy and Trends in Ontario's 21st Century Education: Successes, Challenges, and Possibilities

This project has received clearance from the Dean of [removed] and the Research Ethics Board.

e-Literacy

The term **e-literacy** refers to four aspects that comprise a responsible Internet user (e-citizen) in offline and online environments. The four aspects include:

Capability:
- the ability to operate ICT-based hardware and software
- the ability to demonstrate the ability to operate across a range of platforms, programmes, and user-interfaces.

Critical literacy:
- ability to critically engage media to recognize, analyze, and understand perspective, bias, and underlying meaning
- applied to ICTs, critical literacy promotes responsible media consumption.

Citizenry & ethics:
- citizenry and ethics in the physical world should apply to virtual societies/communities in a similar way
- under democratic education for all, schools are responsible for preparing students with the skills necessary for life in a future society.

Safety:
- similar to physical environments, virtual environments present real dangers that threaten the safety of ICT users
- students need to be knowledgeable about the different types of dangers and need to be equipped with prevention and protection techniques for online settings.

Icebreaker
- Why did you become a teacher candidate?

Online and Offline Environments
- How often do you use the Internet and what for?

- Think about your interactions with people over the Internet: what's the first thing that comes to mind?
- During your placements, in what kind of scenarios did you see students using ICTs?

Teacher Education
- To what extent did you learn about the responsible use of ICTs in your courses?
- How comfortable are you teaching students about responsible ICT use?

(two-thirds mark)

- Did you have to use ICTs during any of your demonstration lessons while on placement?
- The title of this research focuses on "Successes, Challenges, and Possibilities": Reflecting on your experiences as a teacher candidate, how you would improve the technology-related parts of your
  - in-class studies
  - and practicum experiences
- What are some of your concerns about teaching e-literacy or ICT use to K-12 students?

Conclusion
- Is there anything we missed? Or anything you didn't get a chance to say before?

University of Windsor

APPENDIX E: RECRUITMENT INVITATION FOR SURVEY QUESTIONNAIRE

Dear Teacher Candidates,

Nathan Briffa, a graduate student is conducting a research study entitled, "**e-Literacy and Trends in Ontario's 21st Education: Successes, Challenges, and Possibilities**." This study aims to examine the following research questions: (1) Is the Ontario K-12 curriculum incorporating international benchmarks of e-literacy education and addressing them in 21st century revisions?, (2) Do teacher education programmes require theoretical and practical applications of e-literacy proficiency for in-class and practicum assessment?, and (3) What are the lived experiences of teacher candidates with respect to learning and integrating e-literacy theory and pedagogy in the teacher education programmes? The goal of this research is to examine the needs, challenges, and successes found in your experiences at an institution for 21st century teacher education.

Volunteers are an integral part of the data collection process: they help determine the success of the research through quality input, and allow researchers to produce useful studies that continue to build our knowledge.

You are cordially invited to complete the online survey questionnaire. A link to the survey can be found in the email accompanying this letter.

If you have any questions about this research please contact Nathan by email [removed]. Thank you for your time.

This project has received clearance from the Dean of [removed] and the Research Ethics Board.

Respectfully,

Nathan Briffa
Principal Investigator

APPENDIX F: RECRUITMENT INVITATION FOR FOCUS GROUPS

Dear Teacher Candidates,

Nathan Briffa, a graduate student is conducting a research study entitled, "**e-Literacy and Trends in Ontario's 21ˢᵗ Education: Successes, Challenges, and Possibilities**." This study aims to examine the following research questions: (1) Is the Ontario K-12 curriculum incorporating international benchmarks of e-literacy education and addressing them in 21ˢᵗ century revisions?, (2) Do teacher education programmes require theoretical and practical applications of e-literacy proficiency for in-class and practicum assessment?, and (3) What are the lived experiences of teacher candidates with respect to learning and integrating e-literacy theory and pedagogy in the teacher education programmes? The goal of this research is to examine the needs, challenges, and successes found in your experiences at an institution for 21ˢᵗ century teacher education.

Volunteers are an integral part of the data collection process: they help determine the success of the research through quality input, and allow researchers to produce useful studies that continue to build our knowledge.

You are cordially invited to participate in the focus group discussions.

To volunteer for a focus group, refer to the schedule included in the accompanying email and/or the "Letter of Information for Consent to Participate in Focus Group Discussions." Please attend a focus group that suits your schedule.

If you have any questions about this research please contact Nathan by email [removed]. Thank you for your time.

This project has received clearance from the Dean of [removed] and the Research Ethics Board.

Respectfully,

Nathan Briffa
Principal Investigator

University of Windsor

APPENDIX G: LETTER OF CONSENT TO PARTICIPATE IN SURVEY QUESTIONNAIRE

TITLE OF THE STUDY
e-Literacy and Trends in Ontario's 21st Education: Successes, Challenges, and Possibilities

You are requested to participate in a research study conducted by Nathan Briffa, a Master's student. The following survey questionnaire aims to identify factors of e-literacy in the context of 21st century education by examining the lived experiences of teacher candidates.

This project has received clearance from the Dean of [removed] and the Research Ethics Board.

If you have any questions or concerns about the research, please feel free to contact Nathan Briffa. He can be reached by email [removed].

PURPOSE OF THE STUDY
The study is intended to examine the following research questions: (1) Is the Ontario K-12 curriculum incorporating international benchmarks of e-literacy education and addressing them in 21st century revisions?, (2) Do teacher education programmes require theoretical and practical applications of e-literacy proficiency for in-class and practicum assessment?, and (3) What are the lived experiences of teacher candidates with respect to learning and integrating e-literacy theory and pedagogy in the teacher education programmes?

PROCEDURES
If you volunteer to participate in the survey, please complete and return the accompanying questionnaire.

POTENTIAL RISKS AND DISCOMFORTS
There may be previous relationships between the researcher, Nathan Briffa, and potential volunteers. Please do not feel obligated to participate due to any past and/or present relationship with Nathan Briffa.

If this survey is to be completed during class time, there may be social and psychological risks associated with being identified as a participant. Please respect the decision of others regarding their choice to participate or not.

POTENTIAL BENEFITS FOR PARTICIPANTS AND/OR TO SOCIETY There are no potential benefits for survey questionnaire participants.

This study aims to benefit the scholarly community by extending the literature in the following ways: reshaping teacher education ideology, structure, and practices to meet the demands of the 21st century; contributing to the academic conversation of e-literacy theory

and practice; developing a methodologically sound approach to integrating e-literacy into 21st century K-12 curricula; and promoting a paradigm-shift towards strategies that focus on improving andragogy (adult education) in teacher education in order to improve pedagogy in K-12 classrooms. Additionally, individuals responsible for the design and curriculum of a new two-year bachelor of Education programme (commencing Fall 2015) may benefit from the analysis of current teacher candidate experiences related to ICT and e-literacy based teaching and learning.

COMPENSATION FOR PARTICIPATION
There will be no compensation for participating in the survey questionnaire**.**

CONFIDENTIALITY
The survey questionnaire is designed to protect participant identity, so please do not enter any information that may help to identify yourself anywhere on the survey. Any information that can be identified with you that is obtained in connection with this study will remain confidential and will be disclosed only with your permission.

PARTICIPATION AND WITHDRAWAL
It is your choice to be involved in this study. If you volunteer to participate in this survey, you may withdraw at any time without consequence of any kind. You may also refuse to answer any questions you do not want to answer in the questionnaire, and still remain in the study.

Any withdrawal from the survey must be done before the questionnaire is submitted. The survey requires no identifying markers, so there will be no way to identify individual participants after the questionnaire is submitted. After the point of submission, withdrawal is impossible.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE PARTICIPANTS
Due to the steps taken to protect participant identity, the researcher will not be able to contact participants, thus participants will not be informed of study results.

SUBSEQUENT USE OF DATA
Data collected for this study may be used in subsequent studies, in publications, and in presentations.

RIGHTS OF RESEARCH PARTICIPANTS
If you have any questions regarding your rights as a research participant, please contact: Research Ethics Coordinator [removed].

SIGNATURE OF INVESTIGATOR
These are the terms under which I will conduct research.

Nathan Briffa
Principal Investigator

APPENDIX H: LETTER OF CONSENT TO PARTICIPATE IN FOCUS GROUP DISCUSSIONS

TITLE OF THE STUDY
e-Literacy and Trends in Ontario's 21st Education: Successes, Challenges, and Possibilities

You are requested to participate in a research study conducted by Nathan Briffa, a Master's student. The purpose of the focus group discussions is to identify factors of e-literacy in the context of 21st century education by examining the lived experiences of teacher candidates.

This project has received clearance from the Dean of [removed] and the Research Ethics Board.

If you have any questions or concerns about the research, please feel free to contact Nathan. He can be reached by email [removed].

PURPOSE OF THE STUDY
The study is intended to examine the following research questions: (1) Is the Ontario K-12 curriculum incorporating international benchmarks of e-literacy education and addressing them in 21st century revisions?, (2) Do teacher education programmes require theoretical and practical applications of e-literacy proficiency for in-class and practicum assessment?, and (3) What are the lived experiences of teacher candidates with respect to learning and integrating e-literacy theory and pedagogy in the teacher education programmes?

PROCEDURES
If you wish to volunteer to participate in a focus group discussion, please sign and return this consent form and the "Consent for Audio Recording Form" (attached).

POTENTIAL RISKS AND DISCOMFORTS
There may be previous relationships between the researcher, Nathan Briffa, and potential volunteers. Please do not feel obligated to participate due to any past and/or present relationship with Nathan Briffa.

Focus groups are group events and have increased risks. During the focus group discussion, there may be social and/or psychological pressures to answer questions in particular ways based on the views of other participants. To reduce these risks, all participants will be asked to respect the opinions of others.

There may be social and psychological risks associated with being identified as a participant. Please respect the decision of others regarding their choice to participate or not. The focus group is a group event. There is always the possibility that sensitive information will be revealed in group activities. This means that while confidentiality of all information given by the participants will be protected by the researchers, this information will be heard by all the

participants and therefore will not be strictly confidential.

Confidentiality will be protected through the use of pseudonyms, only the audio content of the discussions will be digitally recorded, and all group input will be transcribed as one collective opinion.

POTENTIAL BENEFITS FOR PARTICIPANTS AND/OR TO SOCIETY
There are no potential benefits for focus group participants.

This study aims to benefit the scholarly community by extending the literature in the following ways: reshaping teacher education ideology, structure, and practices to meet the demands of the 21st century; contributing to the academic conversation of e-literacy theory and practice; developing a methodologically sound approach to integrating e-literacy into 21st century K-12 curricula; and promoting a paradigm-shift towards strategies that focus on improving andragogy (adult education) in teacher education in order to improve pedagogy in K-12 classrooms. Additionally, individuals responsible for the design and curriculum of the new two-year bachelor of Education programme (commencing Fall 2015) may benefit from the analysis of current teacher candidate experiences related to ICT and e-literacy based teaching and learning.

COMPENSATION FOR PARTICIPATION
There will be no compensation for participating in focus group discussions.

CONFIDENTIALITY
Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed with only your permission.

Focus groups are group events and have increased risks. Focus group methodology carries with it implications for confidentiality. These risks have been mitigated through the use of pseudonyms during the focus group discussions and by transcribing all group input as one collective opinion.

Raw data will only be accessible to Nathan Briffa (primary researcher) and Dr. [removed] (supervisor), neither of whom present dual-role conflicts to potential participants.

PARTICIPATION AND WITHDRAWAL
You can choose whether to be involved in a focus group. If you volunteer to be in a focus group, you may withdraw at any time without consequences of any kind. Participants will not be able to withdraw data already provided to the focus group prior to the point of withdrawal. You may also refuse to answer any questions you do not want to answer in the focus group, and still remain in the study.

The audio recordings of the focus group will be transcribed without identifying individuals, so if you decide to withdraw from the focus group before the discussion starts, you can do so by leaving the room. During the course of the discussion, you can withdraw by leaving the group at any time. Once the discussion is completed, participants cannot withdraw their data, as it would be very hard to identify and delete each participant's input due to the nature of the audio recorded discussions.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE PARTICIPANTS
Due to the steps taken to protect participant identity, the researcher will not be able to contact participants, thus participants will not be informed of study results.

SUBSEQUENT USE OF DATA
Data collected for this study may be used in subsequent studies, in publications, and in presentations.

RIGHTS OF RESEARCH PARTICIPANTS
If you have any questions regarding your rights as a research participant, please contact: Research Ethics Coordinator [removed].

SIGNATURE OF RESEARCH PARTICIPANT/LEGAL REPRESENTATIVE
I understand the information provided for the study **"e-Literacy and Trends in Ontario's 21st Education: Successes, Challenges, and Possibilities"** as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of the "Letter of Information for Consent to Participate in Focus Group Discussions."

_____   _____
Participant's Initials   Date

SIGNATURE OF INVESTIGATOR
These are the terms under which I will conduct research.

Nathan Briffa
Principal Investigator

APPENDIX I: LETTER OF INFORMATION FOR CONSENT TO PARTICIPATE IN SURVEY QUESTIONNAIRE

TITLE OF THE STUDY
e-Literacy and Trends in Ontario's 21st Education: Successes, Challenges, and Possibilities

You are requested to participate in a research study conducted by Nathan Briffa, a Master's student. The following survey questionnaire aims to identify factors of e-literacy in the context of 21st century education by examining the lived experiences of teacher candidates.

This project has received clearance from the Dean of [removed] and the Research Ethics Board.

If you have any questions or concerns about the research, please feel free to contact Nathan. He can be reached by email [removed].

PURPOSE OF THE STUDY
The study is intended to examine the following research questions: (1) Is the Ontario K-12 curriculum incorporating international benchmarks of e-literacy education and addressing them in 21st century revisions?, (2) Do teacher education programmes require theoretical and practical applications of e-literacy proficiency for in-class and practicum assessment?, and (3) What are the lived experiences of teacher candidates with respect to learning and integrating e-literacy theory and pedagogy in the teacher education programmes?

PROCEDURES
If you volunteer to participate in the survey, please click on the link in the email from the Education Office and complete the online survey.

POTENTIAL RISKS AND DISCOMFORTS
Please do not feel obligated to participate due to any past and/or present relationship with Nathan Briffa.

POTENTIAL BENEFITS FOR PARTICIPANTS AND/OR TO SOCIETY
There are no potential benefits for survey questionnaire participants.

This study aims to benefit the scholarly community by extending the literature in the following ways: reshaping teacher education ideology, structure, and practices to meet the demands of the 21st century; contributing to the academic conversation of e-literacy theory and practice; developing a methodologically sound approach to integrating e-literacy into 21st century K-12 curricula; and promoting a paradigm-shift towards strategies that focus on improving andragogy (adult education) in teacher education in order to improve pedagogy in K-12 classrooms. Additionally, individuals responsible for the design and curriculum of the new two-year bachelor of Education programme (commencing Fall 2015) may benefit from

the analysis of current teacher candidate experiences related to ICT and e-literacy based teaching and learning.

COMPENSATION FOR PARTICIPATION
There will be no compensation for participating in the survey questionnaire.

CONFIDENTIALITY
The survey questionnaire is designed to protect participant identity, so please do not enter any information that may help to identify yourself anywhere on the survey. Any information that can be identified with you that is obtained in connection with this study will remain confidential and will be disclosed only with your permission.

PARTICIPATION AND WITHDRAWAL
It is your choice to be involved in this study. If you volunteer to participate in this survey, you may withdraw at any time without consequence of any kind. You may also refuse to answer any questions you do not want to answer in the questionnaire, and still remain in the study.

Any withdrawal from the survey must be done before the questionnaire is submitted. The survey requires no identifying markers, so there will be no way to identify individual participants after the questionnaire is submitted. After the point of submission, withdrawal is impossible.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE PARTICIPANTS
Due to the steps taken to protect participant identity, the researcher will not be able to contact participants, thus participants will not be informed of study results.

SUBSEQUENT USE OF DATA
Data collected for this study may be used in subsequent studies, in publications, and in presentations.

RIGHTS OF RESEARCH PARTICIPANTS
If you have any questions regarding your rights as a research participant, please contact: Research Ethics Coordinator [removed].

SIGNATURE OF INVESTIGATOR
These are the terms under which I will conduct research.

Nathan Briffa
Principal Investigator

University of Windsor

APPENDIX J: LETTER OF INFORMATION FOR CONSENT TO PARTICIPATE IN FOCUS GROUP DISCUSSIONS

TITLE OF THE STUDY
e-Literacy and Trends in Ontario's 21st Education: Successes, Challenges, and Possibilities

You are requested to participate in a research study conducted by Nathan Briffa, a Master's student. The purpose of the focus group discussions is to identify factors of e-literacy in the context of 21st century education by examining the lived experiences of teacher candidates and teacher educators.

This project has received clearance from the Dean of [removed] and the Research Ethics Board.

If you have any questions or concerns about the research, please feel free to contact Nathan Briffa. He can be reached by email [removed].

PURPOSE OF THE STUDY
The study is intended to examine the following research questions: (1) Is the Ontario K-12 curriculum incorporating international benchmarks of e-literacy education and addressing them in 21st century revisions?, (2) Do teacher education programmes require theoretical and practical applications of e-literacy proficiency for in-class and practicum assessment?, and (3) What are the lived experiences of teacher candidates with respect to learning and integrating e-literacy theory and pedagogy in the teacher education programmes?

PROCEDURES
If you wish to volunteer to participate in a focus group discussion, please attend the corresponding focus group session (see below) and sign and submit the "Letter of Consent to Participate in Focus Group Discussions" form and the "Consent for Audio Recording Form" that will be provided on-site.

Schedule (TBD)	Date & Time	Education Building Room #
P/J		
J/I		
I/S		
Concurrent		

POTENTIAL RISKS AND DISCOMFORTS
There may be previous relationships between the researcher, Nathan Briffa, and potential volunteers. Please do not feel obligated to participate due to any past and/or present relationship with Nathan Briffa.

Focus groups are group events and have increased risks. During the focus group discussion, there may be social and/or psychological pressures to answer questions in particular ways based on the views of other participants. To reduce these risks, participants will be asked to respect the opinions of others.

There may be social and psychological risks associated with being identified as a participant. Please respect the decision of others regarding their choice to participate or not. The focus group is a group event. There is always the possibility that sensitive information will be revealed in group activities. This means that while confidentiality of all information given by the participants will be protected by the researchers, this information will be heard by all the participants and therefore will not be strictly confidential.

Confidentiality will be protected through the use of pseudonyms, only the audio content of the discussions will be digitally recorded, and all group input will be transcribed as one collective opinion.

POTENTIAL BENEFITS FOR PARTICIPANTS AND/OR TO SOCIETY
There are no potential benefits for focus group participants.

This study aims to benefit the scholarly community by extending the literature in the following ways: reshaping teacher education ideology, structure, and practices to meet the demands of the 21st century; contributing to the academic conversation of e-literacy theory and practice; developing a methodologically sound approach to integrating e-literacy into 21st century K-12 curricula; and promoting a paradigm-shift towards strategies that focus on improving andragogy (adult education) in teacher education in order to improve pedagogy in K-12 classrooms. Additionally, individuals responsible for the design and curriculum of the new two-year bachelor of Education programme (commencing Fall 2015) may benefit from the analysis of current teacher candidate experiences related to ICT and e-literacy based teaching and learning.

COMPENSATION FOR PARTICIPATION
There will be no compensation for participating in focus group discussions.

CONFIDENTIALITY
Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed with only your permission.

Focus groups are group events and have increased risks. Focus group methodology carries with it implications for confidentiality. These risks have been mitigated through the use of pseudonyms during the focus group discussions and by transcribing all group input as one collective opinion.

Raw data will only be accessible to Nathan Briffa (primary researcher) and Dr. [removed] (supervisor), neither of whom present dual-role conflicts to potential participants.

PARTICIPATION AND WITHDRAWAL
You can choose whether to be involved in a focus group. If you volunteer to be in a focus group, you may withdraw at any time without consequences of any kind. Participants will not

be able to withdraw data already provided to the focus group prior to the point of withdrawal. You may also refuse to answer any questions you do not want to answer in the focus group, and still remain in the study.

The audio recordings of the focus group will be transcribed without identifying individuals, so if you decide to withdraw from the focus group before the discussion starts, you can do so by leaving the room. During the course of the discussion, you can withdraw by leaving the group at any time. Once the discussion is completed, participants cannot withdraw their data, as it would be very hard to identify and delete each participant's input due to the nature of the audio recorded discussions.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE PARTICIPANTS
Due to the steps taken to protect participant identity, the researcher will not be able to contact participants, thus participants will not be informed of study results.

SUBSEQUENT USE OF DATA
Data collected for this study may be used in subsequent studies, in publications, and in presentations.

RIGHTS OF RESEARCH PARTICIPANTS
If you have any questions regarding your rights as a research participant, please contact: Research Ethics Coordinator [removed].

SIGNATURE OF INVESTIGATOR
These are the terms under which I will conduct research.

Nathan Briffa
Principal Investigator

APPENDIX K: CONSENT FOR AUDIO RECORDING FORM

TITLE OF THE STUDY
e-Literacy and Trends in Ontario's 21st Education: Successes, Challenges, and Possibilities

This project has received clearance from the Dean of [removed] and the Research Ethics Board.

I consent to the audio recording of the focus group discussion.

I understand that these are voluntary procedures, and I understand that I am free to withdraw at any time by requesting that the recording be stopped. I also understand that my name will not be revealed to anyone and that the audio records will be kept confidential.

The recordings will be filed by number and secured under password and in a locked location. The destruction of the audio recordings will be completed after transfer, transcription, and verification.

I understand that confidentiality will be respected and that the audio recordings will be for professional use only.

_____   _____

Participant's Initials   Date

References

Attride-Stirling, J. (2001). Thematic networks: An analytic tool for qualitative research. *Qualitative Research, 1*(3), 385-405. doi:10.1177/146879410100100307

Aucoin, R. C. (2011). Information and communication technologies in international education: A Canadian policy analysis. *International Journal of Education Policy and Leadership, 6*(4), 1-11. Retrieved on 5 May 2015, from http://journals.sfu.ca/ijepl/index.php/ijepl/article/view/215/109

Beggs, P. (2012). *A shifting landscape: Pedagogy, technology, and the new terrain of innovation in a digital world*. Curriculum Services Canada. Retrieved on 13 March 2015, from http://www.edugains.ca/resources21CL/Research/Research_PilotsforSystemLearning Report.pdf

Bouma, G. D., Ling, R., & Wilkinson, L. (2012). *The research process* (2nd Canadian ed.). Don Mills, Ontario: Oxford University Press.

Brown, J. S. (2000). Growing up digital: How the Web changes work, education, and the ways people learn. *Change: The Magazine of Higher Learning, 32*(2), 11-20. Retrieved on 18 September 18 2014, from http://www.johnseelybrown.com/Growing_up_digital.pdf

Burke, A., & Rowsell, J. (2007). Assessing multimodal learning practices. *E-learning, 4*(3), 329-342. Retrieved on 13 July 2015, from http://ldm.sagepub.com/content/4/3/329.full.pdf+html

Catfishing. (2013). In *Urban Dictionary*. Retrieved on 27 July 2015, from http://www.urbandictionary.com/define.php?term=Catfishing

Central Intelligence Agency. (2013a). Country comparison: Area. *The World Factbook 2013-14*. Washington, DC: Central Intelligence Agency. Retrieved on 13 June 2015, from

https://www.cia.gov/library/publications/the-world-

factbook/rankorder/2147rank.html

Central Intelligence Agency. (2013b). Country comparison: Population. *The World Factbook*

2013-14. Washington, DC: Central Intelligence Agency. Retrieved on 13 June 2015,

from https://www.cia.gov/library/publications/the-world-

factbook/rankorder/2119rank.html

Central Intelligence Agency. (2013c). References: Definitions and notes. *The World*

Factbook 2013-14. Washington, DC: Central Intelligence Agency. Retrieved on 13

June 2015, from https://www.cia.gov/library/publications/the-world-

factbook/docs/notesanddefs.html

Central Intelligence Agency. (2013d). *The World Factbook 2013-14*. Washington, DC:

Central Intelligence Agency. Retrieved on 13 June 2015, from

https://www.cia.gov/library/publications/resources/the-world-factbook

CML. (n.d.). About CML. Retrieved on 15 June 2015, from http://www.medialit.org/about-

cml

CML. (2011). Media literacy: A definition and more. Retrieved on 2 February 2015, from

http://www.medialit.org/media-literacy-definition-and-more

Creswell, J. W. (2012). *Educational research: Planning, conduction, and evaluating*

quantitative and qualitative research (4th ed.). Boston: Pearson Education, Inc.

Culver, S. H., & Jacobson, T. (2012). Media literacy and its use as a method to encourage

civic engagement. *Comunicar, 39*(20), 73-80. doi:10.3916/C39-2012-02-07

Dei, G. J. S. (2001). Rescuing theory: Anti-racism and inclusive education. *Race, Gender &*

Class, 8(1), 139-161. Available from http://www.jstor.org/stable/41674965

e-literacy. (2007). In *Urban Dictionary*. Retrieved on 29 July 2015, from

http://www.urbandictionary.com/define.php?term=e-literacy

ETS. (2002). *Digital transformation: A framework for ICT literacy*. Retrieved on 18

September 2014, from http://www.ets.org/Media/Research/pdf/ICTREPORT.pdf

ETS. (2005). *ICT literacy: Equipping students to succeed in an information-rich, technology-

based society*. Retrieved on 2 February 2015, from

http://www.ets.org/Media/Tests/ICT_Literacy/pdf/ICT_Equipping_Students_to_Succ

eed.pdf

ETS. (2015). About ETS. Retrieved on 5 May 2015, from https://www.ets.org/about

Evans, D., & Kowanko, I. (2000). Literature reviews: Evolution of a research methodology.

Australian Journal of Advanced Nursing, 18(2), 33-38. Retrieved on 28 July 2015,

from http://www.ajan.com.au/Vol18/Vol18.2-4.pdf

Freire, P. (2005). *Pedagogy of the oppressed* (M. B. Ramos, Trans.). New York: Continuum.

Froese-Germain, B. (2013). Reframing public education as a public good. *Canadian

Teachers' Federation*. Retrieved on 25 June 2015, from http://www.ctf-

fce.ca/Research-Library/Educationpublicgood.pdf

Gidney, R. D. (2002). *From Hope to Harris: The reshaping of Ontario's schools*. Toronto:

University of Toronto Press Incorporated.

Giroux, H. A. (2001). Pedagogy of the depressed: Beyond the new politics of cynicism.

College Literature, 28(3), 1-32. Available from http://www.jstor.org/stable/25112600

Haythornthwaite, C., & Andrews, R. (2011). *E-learning theory & practice*. London: SAGE

Publications Ltd.

Hilbert, M. (2009). When is cheap, cheap enough to bridge the digital divide? Modeling

income related structural challenges of technology diffusion in Latin America. *World

Development, 38*(5), 756-770. doi:10.1016/j.worlddev.2009.11.019

iKeepSafe Digital Citizenship C3 Matrix. (2009). Retrieved on 9 July 2015, from

http://www.edtechpolicy.org/C32012/Handouts/C3_matrix.pdf

ISTE. (2014a). *Essential conditions.* Retrieved on 18 September 2014, from

http://www.iste.org/docs/pdfs/netsessentialconditions.pdf?sfvrsn=2

ISTE. (2014b). *ISTE standards: Administrators.* Retrieved on 18 September 2014, from

http://www.iste.org/docs/pdfs/20-14_ISTE_Standards-A_PDF.pdf

ISTE. (2014c). *ISTE standards: Students.* Retrieved on 18 September 2014, from

http://www.iste.org/docs/pdfs/20-14_ISTE_Standards-S_PDF.pdf

ISTE. (2014d). *ISTE standards: Teachers.* Retrieved on 18 September 2014, from

http://www.iste.org/docs/pdfs/20-14_ISTE_Standards-T_PDF.pdf

ISTE. (2015a). About ISTE. Retrieved on 8 August 2015, from http://www.iste.org/about

ISTE. (2015b) ISTE standards. Retrieved on 8 August 2015, from

http://www.iste.org/standards

ITU. (2014). *The world in 2014: ICT facts and figures*. Retrieved on 18 September 2014,

from http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2014-

e.pdf

Kelly, K. (2009). Technology's epic story [Video file]. Retrieved on 1 July 2015, from

http://www.ted.com/talks/kevin_kelly_tells_technology_s_epic_story

Krathwohl, D. R. (2002). A revision of Bloom's Taxonomy: An overview. *Theory into*

Practice, 41(4), 212-218. Available from http://www.jstor.org/stable/1477405

Kraut, R., Olson, J., Banji, M., Bruckman, A., Cohen, J., & Couper, M. (2004). Psychological

research online: Report of Board of Scientific Affairs' Advisory Group on the

conduct of research on the Internet. *American Psychologist, 59*(2), 105-117.

doi:10.1037/0003-066X.59.2.105

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*.

Cambridge: Cambridge University Press.

Luke, A. (2012). Critical literacy: Foundational notes. *Theory Into Practice, 51,* 4-11.

    doi:10.1080/00405841.2012.636324

Luu, K., & Freeman, J. G. (2011). An analysis of the relationship between information and

    communication technology (ICT) and scientific literacy in Canada and Australia.

    Computers & Education, 56, 1072-1082. Available from

    http://journals1.scholarsportal.info.ezproxy.uwindsor.ca/pdf/03601315/v56i0004/107

    2_aaotrbslicaa.xml

Mäkinen, M. (2006). Digital empowerment as a process for enhancing citizens' participation.

    E-learning, 3(3), 381-393. Retrieved on 17 July 2015, from

    http://ldm.sagepub.com/content/3/3/381.full.pdf+html

Milton, J. (2008). Areopagitica. In *John Milton: The major works* (pp. 236-273). New York:

    Oxford University Press, Inc.

NCTE. (1990). Mission statement. Retrieved on 14 July 2015, from

    http://www.ncte.org/mission

NCTE. (2013). NCTE framework for 21st century curriculum and assessment. Retrieved 11

    October 2014, from

    http://www.ncte.org/library/NCTEFiles/Resources/Positions/Framework_21stCent_C

    urr_Assessment.pdf

NMC. (n.d.). NMC history. Retrieved on 13 June 2015, from

    http://www.nmc.org/about/nmc-history

NMC. (2005). *A global imperative: The report of the 21st century literacy summit.* Retrieved

    on 19 April 2014, from http://www.nmc.org/pdf/Global_Imperative.pdf

Noddings, N. (2005). What does it mean to educate the whole child? *Educational*

    Leadership, 63(1), 8-13.

Noddings, N. (2007). Aims, goals, and objectives. *Encounters on Education, 8*, 7-15.

Ogwo, B. A. (2011). E-literacy skills and programme improvement in the informal sector market/mechanic village schools in south eastern Nigeria. *NORRAG News, Towards a New Global World of Skills Development? TVET's turn to Make its Mark* (46), 96-97. Retrieved on 9 August 2015, from http://www.norrag.org/en/publications/norrag-news/online-version/towards-a-new-global-world-of-skills-development-tvets-turn-to-make-its-mark/detail/e-literacy-skills-and-programme-improvement-in-the-informal-sector-marketmechanic-village-schools-i.html

Ontario. (2006). *The Ontario curriculum, grade 1-8: Language (revised)*. Retrieved on 8 August 2015, from

http://www.edu.gov.on.ca/eng/curriculum/elementary/language18currb.pdf

Ontario. (2007a). *The Ontario curriculum, grade 1-8: Science and technology (revised)*. Retrieved on 8 August 2015, from

http://www.edu.gov.on.ca/eng/curriculum/elementary/scientec18currb.pdf

Ontario. (2007b). *The Ontario curriculum, grades 9 and 10: English (revised)*. Retrieved on 8 August 2015, from

https://www.edu.gov.on.ca/eng/curriculum/secondary/english910currb.pdf

Ontario. (2007c). *The Ontario curriculum, grades 11 and 12: English (revised)*. Retrieved on 8 August 2015, from

https://www.edu.gov.on.ca/eng/curriculum/secondary/english1112currb.pdf

Ontario. (2008). *The Ontario curriculum, grades 10 to 12: Computer studies (revised)*. Retrieved on 8 August 2015, from

https://www.edu.gov.on.ca/eng/curriculum/secondary/computer10to12_2008.pdf

Ontario. (2009a). *The Ontario curriculum, grades 9 and 10: Technological education (revised)*. Retrieved on 8 August 2015, from

https://www.edu.gov.on.ca/eng/curriculum/secondary/teched910curr09.pdf

Ontario. (2009b). *The Ontario curriculum, grades 11 and 12: Technological education (revised)*. Retrieved on 8 August 2015, from

https://www.edu.gov.on.ca/eng/curriculum/secondary/2009teched1112curr.pdf

Ontario. (2010a). *Growing success: Assessment, evaluation, and reporting in Ontario schools (First edition, covering grades 1 to 12)*. Retrieved on 8 August 2015, from

https://www.edu.gov.on.ca/eng/policyfunding/growSuccess.pdf

Ontario. (2010b). *The full-day early learning – kindergarten program (draft version)*. Retrieved on 8 August 2015, from

http://www.edu.gov.on.ca/eng/curriculum/elementary/kindergarten_english_june3.pdf

Ontario. (2013a). *The Ontario curriculum, social studies, grades 1-6; history and geography, grades 7 and 8 (revised)*. Retrieved on 8 August 2015, from

http://www.edu.gov.on.ca/eng/curriculum/elementary/sshg18curr2013.pdf

Ontario. (2013b). *The Ontario curriculum, grades 9 and 10: Canadian and world studies (revised)*. Retrieved on 8 August 2015, from

https://www.edu.gov.on.ca/eng/curriculum/secondary/canworld910curr2013.pdf

Ontario. (2014). *Achieving excellence: A renewed vision for education in Ontario*. Retrieved on 8 August 2015, from http://www.edu.gov.on.ca/eng/about/renewedVision.pdf

Ontario. (2015a). *The Ontario curriculum, grades 1-8: Health and physical education (revised)*. Retrieved on 8 August 2015, from

http://www.edu.gov.on.ca/eng/curriculum/elementary/health1to8.pdf

Ontario. (2015b). *The Ontario curriculum, grades 9 to 12: Health and physical education (revised)*. Retrieved on 8 August 2015, from

https://www.edu.gov.on.ca/eng/curriculum/secondary/health9to12.pdf

Ontario. (2015c). *The Ontario curriculum, grades 11 and 12: Canadian and world studies (revised)*. Retrieved on 8 August 2015, from

https://www.edu.gov.on.ca/eng/curriculum/secondary/2015CWS11and12.pdf

P21. (2009). P21: Framework definitions. Retrieved on 11 October 2014, from

http://www.p21.org/storage/documents/P21_Framework_Definitions.pdf

P21: Our history. (n.d.). Retrieved on 11 October 2014, from http://www.p21.org/about-us/our-history

P21: Our vision and mission. (n.d.). Retrieved on 11 October 2014, from

http://www.p21.org/about-us/our-mission

Peterson, S. S, & McClay, J. K. (2012). Assumptions and practices in using digital technologies to teach writing in middle-level classrooms across Canada. *Literacy, 46*(3), 140-146. Available from

http://onlinelibrary.wiley.com.ezproxy.uwindsor.ca/doi/10.1111/j.1741-4369.2012.00665.x/epdf

Plato. (1997a). Laws (T. J. Saunders, Trans.). In J. M. Cooper & D. S. Hutchinson (Eds.), *Plato: Complete works* (pp. 1318-1616). Indianapolis: Hackett Publishing Company, Inc.

Plato. (1997b). Republic (G. M. A. Grube & C. D. C. Reeve, Trans.). In J. M. Cooper & D. S. Hutchinson (Eds.), *Plato: Complete works* (pp. 971-1223). Indianapolis: Hackett Publishing Company, Inc.

Poole, B. J. (2009). Chapter 12: Computers, education, and society. In B. J. Poole, E. Sky-McIlvain, J. Evans, & Y. Singer (Eds.), *Education for an information age: Teaching*

in the computerized classroom (7th ed.), (pp. 207-234). Retrieved on 9 July 2015, from http://www.pitt.edu/~poole/InfoAge7frame.html

Poole, B. J., & Sky-McIlvain. (2009). Chapter 8: E-learning and information literacy. In B. J. Poole, E. Sky-McIlvain, J. Evans, & Y. Singer (Eds.), *Education for an information age: Teaching in the computerized classroom* (7th ed.), (pp. 207-234). Retrieved on 9 July 2015, from http://www.pitt.edu/~poole/InfoAge7frame.html

Pruitt-Mentle, D. (n.d.). C3 framework promoting responsible use. Retrieved on 9 July 2015, from http://www.edtechpolicy.org/C32012/Handouts/C3_framework_overview_w_o.pdf

Pungente, J. J., Duncan, B., & Andersen, N. (2005). The Canadian experience: Leading the way. *Yearbook of the National Society for the Study of Education, 104*(1), 140-160. doi:10.1111/j.1744-7984.2005.00009.x

Putman, J. H. (1912). *Egerton Ryerson and education in Upper Canada*. Toronto: William Briggs.

Stake, R. E. (2000). Chapter 17: Qualitative case studies. In N. K. Denzin, & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed.), (pp. 443-466). California: SAGE Publications Inc.

Statistics Canada. (2005). Land and freshwater area, by province and territory. Retrieved on 14 July 2015, from http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/phys01-eng.htm

Statistics Canada. (2008). Literacy. Retrieved on 8 August 2015, from http://www.statcan.gc.ca/pub/81-004-x/def/4068716-eng.htm

Statistics Canada. (2010). Internet use by individuals, by selected frequency of use and age (at least once a day). Retrieved on 8 August 2015, from http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/comm32a-eng.htm

Statistics Canada. (2014). Population by year, by province and territory (number). Retrieved

      on 14 July 2015, from http://www.statcan.gc.ca/tables-tableaux/sum-

      som/l01/cst01/demo02a-eng.htm

The E-Literacy Programme. (2015). Retrieved on 8 August 2015, from

      http://www.eliteracyprogramme.org/

Trilling, B., & Fadel, C. (2009). Chapter 4: Digital literacy skills. In *21st century skills:*

      Learning for life in our times. San Francisco, CA: Jossey-Bass. Retrieved on 18

      September 2014, from

      https://yasamboyuogrenme.wikispaces.com/file/view/21st+CENTURY+SKILLS.pdf

Welcome to the journal of eLiteracy. (2004). *Journal of eLiteracy, 1*, 2-6. Retrieved on 21

      July 2015, from http://www.jelit.org/11/01/JeLit_Editorial.pdf

VITA AUCTORIS

Nathan J. Briffa was born a ram in March and a boar in 1983. Contrary to popular belief, he was not born in a barn, he was raised in Windsor, Ontario, Canada and grew up enjoying the finer things in life: Playing road hockey and playing (now classic) RPGs on his SNES and Genesis. After receiving an undergraduate degree in English Language and Literature from the University of Windsor, Nathan spent five years learning, teaching, and eating (as much as he could) in a countryside prefecture in Japan. After his return to Canada, Nathan redoubled his studies to receive a Bachelor of Education degree and then to produce this thesis. After graduating from the Master of Education programme, he hopes to contribute to society in meaningful ways, all the while enjoying those finer things in life through a philosophy that is summed up by the words, "work hard, and play hard."