EXAMINING THE USE OF DIGITAL TECHNOLOGY BY FOUR LITERACY TEACHER EDUCATORS

by

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Abstract
The purpose of this study is to understand the use of digital technology by four literacy teacher educators through examining their backgrounds, visions, and practices. Three semi-structured interviews were conducted with each participant over a three-year period. The analysis of the interviews suggests four important areas to consider when examining digital technology use. They are: attitudes toward literacy instruction, attitudes toward digital technology, goals for using digital technology, and supports and barriers to using digital technology. The literacy teacher educators highlight innovative uses of digital technology, which are influenced by their multimodal approach to teacher education pedagogy and strong belief that digital technology belongs in the classroom. This research contributes to our understanding of the professional lives of teacher educators and the use of digital technology in teacher education programs.
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Your joy is your sorrow unmasked.
And the selfsame well from which your laughter rises was oftentimes filled with your tears.
And how else can it be?
The deeper that sorrow carves into your being, the more joy you can contain.

When you are joyous, look deep into your heart,
and you shall find it is only that which has given you sorrow that is giving you joy.
When you are sorrowful look again in your heart,
and you shall see that in truth you are weeping for that which has been your delight.
Some of you say, “Joy is greater than sorrow,” and others say, “Nay, sorrow is the greater.”
But I say unto you, they are inseparable.
Together they come, and when one sits alone with you at your board,
remember that the other is asleep upon your bed.

- The Prophet, Khalil Gibran
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Chapter 1: INTRODUCTION

Introduction to the Study

Literacy is the currency of education. As such, how do we measure our wealth and what criteria are we using to demonstrate competency as literate individuals? A seemingly uncomplicated approach would encourage us to define literacy, compile a rigid checklist of literacy indicators, and proceed to categorize everyone based on ability. However, this requires careful consideration of what constitutes literacy and must recognize its continuously evolving nature. A traditional description would define literacy as “the ability to read, write, and perform simple numeric calculations” (CLLRN, 2009, p. 10). Rather than perpetuating literacy as a concrete skillset, I will engage with it as a phenomenon and “the process of using reading, writing, and oral language to extract, construct, integrate, and critique meaning through interaction and involvement with multimodal texts in the context of socially situated practices” (Frankel, Becker, Rowe, & Pearson, 2016, p. 7).

Multimodal texts that build on traditional text involve the use of words in combination with visual, audio, spatial, and gestural modes (Cope & Kalantzis, 2000; Kress, 2010; Mills, 2010). The need for multimodal texts is essential in a time where our methods of communication have evolved to include digital technologies. Luke (2003) points out that, “digital technologies have remediated traditional text genres and forms and generated new modes of textual practice and immediacy” (p. 398). As a result, there is a need for contemporary literacy pedagogy that considers students’ varied encounters with literacy in and out of the classroom while recognizing the rise of digitally-mediated interactions and meaning making via non-traditional modes. The multifaceted nature of modern communication, combined with the proliferation of digital technologies, are therefore forcing us to reexamine literacy practices (Kress, 2010). Instead of focusing on the literacy practices
of teachers in the K-12 classroom, this research will consider teacher educators’ engagement with digital technology in their pre-service courses on literacy teaching.

Cochran-Smith (2003) argues for the need to pay “more attention to what teachers of teachers themselves need to know, and what institutional supports need to be in place in order to meet the complex demands of preparing teachers for the 21st century” (p. 6). One important area of preparation is the effective and meaningful integration of technology. Since the use of technology is not decelerating in our day to day lives and in teachers’ classrooms, looking at the use of digital technology in teacher education is a valuable point of entry. However, “the phrase ‘digital technology in teacher education’ is an amorphous term, in part because the nature and ubiquity of digital devices change rapidly” (Goodnough, Bullock, & Power, 2015, p. 190). This is an important consideration when assessing the wide range of tools at our disposal, which range from presentation software (e.g. PowerPoint, Prezi) to videos, discussion forums, smartphones, and uninterrupted internet access on campus.

**Personal Background**

A few years ago, I eagerly walked up to a podium to receive my Bachelor of Education. My five years in a Concurrent Teacher Education Program (CTEP) had culminated in two university degrees and a license to teach in Ontario. Like my peers, I was excited to make a difference, inspire the leaders of tomorrow, and do my best as a practitioner in one of the most complex, demanding, and rewarding occupations. After one year of occasional teaching, my frustration with certain aspects of the profession grew, and I decided to pursue my graduate studies. On the first day of class, my professor highlighted three ideas that challenged my beliefs on what teachers do, re-conceptualized how I examine issues in education, and provided an avenue of inquiry in teacher education that has formed the basis of my research as a graduate student.
First, all teachers are literacy educators. Regardless of the subject area or grade level, the important task of literacy skill development is the responsibility of all educators and does not fall strictly under a language arts or humanities program. Generally, I had strictly identified myself as a French and history teacher, bound by my subject content specialization. I was unaware that my belief of what constituted literacy - the ability to read and write - was incomplete and overly simplistic. However, I had always understood the importance of using an approach to teaching that would equip my students with the necessary skillset to thrive in a society with ever-changing needs. This made me a strong advocate for the use of critical thinking, the historical inquiry process, technology, and multilingual books in my teaching approach, all aspects of my now expanded and constantly evolving view of literacy. This is all in an effort to equip students with useful tools for jobs that do not yet exist but will in the future.

Second, my professor echoed the statement that teacher educators are a generally under-researched group (Murray & Male, 2005). If teacher education programs want to improve, teacher educators are an important part of the conversation. Upon reflection, I came to realize the large impact and influence that my teacher educators had on my development as a teacher candidate. Whether discussing approaches to teaching, classroom strategies, innovate pedagogy, or trends in education, our conversations played a significant role in shaping my identity as a teacher and researcher. Although none of my teacher education courses focused exclusively on supporting literacy development, it was implicitly embedded into various courses. This research’s focus on literacy teacher educators (LTEs) provides insight into practices related directly to literacy development and instruction. This professional occupation and its complex responsibilities are worth examining more closely as I consider the vital role that teacher educators play when engaging with issues in education.
Third, the use of digital technology in the classroom does not speed up the learning process; instead, it complements it. Therefore, focusing on the uses of digital technology, which have become an integral part of discussions involving twenty-first century learning, is important in establishing digital literacy education as an essential component of a comprehensive literacy program. As a teacher candidate, my only experience with digital literacy outside of PowerPoint presentations was the use of e-portfolios, where reflections on my teaching practice were uploaded on a shared space with my peers. Unfortunately, no time was dedicated to discussing these spaces, thereby turning the experience into a burdensome requirement on a checklist rather than an opportunity for collaboration and inquiry. I share this experience to highlight the need for discussion on digital literacy education and best practices, an area where teacher education programs and teacher educators can make an immense contribution to the professional knowledge of teacher candidates, as well as their experiences with in-class use of digital technology.

**Purpose of the Research**

The purpose of this study is to shed light on the experiences of LTEs who use digital technology. By exploring their personal histories, vision for teaching, beliefs and pedagogies, I hope to provide insight into the work LTEs do and a deeper understanding of the numerous factors that impact their role.

As a graduate student investigating an aspect of teacher education programs, it is imperative that I include the voice of teacher educators, who have been referred to as the “missing link” in education (Hoban, 2005). The interviews offer LTEs a chance to share and reflect on their professional and personal experiences while identifying any turning points, shifts in practice, and perceptions of the role they play in preparing pre-service teachers for the realities of the classroom. A focus on their experiences with digital tools
provides an opportunity to examine how LTEs are engaging with digital technology and how their interactions are reflected in the pedagogy of their literacy courses. By presenting the challenges and successes that they face in their practice, the utility of digital technology and its potential impact on student learning can be better understood, assessed, and refined as new learning tools continue to emerge. In addition, this research invites us to consider what counts as literacy, how different conceptions of literacy affect the learning opportunities LTEs create for students, and how LTEs can provide a digitally-rich classroom experience for pre-service teachers.

Research Questions

My study is guided by the broad research question:

*In what ways do four LTEs use digital technology in their teacher education courses?*

These sub-questions will be investigated:

1. *What are the LTEs’ conceptualizations of literacy in a digital age?*
2. *What supports do they receive when using digital technology in their teacher education courses?*
3. *What challenges do they face when using digital technology in their teacher education courses?*

Organization of Thesis

This thesis is organized in five chapters. In Chapter 1, I introduce my purpose for the study and the guiding research questions. Chapter 2 provides an overview of academic literature relevant to the concept of literacy, literacy pedagogy, the significance of teacher education, and the rise of digital technology. In Chapter 3, I present the qualitative research design used in this study and outline my methods of data collection and data analysis. Chapter 4 begins with a profile of each participant and continues with a report on and analysis of the research findings in the following order: attitudes toward literacy
instruction, attitudes toward digital technology, goals for using digital technology, and supports and barriers to using digital technology. In Chapter 5, I summarize the findings of this study, discuss the implications of this research within the context of literacy teacher education, and make recommendations for future research.

Definition of Terms
In this section, I define terms used throughout this thesis. Since the definitions vary depending on geographical location and local context, they are defined per their use in Canada & the United States.

Pre-service Teacher: A pre-service teacher is an individual pursuing the qualification to teach by enrolling in a pre-service teacher education program. Candidates enroll having already completed a Bachelor’s degree (consecutive model) or while completing their undergraduate degree (concurrent model).

Pre-service Teacher Education Program: Pre-service teacher education programs provide individuals with the qualification to teach one or more academic subjects at their desired grade level (e.g. elementary, secondary). Upon successful completion of university-based coursework taught by teacher educators as well as practice teaching placements, pre-service teachers become licensed to teach.

Practice Teaching: Practice teaching is a component of the pre-service teacher education program that provides pre-service teachers with the opportunity to teach in a classroom setting under the guidance of a qualified teacher. Candidates assume the roles and responsibilities of a full-time teacher during their placements.

Literacy Teacher Educator: LTEs are individuals working in university-based pre-service teacher education programs that deliver courses on literacy to pre-service teachers. The courses taught vary in emphasis, ranging from new literacies, language development, literacy instruction, and multilingual education.
Chapter 2: A REVIEW OF THE LITERATURE

This chapter is organized into three main sections. The first outlines how literacy has been understood and how it has evolved in response to new literacy practices that deserve our attention. The second engages with the complex responsibilities of teacher education programs and the work of teacher educators. The third discusses the rise of digital technology in education and the efforts to integrate it in teacher education programs.

**Conceptualizing Traditional Literacy**

Definitions provide a common understanding of a concept or term. They are intended to provide clarity, reduce confusion, and simplify complex ideas by providing a point of entry. When literacy is the focus of a conversation, its conventional definition as the “cognitive skills of reading and writing” comes to mind (UNESCO, 2006, p. 149). However, such a narrow conceptualization is problematic since “literacy is no longer exclusively understood as an individual transformation, but as a contextual and societal one” (UNESCO, 2006, p. 159). Discussions framing literacy must take into account how the acquisition of literacy skills can “contribute to socio-economic development, [and] to developing the capacity for social awareness and critical reflection as a basis for personal and social change” (UNESCO, 2006, p. 147).

One of the issues with definitions of literacy is how they “shape our perceptions of individuals who fall on either side of the standard (what a literate or non-literate is like) and thus in a deep way affect both the substance and style of educational programs” (Scribner, 1984, p. 6). How is being literate determined and measured in the twenty-first century? What understandings of literacy are promoted in schools? Have approaches to literacy teaching and learning been modified to account for changes in how students communicate?
An expanded understanding of literacy that encompasses the “comprehension and production of printed texts” as well as “a wide variety of communication modalities” is necessary at a time when “[t]he technological and social/cultural demands of the 21st century are reshaping communication expectations” (Westby, 2010, p. 64). Simply put, redesigned literacy pedagogy must go beyond traditional text and print if it wants to meet students’ diverse needs (Gee & Hayes, 2011). Unfortunately, Lankshear & Knobel (2011) contend that “schools demonstrably do not teach effectively, or even seriously promote, many of the literacy skills and understandings students need in their lives now and in the future” (p. 73). What is taught in schools is largely influenced by the attitudes and practices of individual teachers, school board initiatives, and numerous policies on what demonstrating educational attainment consists of. Furthermore, ensuring that educators across the globe engage with a modified and renewed literacy pedagogy is an enormous task. This challenge is not aided by the “conventional singular educational conception of literacy with print” that largely ignores “the plurality of literacies and the politics of literacy within formal education” (Lankshear & Knobel, 2008, p. 9).

Therefore, there is a need for literacy pedagogy that recognizes students’ out-of-classroom literacies, which have been shaped by the rapid spread and continued use of communication technologies (Kress, 2010; New London Group, 1996). The rise of digitally-mediated interactions among children and their contribution to identity formation, information sharing, and relationship building must be considered when developing literacy pedagogy (Alvermann, 2010; Cope & Kalantzis, 2000; Kress, 2010; Lankshear & Knobel, 2011). These social interactions take place on platforms that can provide instant photo sharing (e.g., Snapchat), online forums for any interest (e.g., Reddit), live video streaming (e.g., YouTube), and quick-time multimodal updates (e.g., Twitter).
Approaching Multimodal Literacy

A multimodal approach to literacy pedagogy is needed in response to the different ways our interconnected society engages in meaning-making and forms social relationships using various technologies (Cope & Kalantzis, 2009; Gee, 2000; New London Group, 1996; Lankshear & Knobel, 2011). “When technologies of meaning are changing so rapidly, there cannot be one set of standards or skills that constitute the ends of literacy learning” (New London Group, 1996, p. 64). In addition, it has become incredibly unrealistic to claim that there is an exact moment in time where every individual goes from being illiterate to literate. Literacy learning remains a process that undergoes constant refinement throughout one’s life in response to specific contexts and experiences; it cannot be conquered.

A multiliteracies framework was put forward by the New London Group (NLG) to address changes in communication technologies and their impact on society, as well as to make recommendations for literacy pedagogy that are aligned with new contexts for learning literacy. The framework recognizes the need to move away from literacy as traditional print and consider interactions with multimodal texts. As they explain,

We attempt to broaden this understanding of literacy and literacy teaching and learning to include negotiating a multiplicity of discourses. We seek to highlight two principle aspects of this multiplicity. First, we want to extend the idea and scope of literacy pedagogy to account for the context of our culturally and linguistically diverse and increasingly globalized societies, for the multifarious cultures that interrelate and the plurality of texts that circulate. Second, we argue that literacy pedagogy now must account for the burgeoning variety of text forms associated with information and multimedia technologies (New London Group, 1996, p. 60).

The framework does not call for the abandonment of traditional reading and comprehension tasks; instead, it is meant to supplement existing practices and develop teachers’ literacy pedagogy in the classroom (Kalantzis & Cope, 2000). The learning experience that takes place using multiliteracies is essentially different than the one made
possible using a monomodal approach. According to Cope and Kalantzis (2000), the learning is “one in which language and other modes of meaning are dynamic representational resources, constantly being remade by their users as they work to achieve their various cultural purposes” (p. 5). The emphasis shifts from the transmission of information and culture to a process of meaning-making that values the lived experiences and individual contexts of students. In this regard, the multiliteracies approach succeeds in “building on and recruiting what the learner already knows and has accomplished” (NLG, 1996, p. 86).

A second discourse on multiliteracy is known as New Literacy Studies (NLS), which views literacy as “a repertoire of changing practices for communicating purposefully in multiple social and cultural contexts” (Mills, 2010, p. 247). The emphasis shifts from literacy as the cognitive ability to read and write toward an understanding of literacy practices in their sociocultural context (Street, 2005). It extends beyond introducing the use of digital tools in the classroom and encourages the consideration of specific practices of literacies that occur within contexts known as discourses, which are frequently changing and adapting to the social and cultural transformations around them (Gee, 2000). Since practices are constantly redefined and understood in different ways, NLS stresses that “any piece of language, any tool, technology, or social practice can take on quite different meanings (and values) in different contexts” (Gee, 2000, p. 188).

Both the NLS and multiliteracies approach have attempted to redefine how literacy is discussed, but they do so in markedly different ways. Rowsell, Kosnik, & Beck (2008) concisely present some of the main differences:

According to Lankshear and Knobel (2003), NLS represents ‘a new way of looking at literacy ... sometimes referred to as a socio-cultural approach ... [and] to date many people who ‘belong to’ and contribute to the NLS have not been very interested in ... new literacies’ (p. 23). Equally, NLS scholars have not always been very interested in pedagogy. Thus, multiliteracies contrasts with NLS in two respects: it has considerable (though not
exclusive) interest in new literacies, and it strives continually to develop theory that is ‘of direct use in educational practice’ (New London Group, 1996, p. 89). Nevertheless, the NLS emphasis on the sociocultural nature of literacy has had a major impact on both the multiliteracies and new literacies movements (Hull & Schultz, 2002). (p. 111)

The differences make it clear that “literacy pedagogy and research has been a much-contested field” (Mills, 2009, p. 110). Regardless of the tension, “literacy scholars are united in their view that global trends call for multiliteracies approaches that incorporate a broadened range of hybrid literacies and new pedagogies” (Mills, 2009, p. 111).

**Defining Digital Literacy**

When discussing the changing landscape of communication in contemporary society, the spread of digital technology and media have altered how we share and receive information. In many ways, the use of digital media is “breaking down boundaries that have traditionally defined our literacy practices” (Jones & Hafner, 2012, p. 13). Luke (2003) suggests that “the texts of new technologies have mutated into complex, hybrid semiotic systems that have made new demands on reading, writing, viewing, social exchange and communication” (p. 401). The process of acquiring knowledge and language proficiency has changed significantly because of digital media; this process necessitates a better understanding of how the process has changed and how existing practices need to be revised for new contexts. “Digital media deliver knowledge and language, just like writing and print do. But they do so faster, more widely, more easily, and in a way that allows rapid modification and wider participation” (Gee & Hayes, 2011, p. 88). Therefore, the constraints and opportunities made possible by digital media in the classroom deserve more attention.

Despite the role that digital technologies and media plays in our everyday lives, “a unified definition of digital literacy, or literacies, is yet to emerge” (Meyers, Erickson, & Small, 2013, p. 360). Jones and Hafner (2012) refer to digital literacies as “the practices
of communicating, relating, thinking and ‘being’ associated with digital media”, but a precise definition remains elusive (p. 13). Digital literacy is often considered as a part of the multiliteracies movement to diversify literacy pedagogy but can be examined on its own due to its multi-faceted nature.

Although it lacks a concrete definition, Meyers, Erickson, and Small (2013) point out that digital literacy can be discussed as (1) acquiring ‘information age’ skills; (2) cultivating ‘habits of mind’; or (3) engaging in digital cultures and practice. This conceptualization of digital literacy highlights the measurable skills that students can attain through explicit instruction, as well as the significance of developing the capacity to engage in a digital culture, where participation and context are more valuable than a checklist of skills. Engagement in digital cultures aligns with the multiliteracies approach.

A different way to engage with the many layers of digital literacy that also considers skill acquisition was suggested by Lankshear and Knobel (2008).

One way of distinguishing the burgeoning array of concepts of digital literacy is, indeed, to delineate those that emphasize mastery of ideas and insist on careful evaluation of information and intelligent analysis and synthesis, from those that provide lists of specific skills and techniques that are seen as necessary for qualifying as digitally literate. (p. 2)

It is evident that what qualifies as being digitally literate is shaped by the user’s interactions with digital technologies. The practical how-to knowledge of using a digital tool, combined with an understanding of the opportunities for learning and meaning-making resulting from this technical proficiency, allow for a more thorough dissection of digital literacies. By examining how teacher educators’ literacy practices are influenced by the technologies around them, a clearer picture of what it means to be digitally literate can be painted. If teacher education programs want to effectively prepare teachers for the realities of twenty-first century teaching and learning, then digital literacies belong at the forefront of the conversation.
The State of Teacher Education

Teacher education prepares pre-service teachers for the classroom. It involves teaching them about teaching and learning to teach, a challenge not to be underestimated.

“Learning to teach can be conceptualized around four broad themes—learning to think like a teacher, learning to know like a teacher, learning to feel like a teacher and learning to act like a teacher” (Feiman-Nemser, 2008, p. 698). This multi-layered process requires a well-developed approach that can best setup pre-service teachers for success in their professional lives. However, it would be unrealistic to assume that there is one best approach to educating teachers. Hoban (2005) notes that “[t]eacher preparation programs vary according to the goals, course content, and beliefs of the teacher educators, students, and teachers, as well as the social-cultural context of schools involved” (p. 1).

Despite the anticipated differences from one program to the next, teacher education as a discipline can benefit greatly from a process the imparts the knowledge and skills required to be a teacher. Loughran (2006) coined the phrase “a pedagogy of teacher education” that involves a knowledge of teaching about teaching and a knowledge of learning about teaching. The pedagogy requires an examination of “how the two influence one another in the pedagogic episodes that teacher educators create to offer students of teaching experiences that might inform their developing views of practice” (Loughran, 2008, p. 1180). It provides guidance about what teacher education program should provide for future teachers under the tutelage of teacher educators.

The Case of Teacher Educators

According to Ducharme and Ducharme (1996), teacher education programs and faculty are viewed as “both the cause of all school problems and the source of many of its solutions” (p. 705). Examining the work that teacher educators do thus becomes a necessity for school improvement, as they are considered “the linchpins in educational
reforms of all kinds” (Cochran-Smith, 2003, p. 5). Despite recognizing the immense contributions that teacher educators can make, there is a lack of research on them.

Martinez (2008) notes:

Little systematic research has been undertaken to inform us about fundamental characteristics of the professional lives of this occupational group--their qualifications, their recruitment, their career pathways into and through the academy, their teaching and research practices, the problems they encounter, or their professional needs and practices. (p. 36)

This lack of research makes improving teacher education programs a more difficult undertaking since there is little understanding of teacher educators, a main stakeholder. “In many countries, there is still relatively little awareness about teacher educators’ key roles in improving educational attainment, or the competences they need to fulfill their roles effectively” (European Commission, 2013, p. 11). In addition, teacher educators are not a homogenous group though they tend to be discussed as one (Ducharme & Ducharme, 1996). They possess different bodies of knowledge across subject content areas and disciplines that ought to be considered (Boyd and Harris, 2010).

The skills that teacher educators possess will play a crucial role in the courses they deliver and the knowledge they share with pre-service teachers, which will impact their in-service teaching in the future. Loughran (2006) states that teacher educators must “theorize practice in such a way as to know and be able to articulate the what, how, and why of teaching and to do so through the very experiences of teaching and learning about teaching” (p. 14). By learning about the beliefs and practices of teacher educators, teacher education programs can pursue a higher quality of teacher preparation. “It is reasonable to assume that quality teacher preparation depends on quality teacher educators” (Goodwin & Kosnik, 2013, p. 334). Furthermore, a quality teacher preparation program leads to more effective and knowledgeable teachers who are more committed to the teaching profession (Futrell, 2008; Feiman-Nemser, 2008).
The Role of Multiple Literacies

The need for a multiple literacies approach in K-12 education discussed earlier in the literature review requires changes to be made in teacher education programs. Recently, literacy scholars have advocated the use of multiple literacies in literacy teacher education (Ajayi, 2011; Cervetti, Damico, & Parson, 2006; Luke, 2000; Rowsell et al., 2008). This requires both teachers and LTEs reevaluating their conceptions of literacy and what literacy programming in schools entails (Gee & Hayes, 2011). In-service teachers are urged to adopt a new approach to literacy teaching that varies in many ways from their time as students and as pre-service teachers (Darling-Hammond, 2006; Kirkwood, 2009). Therein lies one of the many challenges of teacher education; “it must prepare teachers for schools as they are at the same time as it must prepare them for schools as they might become” (Cervatti et al., 2006, p. 384).

The multiple literacies approach is in a constant state of refinement and is not guaranteed to be an essential element of every schools’ literacy programming, thus making it difficult for teacher educators to decide what their pre-service teachers need to know. The problem is compounded by the fact that “little has been written about the program that might prepare future teachers for multiple literacies pedagogy” (Cervetti et al., 2006, p. 379). Despite an uncertainty surrounding how best to prepare pre-service teachers, teacher educators are not powerless in terms of what they can do in their courses. For example, teacher educators can ensure that their pre-service teachers view “literacy as inherently situated in personal, historical, cultural, and social contexts, and learn to nurture in [them] a similarly situated stance toward literacy” (Cervetti et al., 2006, p. 380).

One of the key questions is, according to Futrell (2008), “whether we are preparing educators, especially teachers, for the knowledge-based, global society in
which we now live, or whether we are still preparing them for the industrial era that is long past” (p. 536). Teacher education pedagogy cannot be future-proofed at a time when technological innovations are occurring frequently (Davies & Merchant, 2014). However, that does not preclude LTEs from emphasizing the importance of multiple literacies in the classroom as well as finding meaningful ways to engage with students’ varied literacy practices. The use of multiple literacies ranges from using technology in the form of forums or blogs to the use of texts that shy away from traditional print. In all, the approach that LTEs use in delivering their courses must equip pre-service teachers with the right attitude and disposition to succeed in the twenty-first century classroom.

**Introducing Digital Technology**

The use of digital technology in literacy education is a major component of the multiple literacies approach promoted in teacher education programs. A digitally-rich approach to literacy instruction is not intended to replace traditional practices; instead, it is meant to help create a more holistic pedagogy for literacy teaching (Alvermann, 2008; Cope & Kalantzis, 2000). The proliferation of digital technology in education has led to what is known as “teaching 2.0”. According to Bullock (2011), it is “a reminder that digital teaching is not just traditional teaching ‘done better;’ teaching 2.0 is a radically different approach to teaching and learning that requires educators to understand, and make use of, the affordances of Web 2.0 tools” (p. 103).

The use of digital technology in teaching will not automatically enhance learning. It instead has the potential to reframe how knowledge is created, how information is shared, and how classrooms are structured with the help of Web 2.0 tools. Albion (2008) highlights that “Web 2.0 offers a variety of powerful and accessible tools that support participation and make it possible for users to acquire, process and distribute information in a variety of digital formats” (p. 186). Furthermore, Merchant (2009) argues that Web
2.0 technologies “invite new ways of thinking about the production and circulation of the artifacts of learning, reconfiguring relationships between learners and experts, as well as teachers and their teaching resources” (p. 17). Access to Web 2.0 spaces thus transforms both the teaching and learning process, and requires both teachers and students to evaluate the new ways they interact with the world around them.

Bullock (2011) summarizes the considerable influence that Web 2.0 has had in education. He explains,

The social affordances of Web 2.0 technologies have altered our expectations for what is possible online and, by extension, what is possible in digitally enhanced classroom environments. People have become used to interacting in collaborative and collective ways in their personal lives, to the extent that their dissatisfaction with teacher-directed, transmission-oriented learning situations is bound to increase at all levels of the education system…I believe that the concepts of networked publics and collective intelligence challenge educators not to simply develop strategies to replicate a traditional face-to-face, non-digitally enhanced environment, but to go further and fundamentally alter their pedagogical approach in conjunction with, and as a result of, the possibilities associated with digital technologies. (p. 96)

The goal of integrating digital technology becomes a matter of shaping new attitudes toward the tools that contribute to new ways of learning rather than mimicking already existing learning environments that can benefit from pedagogical renewal. A shift in pedagogy is possible not solely because of the access to technological resources, but also because of the educators’ creativity and the commitment of policy makers (Merchant, 2009).

In the context of teacher education, “the best approach to helping [pre-service] teachers learn about Web 2.0 may well be to have them learn with Web 2.0” (Albion, 2008, p. 193). The experiences that teacher educators provide for their students set an example for the type of activities that pre-service teachers may use in their own classrooms. Therefore, teacher educators ought to use digital technology in delivering their courses and help their students develop the mindset and practical knowledge for
using it in their own classrooms (Bullock, 2011; Kirkwood, 2009; Walsh & Durrant, 2013). Although teacher educators will integrate digital technology to varying degrees, Selwyn (2011a) suggests that “questions which explore digital technologies in schools from the lived experiences of those using (and those not using) them should be at the forefront of any educational technologist’s mind” (p. 40).

**Troubleshooting Digital Technology**

The integration of digital technology in teacher education is not as effortless and straightforward as it may seem. According to Boling (2005), “research has revealed that teacher educators do not always have the knowledge, skills, or dispositions necessary for meaningfully integrating technology into their classes” (p. 3). Several barriers discourage them and other faculty in higher education institutions from using technology. Butler and Sellbom (2002) identify these factors as deterrents to using technology: reliability; time to learn the technology; knowledge of how to use the technology; and whether the technology is crucial for learning. These factors, in more ways than one, are related to users’ prior experiences with technology and preconceptions about their significance.

The identified barriers likely emanate from the fact that many teacher educators are “digital immigrants” and not “digital natives”, meaning they did not grow up surrounded by computers and the internet (Prensky, 2001). Being a digital native, however, does not automatically equate to proficiency with digital tools.

> It is about younger people’s comfort with digital technology, their belief in its ease, its usefulness, and its being generally benign, and about their seeing technology as a fun ‘partner’ that they can master, without much effort, if they are shown or choose to. (Prensky, 2011, p. 17)

Although a digital native may have familiarity with how to use digital technology, the practical knowledge alone is not sufficient from a pedagogical perspective. Otero et al. (2005) suggest that “knowing how to use the technology involves the
technical skills of operating the tools as well as understanding the pedagogical purpose of its use” (p. 10).

In a study on the use of digital technologies by digital native pre-service teachers, Lei (2009) found that pre-service teachers were proficient in using social media platforms but lacked knowledge about technologies that can be useful in the classroom. The author concludes that “being able to use technology does not necessarily mean being able to use technology critically, wisely, or meaningfully” (p. 88). Similarly, Kosnik, Menna, and Bullock (2016) indicate that they did not expect their pre-service teachers to struggle with using digital technology in their teaching; however, candidates’ self-reports revealed that it was a challenge during practice teaching. The integration of digital technology for the digital native and immigrant can prove challenging for different reasons.

Educators who are digital immigrants must embrace the idea that they need to teach in ways that they were not taught (Prensky, 2001). Their lack of extended exposure to and interactions with digital technology does not inhibit them from using it in meaningful ways but it “affects their capacity to see how digital technology can be used even among students in their classroom who appear at ease with technology, and to understand the importance of teaching digital technology to so-called digital natives” (Kosnik et al., 2016). Instead of positing the digital native against the digital immigrant, Prensky (2011) advocates digital wisdom, which involves using technology in creative ways that can enhance the teaching and learning process. Digitally-wise teacher educators can instill the right attitude toward digital technology in their students.

In addition to faculty members’ multi-layered dispositions toward the digital world, Butler and Sellbom (2002) also cite a perceived lack of institutional support as a barrier to using technology. Institutional support ranges from access to the technology
and troubleshooting experts to viability of a technologically-enhanced pedagogical approach. Kirkwood (2009) highlights that “[i]n many universities and colleges e-learning policies and strategies have been introduced in a top-down manner, with institutional decisions being made about the systems and infrastructure adopted” (p. 114). If an instructor’s course design does not align with the recommended digital tools, then the use of technology might be more harmful than encouraging in the teaching process. Furthermore, universities are part of a “scriptural economy that prioritizes the printed word” (Mitchell, 2012, p. 1). As a result, faculty at research-intensive universities have less incentive to get creative and participate in the proliferation of digital literacy if the information that is of ‘value’ remains concatenated to traditional text-heavy approaches.

**Integrating Digital Technology**

In order to integrate digital technology, an understanding of its uses and the skills needed to use it is necessary. In a meta-analysis of literature that discusses technology-enhanced learning (TEL), Kirkwood and Price (2014) point out that a far greater number of articles emphasize how TEL can replicate and supplement existing approaches rather than how it can transform teaching and learning practices. This is unsurprising since the assumption that educational practice can be instantly transformed through digital technology is an exaggeration of a process that requires time before it can be transformative (Kosnik, White, & Beck, 2016). Selwyn (2011b) echoes a similar sentiment when he argues that “[d]espite repeated predictions of inevitable change and impending transformation, digital technologies are used inconsistently in educational settings, usually with little large-scale conclusive ‘effect’” (p. 714).

To address the inconsistencies, approaches that classify the uses of digital technology and the goals they achieve can help education professionals reflect on their attitudes and measure the impact of their efforts to integrate digital technology. To better
classify how digital technology is used in pre-service education, Ottenbreit-Leftwich, Glazewski and Newby (2010) provide six main approaches used for preparing pre-service teachers for digital integration. They are: (1) information delivery; (2) hands-on skill building activities; (3) practice in the field; (4) observations and modeling; (5) authentic experiences; and (6) reflections. These approaches range from pre-service candidates developing technology skills and using them in practice teaching to observing exemplary uses of technology and reflecting on their beliefs regarding technology integration. The authors further suggest that “[t]eacher education faculty should consider the broader context and technology content goals before selecting approaches and designing activities” (p. 29). Since new technologies are always emerging, the approach chosen, as well as the intended outcomes, are subject to constant refinement.

Before using different approaches to integrating technology, teacher educators must possess a degree of competence with the digital tools they hope to use. Desjardins, Lacasse, and Bélair (2001) list four competencies that teachers require. They are:

1. technical - the ability to use the technology;
2. informational - the ability to use the technology to extract information;
3. social - the ability to use the technology to interact with people; and
4. epistemological - the ability to use the technology to produce new knowledge.

Bullock (2016) points out that although these competencies were designed with practicing teachers, they serve as “useful heuristics for considering the way forward in the use of digital technologies in teacher education” (p. 8). Digital natives likely do not struggle with the technical competency, since it serves as a prerequisite for the remaining ones. The challenge lies in examining whether the social and epistemological competencies are being developed through teacher education courses. If so, how meaningful and impactful are the type of activities that teacher educators are designing
for their students? If not, what obstacles are preventing teacher educators from pursuing these competencies in the courses they teach? By engaging with frameworks that discuss the uses of digital technology in education, there is a reference point when examining the attitudes and practices of professionals in the field.

**Conclusion**

This chapter has presented an overview of the relevant literature and research that informs my dissertation research. The review began with a discussion on traditional approaches to literacy, introduced the emergence of multiliteracies, and highlighted the development of digital literacy. An examination of what teacher education programs do, the role of teacher educators, and the need for a multiple literacies approach in teacher education pedagogy followed. Finally, the rise of digital technology and issues surrounding its integration in teacher education were expounded. In the next chapter, the research methodology that was used to employ this study will be presented.
Chapter 3: RESEARCH METHODOLOGY

Research Design

A qualitative research methodology was chosen for this research, as defined by Merriam and Tisdell (2015) and Punch (2014). The use of qualitative inquiry is justified based on the topic of study and the existing knowledge on it, which generally favors an approach focused on theory generation rather than theory verification (Punch, 2014). The unfolding nature of the research moves away from the pursuit of pre-structured data, which allows the participants to share new ideas and unforeseen insight as they discuss their opinions on predetermined subjects. As a qualitative researcher, my interest lies in “understanding how people interpret their experiences, how they construct their worlds, and what meaning they attribute to their experiences” (Merriam & Tisdell, 2015, p. 6). Thus, a qualitative design helped me gain a better understanding of the LTEs’ use of digital technology and how the interactions shaped their practice and visions for teaching.

Merriam and Tisdell (2015) identify four features to describe qualitative research: “the focus is on process, understanding, and meaning; the researcher is the primary instrument of data collection and analysis; the process is inductive; and the product is richly descriptive” (p. 30). In my research, the focus is on the experiences of LTEs and their approaches to literacy teaching. Their perspectives inform the research area of interest. Since I am the qualitative researcher conducting the study, I accepted the undeniable presence of bias, stemming from my own experiences as an occasional teacher, a digital native, and my coursework on teacher education and literacy. Rather than avoiding bias altogether, which is an insurmountable task, I recognized the influence it can have on the process of data collection and analysis and made a conscious effort to lessen its effect on my work.
Additionally, the research process is highly inductive and moves away from testing a predetermined hypothesis. Interviews, observations and information from the participants helped me classify data into themes and concepts as well as make note of new avenues for inquiry and potential areas of research. Lastly, the heavier reliance qualitative research has on words rather than numbers means that the data collected will be much more descriptive. For example, the inclusion of quotes from the participant interviews provided a greater context and led to a deeper understanding of their experiences. The use of rich data also provides substantial analysis. Rich data is “detailed, focused, and full”, and they “reveal participants' views, feelings, intentions, and actions as well as the contexts and structures of their lives” (Charmaz, 2014, p. 23). In choosing a qualitative approach, I was aware of its exploratory nature and potential to yield the unexpected. Patton (2015) sums up the journey of conducting qualitative research veraciously. The author explains:

Start to finish is rarely, if ever, a simple, linear path. Be prepared for some major forks in the road, detours, emergent opportunities, disappointments, and thrills. For qualitative inquiry takes you into the world to experience and document the world, and the world, being multidimensional, multilayered, complex, dynamic, and enveloping, will take you to places both planned and unplanned. (p. 37)

Participant Selection

Participants in the Larger Study

The four participants in this research were chosen from a group of twenty-eight LTEs who had already participated in a large-scale SSHRC (Social Sciences and Humanities Research Council) study entitled Literacy Teacher Educators: Their Backgrounds, Visions, and Practices. The principal investigator of this study was Dr. Clare Kosnik from the Ontario Institute of Studies in Education, University of Toronto.
Invitations to participate in the larger study were first sent to 15 LTEs. This led to ‘snowball sampling’, whereby one LTE would recommend a colleague who might be a good fit for the study. According to Punch (2014), snowball sampling involves identifying “cases of interest from people who know people who know what cases are information rich” (p. 162). The sample list grew to twenty-eight participants from four countries: Canada, the USA, the UK and Australia. To ensure consistency, all participants had a doctorate degree and were involved in teaching literacy/English methods courses. They worked at either a research-intensive or teaching-intensive university and had experience as classroom teachers and as LTEs. Also, an attempt was made to capture different classroom experiences ranging from elementary to secondary, as well as a ratio of male to female participants that reflects the teaching profession. Below is an overview of the twenty-eight participants.

Table 1: Background of Twenty-Eight Participants.

<table>
<thead>
<tr>
<th>Experience as classroom teacher</th>
<th>0 years = 1 1-5 years = 3 6-10 years = 12 11-20 years = 6 21+ years = 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience as a teacher educator</td>
<td>1-5 years = 7 6-10 years = 10 11-15 years = 2 16-20 years = 5 21+ years = 4</td>
</tr>
<tr>
<td>Countries</td>
<td>Canada - 8 U.S.A. - 10 U.K. - 5 Australia - 5</td>
</tr>
</tbody>
</table>
Participants in My Study

In my study, I decided to use purposive sampling to determine which of the twenty-eight LTEs I wanted to examine more closely. The initial use of snowball sampling discussed above led to numerous information-rich cases. “Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the inquiry, thus the term *purposeful sampling*” (Patton, 2015, p. 53). “Purposeful sampling is based on the assumption that the investigator wants to discover, understand, and gain insight and therefore must select a sample from which the most can be learned” (Merriam & Tisdell, 2015, p. 96). After examining the data, I identified a group of four LTEs who used digital technology extensively in their pedagogical approach to support pre-service teachers enrolled in their courses. That was my main criteria when selecting the subset. The four participants are also all from the U.S.A., which provides some consistency in terms of the location of practice despite inevitable differences within individual contexts. Below is an overview of their background.

Table 2: Background of Four Participants.

<table>
<thead>
<tr>
<th>Experience as classroom teacher</th>
<th>0 years = 0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-5 years = 0</td>
</tr>
<tr>
<td></td>
<td>6-10 years = 3</td>
</tr>
<tr>
<td></td>
<td>11-20 years = 1</td>
</tr>
<tr>
<td></td>
<td>21+ years = 0</td>
</tr>
</tbody>
</table>
| Experience as a teacher educator | 1-5 years = 1  
|                                  | 6-10 years = 1  
|                                  | 11-15 years = 0  
|                                  | 16-20 years = 1  
|                                  | 21+ years = 1  
| Countries                        | Canada - 0  
|                                  | U.S.A. - 4  
|                                  | U.K. - 0  
|                                  | Australia - 0  
| Gender                           | Female = 4  
|                                  | Male = 0  

Data Collection Sources

All participants were interviewed three times over the period April 2012 to July 2014. Each semi-structured interview was approximately 60-90 minutes in length. Interviews were done either face-to-face or via Skype and were audio-recorded and transcribed. A semi-structured interview “allows the researcher to respond to the situation at hand, to the emerging worldview of the respondent, and to new ideas on the topic” (Merriam & Tisdell, 2015, p. 111). I was not bound by a rigid interview structure that would have inhibited me from asking follow-up questions in response to interesting participant responses. Therefore, the use of open-ended and non-judgmental questions encouraged “unanticipated statements and stories to emerge” (Charmaz, 2014, p. 65).

How the interview questions are constructed and how the interviews are conducted are two factors that determine “how well you achieve a balance between making the interview open-ended and focusing on significant statements” (Charmaz, 2014, p. 65). Participants were asked the same questions to extract specific information (e.g. focus of PhD research, topics covered in courses), but the flexibility of semi-
structured interviews allowed me to use probing questions and invite additional comments at any time. The interviews provided information about LTEs’ experiences, feelings, and attitudes that could not have been observed (Merriam & Tisdell, 2015).

As Patton (2015) explains:

> We cannot observe feelings, thoughts, and intentions. We cannot observe behaviors that took place at some previous point in time. We cannot observe situations that preclude the presence of an observer…[and] how people have organized the world and the meanings they attach to what goes on in the world. We have to ask people questions about those things. (p. 426)

Intensive interviewing in this study is justified as it “facilitates conducting an open-ended, in-depth exploration of an area in which the interviewee has substantial experience” (Charmaz, 2014, p. 85). It is beneficial when conducting interpretive inquiry and allows the interviewer to “shift the conversation and follow hunches” (Charmaz, 2014, p. 69). As a result, a “special kind of information” can be obtained (Merriam & Tisdell, 2015, p. 107).

The First Interview

The first interview’s focus was on exploring the personal histories of the LTEs. It addressed their background experiences, perceptions of teacher educators and their research activities. The six parts of the interview were: participants’ background; influences on their current practices; qualities (in their view) of an effective teacher educator; academic knowledge and community; identity; and experiences with research.

The first two parts centered on the LTEs’ educational and work backgrounds and the influence their work experiences had on their role as an LTE. Questions included: “What jobs/positions did you have prior to joining the university (e.g., teacher)?” and “Thinking about your previous educational experiences and work experiences, which do you see as being the most useful in your current work as a literacy teacher educator?”
The next three parts encouraged participants to reflect on their perceptions of what teacher educators do, their engagement within their academic community, and their identity as teacher educators. Some of the questions were: “Can you provide a job description for a literacy teacher educator?”, “How comfortable are you being labelled a teacher educator?”, and “Do you feel that as a teacher educator you are perceived differently than a scientist or a professor of English literature?” Finally, questions centered around research were asked, ranging from the participants’ PhD. focus to recent research activities. Questions such as “Do you think it is important for teacher educators to be doing research? If yes, why? If no, does this present any problems?” and “If you have written any books, who are they written for (teachers, researchers, teacher educators)?” were answered.

**The Second Interview**

The second interview considered pedagogy and was made up of four parts: framework and goals for their literacy course; pedagogies used and the rationale behind them; assignments and readings; and shifting views and practices of literacy. The main emphasis was on one literacy course that the LTE had chosen and taught; the course served as a reference point when answering most of the questions and the participants were able to reflect on different aspects of delivering the course.

The logistics of the course and its aims were first discussed (e.g. topics covered) followed by an examination of the strategies used to deliver it (e.g. teaching style). Questions included: “What are the particular goals for this course? How did you determine these goals? Why are these goals important for beginning teachers?” and “What do you find most challenging about teaching literacy courses?”

The third and fourth section invited participants to reflect on their assessment strategies for their course and how their work as teacher educators has evolved as a result
of their experiences. Questions ranged from “Is there anything that you would like to change about the course? Timing. Length. Topic. Sequence in the program.” to “How has your practice as a literacy teacher educator changed? Why has it changed?”

**The Third Interview**

The focus of the final interview was on teacher education programs and digital technology. After an update regarding highlights or challenges from the participants’ recent work, they were asked questions about teacher education such as, “What would you like to see in your literacy teacher education program that is currently not part of it?” and “What topics should we be addressing as Literacy/English Teacher Educators?”

The place of digital technology in teacher education was then discussed through questions like, “What place should digital technology have in a teacher education program?” and “What kind of DT do you use in your course?” Some proceeding questions utilized a Likert scale to assess LTEs’ attitudes toward digital technology. For example, “On a scale of 1 to 5 with 5 being the highest, how comfortable are you using DT in your teaching?” and “On a scale of 1 to 5 with 5 being the highest, how much do you actually use DT in your teaching?” After asking the LTEs’ to reflect on their perceptions of its benefit and actual use in their classroom and personal lives, the final section focused on their future plans, asked what advice they would give new LTEs, and where they would like to be in 5 to 10 years in their personal and professional lives.

**Data Analysis**

A grounded theory approach is a research strategy that is used to generate theory from empirical data (Glaser & Strauss, 1967; Punch, 2014). It is an approach that “has become firmly associated over time with qualitative research” (Denscombe, 2010, p. 109). The use of grounded theory is justified due to a lack of research on the role of digital technology in teacher education and LTEs as a group of education professionals. When
theorizing about a topic is difficult due to the absence of a “satisfactory theory”, a better understanding is needed that requires the researcher to “approach the data as open-mindedly as possible, guided by research questions” (Punch, 2014, p. 135).

Grounded theory is an inductive rather than a deductive procedure that aims to generate new theories rather than verify already existing ones (Punch, 2014; Charmaz, 2014). The data generation of theory involves carrying out the collection, coding, and analysis of data simultaneously, thus moving away from the predominantly procedural approach to research and supporting the concept of theory as a process (Glaser & Strauss, 1967). The exploratory nature of the work provides the flexibility and opportunity to pursue further inquiry in areas that arise throughout the research process which could not have been determined at the beginning of the study. As grounded theorists, “[w]e do not force preconceived ideas and theories directly upon our data. Rather, we follow leads that we define in the data, or design another way of collecting data to pursue our initial interests” (Charmaz 2014, p. 32).

One aspect of grounded theory is theoretical sampling, which informed my use of purposive sampling when determining the subset of participants I used in this study. Theoretical sampling is the process through which “the analyst jointly collects, codes, and analyzes...data and decides what data to collect next and where to find them, in order to develop...theory as it emerges” (Glaser & Strauss, 1967, p. 45). Furthermore, in theoretical sampling, “the researcher is not sampling persons but concepts. The researcher is purposely looking for indicators of those concepts so that he or she might examine the data to discover how concepts vary under different conditions” (Corbin & Strauss, 2008, p. 144). Once the first set of data was collected and analyzed, any emerging theories influenced future data collection and analysis.
Initial concepts identified in the data are grouped into categories that eventually become well developed. Ultimately, theoretical saturation, another aspect of grounded theory, may be reached. It refers to “the point in analysis when all categories are well developed in terms of properties, dimensions, and variations. Further data gathering and analysis add little new to the conceptualization, though variations can always be discovered” (Corbin & Strauss, 2008, p. 263). Theoretical saturation remains one of the most misunderstood concepts in grounded theory research (Corbin & Strauss, 2008).

How a researcher determines that theoretical saturation has been reached has been debated. Charmaz (2014) expresses concerns about “foreclosing analytic possibilities and about constructing superficial analyses” by potentially claiming theoretical saturation prematurely (p. 215). Similarly, Dey (1999) contends that the term saturation has been misused as a reflection of the researcher’s surmise and prefers the term “theoretical sufficiency” (p. 257).

**Grounded Theory in My Study**

After the first couple of interviews were completed and transcribed, the analysis process began. The first step in the analysis was open coding, which involves “fracturing” or “breaking open” the data (Punch, 2014, p. 180). It requires multiple readings of the transcribed interviews followed by assigning “bits of ‘raw data’ to categories” and “[c]areful scrutiny” of the data” (Denscombe, 2010, p. 115). The outcome of open coding is a set of conceptual categories generated from the data. Coding allows me to “define what is happening in the data and begin to grapple with what it means” (Charmaz, 2014, p. 113). The qualitative software NVivo was used for the data analysis as it enables “more efficient interrogation of its databases” (Crowley, Harre, & Tagg, 2002, p. 195). Several categories (referred to as nodes in NVivo) were created based on key findings, including the advantages of using digital technology and examples of teaching with
digital technology.

The second step in the analysis was axial coding; it involves “interrelating the substantive categories that open coding has developed” (Punch, 2014, p. 184). After open coding, data are put back together in new ways and connections between categories are made (Corbin & Strauss, 2008). As the analysis developed in this study, more nodes were created, with some of them relevant in more than one interview (e.g. pedagogy for digital technology). In total, approximately 110 nodes were developed after merging and collapsing nodes and sub-nodes. Sub-nodes fall under a main node, which represents a core category, similar in form to a hierarchal tree. For example, a core category/node was ‘approach to pedagogy’ while the sub-nodes included assignments, format of each class, and community building with pre-service teachers.

Table 3: An Example of Grounded Codes and their Grouping.

<table>
<thead>
<tr>
<th>Coding Stages</th>
<th>Example of grounded codes and a core category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Coding</td>
<td>- Digital technology - Advantages</td>
</tr>
<tr>
<td></td>
<td>- Digital technology - Challenges</td>
</tr>
<tr>
<td></td>
<td>- Use of social media</td>
</tr>
<tr>
<td></td>
<td>- Pedagogy for digital technology</td>
</tr>
<tr>
<td>Axial Coding</td>
<td>Digital technology in teacher education programs</td>
</tr>
<tr>
<td></td>
<td>- Digital technology - Advantages</td>
</tr>
<tr>
<td></td>
<td>- Digital technology – Disadvantages</td>
</tr>
<tr>
<td></td>
<td>- Examples of digital technology use</td>
</tr>
<tr>
<td></td>
<td>- Use of social media</td>
</tr>
<tr>
<td></td>
<td>- Limitations of digital technology</td>
</tr>
<tr>
<td></td>
<td>- Institutional support for digital technology</td>
</tr>
<tr>
<td></td>
<td>- Pedagogy for digital technology</td>
</tr>
<tr>
<td></td>
<td>- Remaining current</td>
</tr>
</tbody>
</table>

Once nodes were identified, they were sometimes deleted or merged with others, depending on key findings that emerged as the analysis of data progressed after every
interview. This is achieved by using the constant comparative method so that “the researcher can never lose sight of the data, or move the analysis too far away from what is happening on the ground” (Denscombe, 2010, p. 116). According to Punch (2014), “[c]omparing concepts and their properties at a first level of abstraction enables us to identify more abstract concepts…[and] is therefore essential to conceptual development at all levels in the analysis of qualitative data” (p. 179). The use of NVivo also facilitates double and triple coding, thus allowing the inclusion of certain data under multiple nodes.

The final step in the data analysis process was selective coding, which “deals with what is central in the data analytically, not simply descriptively” (Punch, 2014, p. 185). The comparison between and refinement of categories that takes place as a result of selective coding represents how emerging theories “need to be inferred from the data by induction. This inductive inference is the process of abstraction” (Punch, 2014, p. 185). The framework put forward by Ottenbreit et al. (2010) that conceptualizes the uses of digital technology was a reference point for analyzing the LTEs’ practices; however, it is generic and not discipline-specific (i.e. they do not address literacy teaching directly).

**Limitations**

It is important to recognize the limitations of this study. For example, the sample size of four LTEs is small, making it difficult to generalize the findings to a wider population of LTEs. Since the subset of participants are all practicing professionals in the U.S.A., some of the findings and conclusions are bound by specific contexts and influences, further reducing the generalizability of the findings.

In addition, the main data source for this study were interviews, which provided rich insight into the participants’ roles, practices, and perceptions. However, observing the LTEs’ teaching would have provided an additional dimension to the data analysis that could have enhanced the depth of the results and provided a fuller picture of their
practices and approaches to pedagogy. Geographical distance made in-person interviews challenging and less feasible than the videoconferencing that was used.

**Ethical Considerations**

The research study described in this thesis took place within a large-scale SSHRC study, *LTEs: Their Backgrounds, Visions, and Practices*. It was granted approval by the University of Toronto Research Ethics Board and its principal investigator is Dr. Clare Kosnik at OISE, University of Toronto. As a graduate student, I was a member of the research team with approved access to the data.

When conducting research, “researchers have no privileged position in society that justifies them pursuing their interests at the expense of those they are studying – no matter how valuable they hope the findings might be” (Denscombe, 2010, p. 329). Participants were notified of the study’s purpose and their role in it. They received a letter of informed consent that outlined issues of confidentiality, anonymity and the right to refuse participation at any time. They agreed to participate in the research study and pseudonyms were used when referring to them and their institutions.

**Conclusion**

This chapter discussed the research methodologies that framed this study. It began by examining aspects of qualitative research that made it well-suited for use in my study. The research design, as well as participant selection and data collection sources, were then outlined, with a focus on the format of the interviews conducted and their specific content. Furthermore, a modified grounded theory approach was introduced and justified for the purpose of this study. The chapter concluded with the limitations and ethics related to the present study. In the next chapter, the research findings from the four participants are presented and discussed.
Chapter 4: FINDINGS

Examining the four participants’ backgrounds, visions, and practices allowed me to identify some areas that provided insight into the LTEs’ professional lives. In this chapter, I present four aspects of their work as LTEs that aid the study’s purpose of shedding light on their uses of digital technology. They are: attitudes toward literacy instruction, attitudes toward digital technology, goals for using digital technology, and barriers and supports for using digital technology.

Participant Profiles

*Hope* has been an LTE for 2 years and had spent 8 years teaching in an elementary classroom setting. Her doctorate degree studied writing instruction preparation in two elementary teacher education programs. She teaches courses on academic language and literacy at the graduate level. Hope uses digital technology in the form of PowerPoint, recorded videos and synchronous same-screen collaborative interfaces.

*Caterina* has been an LTE for 10 years and had spent 15 years teaching in an elementary classroom setting. Her doctorate degree focused on action research and writing practices that students use in collaborative writing. She teaches courses on the development of language and literacy education, critical literacy, and teaching literacy to young children at the undergraduate and graduate level. Caterina uses digital technology in her online courses to build community and through platforms such as Voice Thread.

*Hailey* has been a LTE for 20 years and had spent 6 years teaching in an elementary classroom setting. Her doctorate degree examined women joining the teaching profession as a second career. She teaches literacy methods courses at the graduate level. Hailey uses digital technology in the form of PowerPoint, Google Docs, videos, and photography.
Demerra has been an LTE for 23 years and had spent 8 years teaching in an elementary classroom setting. She teaches courses on literacy assessment, evaluation and theory at the graduate level. Her doctorate degree was on reading. She teaches courses related to literacy assessment, as well as evaluation and theory at the undergraduate level. Demerra uses digital technology through PowerPoint, Adobe Connect, iPads, video recordings, and software such as Zoom in her data collection and analysis.

Attitudes Toward Literacy Instruction

The four LTEs in this study utilized digital technology in many ways, all of which supported student learning rather than simply teaching the how-to knowledge of using a specific tool. Hope captured this sentiment when she said, “For me, it’s more about thinking about what it is I want students to learn and what the tools that are available to make that happen [are]. So I take it [as] more of a problems of practice thing.” Rather than simply finding out what technologies other faculty are using, her motivation stems from wanting to help students develop their understanding of literacy, address areas of struggle, and create an engaging classroom atmosphere to go beyond traditional lecturing.

Similarly, Demerra recognized and welcomed the excitement surrounding digital and multiple literacies but insisted that literacy is also about problem-solving and strategic thinking. “Whether you’re encoding or decoding. I mean, you have to be thoughtful, and so for me, it’s experiences. Not reacting but thoughtfully thinking and acting on situations.” In addition to encouraging her students to be reflective, Demerra strived to make connections between literacy, life-long learning, real situations and contexts with her students; therefore, she avoided lesson plan reflections that are structured as “here’s what I did; here’s what they did; here’s what I’m going to do next.”

Hailey also discussed literacy as extending beyond the classroom, especially the English classroom or the language arts classroom. She commented, “Over the span [of]
my career as a literacy teacher, that's become very important to me to know that I'm fulfilling a lot of educational needs, not just one content area. That [literacy] is broader than just one content area.” Additionally, when asked about the qualities of effective literacy teacher educators, she described them as “looking at people, seeing what they know, helping to identify what they know, accepting them wherever they are even when their paradigm is very different from yours, [and] validating it. And then finding ways to weave in new information.” The emphasis in her practice is on better understanding what pre-service teachers are thinking, which has influenced her to start “questioning the world and helping others to question the world.” Her pedagogy for teaching extends beyond the simple transfer of information and best practices.

The approach to literacy education described by Hailey above addresses what Caterina identified as poor practice in teacher education and the pitfalls of a teacher-directed pedagogy with little student input. Caterina did not support the notion of a teacher educator who “goes in with an attitude…or a disposition that she has all the answers, and doesn’t listen to where the students are, to bring them to the next stage of their development.” Instead, as an LTE, Caterina listens to her students “about how they learn best or what they need to do well in a course.” Also, she strives to “teach compassion in ways that would be meaningful for students so that…they are reading books and they are talking and thinking critically about topics that are related to just being an ethical person.”

The views of the participants toward literacy instruction are not rooted in the goal of transferring knowledge of using digital technology such as PowerPoint and other online platforms. Instead, the emphasis is on authentic learning experiences coupled with a student-centered approach that encourages participation, the sharing of best practices, and engaging with issues related to literacy teaching and learning. Demerra summed up
what she wants her students to take away without explicitly mentioning technology.

She explains,

I want students to come away with is an understanding of the relationship between ways of thinking and doing in their discipline or content area and the language and literacy practices that are embedded...in that endeavor. And I want them to be able to begin to see what those demands are and have a repertoire, a small repertoire of high leverage practices to support students in those areas of need.

The high leverage practices she discusses undoubtedly include differentiated instruction and the use of multimodalities and technology, but at its core, her approach, like the other participants, is about preparing pre-service literacy teachers to succeed in their classrooms and address student needs.

Attitudes Toward Digital Technology

All the participants believed that digital technology plays a significant role to play in teacher education, as shown in Table 4. Both Hailey and Caterina suggested its integration throughout the program. In particular, Hailey noted that “the digital should not be there for the sake of digital technology. It has to enhance the goals and instructional strategies of the class, so it has to be meaningful [and]...fully integrated or there’s no sense in it.”

Table 4: Place of Digital Technology in Teacher Education.

<table>
<thead>
<tr>
<th>Place of Digital Technology in Teacher Education</th>
<th>Number who identified low/medium/high</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium-High</td>
<td>1</td>
</tr>
<tr>
<td>High</td>
<td>2</td>
</tr>
<tr>
<td>Very high</td>
<td>1</td>
</tr>
</tbody>
</table>

As expected, the participants also highly rated the importance of using digital technology in teacher education, as shown in Table 5. Demerra shared an example of a
pre-service teacher whose interest in video games and young boys’ literacy meant that he valued knowledge on technology use that would enable him to better connect with students in his classroom. As a result, she deemed it very important to acknowledge the relevance of technology to the classroom and know how to use it.

Table 5: Importance of Using Digital Technology in Teacher Education.

<table>
<thead>
<tr>
<th>Scale 1-5 (1 being the lowest; 5 being the highest)</th>
<th>Importance of Using Digital Technology in Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1.5 (Low)</td>
<td>0</td>
</tr>
<tr>
<td>2/2.5 (Low-Medium)</td>
<td>0</td>
</tr>
<tr>
<td>3/3.5 (Medium)</td>
<td>0</td>
</tr>
<tr>
<td>4/4.5 (Medium-High)</td>
<td>1</td>
</tr>
<tr>
<td>5 (High)</td>
<td>3</td>
</tr>
</tbody>
</table>

Although the participants recognized the importance of digital technology in teacher education, it did not automatically imply that they were comfortable using it. Also, their assigned importance did not gauge their actual use of it as LTEs. When asked about their comfort level using technology and their actual use of it in courses, they responded positively, as shown in Table 6. This was unsurprising since purposive sampling meant that the LTEs in this study were information-rich cases.

Table 6: Comfort Level vs. Actual Use of Digital Technology in Teacher Education.

<table>
<thead>
<tr>
<th>Scale of 1-5 (1 being the lowest; 5 being the highest)</th>
<th>Comfort Level Using Digital Technology in Courses</th>
<th>Actual Use of Digital Technology in Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1.5 (Low)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2/2.5 (Low-Medium)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3/3.5 (Medium)</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
The comments that followed their ratings emphasized that they were unaware of how their practices compared to others and that there is more to learn. For instance, Demerra highlighted that she would like to improve her use of iPads in assessment. Despite her high rating, Hope would like to continue exploring how to best use digital technology, while Caterina, whose courses are fully online, also admitted that she has more to learn and remains uncomfortable with some aspects of her digital technology use.

**Goals for Using Digital Technology**

The participants’ use of digital technology extended beyond simple information delivery. It was not used in basic, fundamental ways. Although Demerra admitted to “death by PowerPoint”, that only represented a fraction of her digital technology use. Similarly, Hope shared her disappointment during an observation where she witnessed teachers using PowerPoint in ways that did not promote a multiliteracies approach and was neither “digitally dynamic” nor multimodal.

After examining the varied uses by the LTEs, three goals were identified, all of which were achieved in different contexts and ways. They are: deepening student knowledge through authentic learning experiences, fostering a sense of community through collaborative environments and reflecting on best practices through exemplar interrogation. Though they are presented as three distinct goals to help frame how digital technology is used by the LTEs, they are interconnected, especially since authentic learning experiences involve reflection and contribute to building a sense of community.
Deepening Student Knowledge

Authentic learning experiences in teacher education programs deepen students’ knowledge on the topic being examined. Since the courses discussed by the LTEs were literacy-related, pre-service teachers had the opportunity to gain a better understanding of what literacy is and how it manifests itself in classroom practice. Although Caterina admitted that her preferred style of learning is reading and writing, she recognized that it is not necessarily her students’ mode of learning and strived to incorporate visuals and videos that were relevant to the classroom discussion.

Caterina used platforms such as Voice Thread, PowerPoint, and Adobe Connect. She encouraged her students to experiment with the multimodal nature of the software by embedding visuals, videos, and audio recordings in their presentations. They were also given the opportunity to narrate their PowerPoints while interacting with their peers in real-time using a live video. The synchronous nature of the activity allowed the class to be “together”, though the course was delivered entirely online. Furthermore, the use of Adobe Connect allowed her students to examine multiple documents simultaneously.

In one activity, Caterina’s students were doing author studies, book talks, and literature circles. She reported that some students used PowerPoint in very innovate ways, while others chose platforms such as YouTube and Presio. Students enjoyed a certain level of freedom with regard to how they could present their work, which allowed them to experiment with new ways of sharing their knowledge. Furthermore, Caterina had set up blogs with her students that they continued using while doing their practice-teaching, which created a social connection that was neither required nor marked, but allowed the students to express themselves and demonstrate their learning after the literacy methods course had ended. The use of blogs contributed to bridging the pre-service teachers’ academic program and their teaching practice.
Hope utilized a platform called Canvas in her teaching, which involved students working in a room where all the walls were white boards. Students were seated in groups and could synchronously contribute to the classroom using visuals and microphones while the instructor recorded the classroom session. The instant ability for students to share a video or what they were writing or thinking with their peers created an engaging classroom environment. Hope believes that digital technology “affords them a lot more opportunity to get ideas, to develop content, to see images of how other people have done things, [and] to look at samples of student work.”

In addition, she believed that videos of her students’ actual teaching practice can be brought back to the classroom to serve as the focus of a discussion; it became an instructional tool that “provides a model of practice that we can then unpack”. According to her, the opportunity to use first-hand videos is “a closer representation of practice than reading a vignette or talking about what you do.” It is important to note that students are represented in the classroom material that facilitates and enhances class discussions. Also, the use of real-life samples of practice is evidence of an authentic integration of students’ realities from outside the walls of the teacher education classroom.

Hailey also had her pre-service teachers share and comment on video clips of themselves working with students. Her rationale is, “We’ve talked about it in class, they’ve read about it in texts, but when they see somebody actually doing it, and when it’s somebody that they know, they look at it with different eyes.” Overall, Hailey believed that it “broadened their understanding of…what they could do, how to talk about it, and how to work collaboratively in a coaching situation.” As an instructor, digital technology has influenced her own learning. She commented, “Because they’re able to express [themselves] through different media, both individually and collaboratively, it’s given me a totally new understanding of what they know.”
One assignment Hailey utilized involved students photographing places where traditional and non-traditional literacy instruction (e.g. an aquarium) take place. Students reflected on their photographs by connecting them to their readings and sharing them with the entire class. Hailey discussed the “gift of time” as benefiting her students since asynchronous forum posts allowed students the opportunity to reflect more thoroughly on their learning. At the same time, she could provide feedback more quickly when students submit their work electronically rather than waiting for an in-person opportunity. More immediate feedback, combined with a collaborative examination of pre-service teachers’ in-class practice, provide the students with a learning environment that is reflective of their experiences and allows for personal and professional growth.

Demerra used platforms such as Adobe Connect and Zoom in her teaching. She emphasized the importance of having a synchronous learning environment which she admitted benefits both her and the students. In having discussions as an entire class, as well as in small groups, she attempted to use an approach to pedagogy similar to a regular class without having to compensate for the lack of students’ physical presence. Like Hope and Hailey, she also utilized videos of teacher practice to help illustrate concepts of and stimulate discussion on literacy teaching and learning. Also, she described using iPads in class with the intention that pre-service teachers would also be able to use them throughout their practice teaching.

Interestingly, Demerra discussed her own use of digital technology in aspects of her research. She described it as “developing modules…about comprehensive literacy and working with children with high disability. It’s mostly a lot of teachers, we’ve videotaped them teaching with their children and demonstrating these different things you can do in literacy.” She also used Zoom in her research and would record participants in the study, as well as her discussions with pre-service teachers who were doing self-study.
Her use of digital technology provided students with the opportunity to contribute comments to a shared space and use video as data in projects. Lastly, Demerra shared a story of a graduate student doing action research that involved working with children and using digital video in different ways to demonstrate their learning. It was a student-led project that incorporated the use of digital technology very effectively.

**Fostering a Sense of Community**

The LTEs in this study created and maintained learning experiences that were collaborative in nature. In other words, they invited interaction among peers, which over time can foster a sense of community. Caterina, who does not get any face-to-face time with her students, in an effort to bring them together as a community, decided to create an online space known as the water cooler. She summed it up fittingly,

> It’s a place where I don’t grade them. I don’t even go in there every day. I just drop in every once in a while to see what’s going on. Sometimes they’re sharing pictures with each other. But that’s your office water cooler; that’s your place to socialize, to drop in, see what people watched on TV last night, or whatever the buzz is.

Her use of a water cooler activity developed a social kind of community building that she deemed very important. In her opinion, it represented the effective use of digital technology in a way that was specific to her online course. The presence of an informal space hosted in the digital world allowed students to socialize in ways that mimicked in-person interactions.

While reflecting on her pre-service teachers’ use of the internet, Hope mentioned that her students use and maintain a Facebook page for their cohort where they can socialize, vent, and ask questions. She believed it serves a community building purpose, especially since students can find relevant information and stay up-to-date via a more informal communication channel. According to Hope, “virtual locations help draw connections between courses and across the program. [It] is kind of nice to have a virtual
home for that.” Although she does not use social media in her teaching, Hope valued the presence of an interactive online space hosted in the digital world. While using Canvas, she also once had students participate simultaneously in a silent discussion (using text as the only form of communication), and it which proved engaging and productive and contributed to the class discourse.

Hailey, when describing what she holds dear to her heart in terms of her teaching, emphasized the importance of establishing a relationship with students that invites them to “co-construct a community space”. She elaborated on what that relationship constitutes by saying, “What that means to me is being honest, being transparent, being vulnerable, being willing to change and knowing how to listen; and to expect the same, that same kind of professional integrity from them as they respond to me.”

One of Hailey’s highlights of digital technology use was the online forums, “where students really take what they know and share it and support each other’s growth.” She observed that over the course of the semester, her students “became more of an integrated group, and so they valued each other more”. Lastly, her use of students’ practice teaching allowed her preservice-teachers to observe “how different children can be…[and] how differently other colleagues can interact in different ways…[W]hen they give each other feedback, they begin to build a much more intimate and meaningful discourse community.”

The potential for community building was not limited to fulfilling a social need. It also encouraged the formation of collaborative networks and safe spaces where discussions on any topic could take place. Fostering a sense of community was made possible through the intentionality behind the LTEs’ choice of activities rather than the exclusive use of a specific digital tool. A sense of community was more easily fostered when students enjoyed their participation in authentic learning experiences.
Reflecting on Best Practices

One of the most prevalent uses of digital technology was to interrogate exemplars of teaching through the use of videos, some of which were student-generated and represented the pre-service teachers during their practice teaching. The LTEs encouraged the use of videos since it provided an authentic first-hand look at what the theory being studied and negotiated looks like in practice.

Hope discussed how her use of a commercial video depicting a classroom scenario intended to provide insight into English language learners. The video consists of a teacher discussing a word problem about a person walking three blocks. What follows on screen is a digitally-created visual animation of how the language learner interpreted it. The viewer sees a stick figure walking with three blocks in hand and a Spanish-speaking peer having to clarify his misunderstanding of the word “blocks”. Hope described it as even more beneficial than a regular video of classroom instruction since it had “a way of magnifying time at certain points to help people see what they might not see” otherwise. Students were then able to discuss themes, dilemmas, and questions they had, many of which served as big ideas throughout the term. Since students are constantly unpacking their practice, there are many opportunities for growth as pre-service teachers.

As mentioned previously, Hailey also used videos of students’ practice teaching, which her students enjoyed because they saw their peers using activities and approaches to teaching that may have been similar to their own but executed very differently with the same end goals in mind. When students examined their peers’ videos, they were invited to share their reflections while also making connections to the readings. Hailey emphasized reflection as an important aspect of her students’ development, which also in part had influenced her own practice. She said, “I totally changed my vision of assessment because I learned that there were people who could see things but cannot yet
do them…they could name what each other was doing, which of course reinforced their professional language.” In addition, discussions provided her with what she describes as a “different lens into how students think, how they construct knowledge, [and] what they know.”

Demerra recognized that the ability to record what one is doing or has done and share it with the class almost instantly was “fantastic from a reflective feedback stance.” It improved the quality of her classroom discussions because the whole class had easy access to the visuals, and she did not have to rely on numerous equipment to help further engage the students in the topic being discussed. On a similar note, Demerra pointed out that ease of access to examples of practice, both good and bad, required pre-service teachers to critically examine what they were watching and avoid assuming that whatever they saw on screen was exemplary practice. She emphasized that she purposefully used video recordings of tutoring to show her students “little vignettes and [have them] give feedback about what they think is going on” followed by a discussion on their insights.

The LTEs’ goals for using digital technology in the classroom varied. They succeeded in creating a collaborative environment that provided authentic learning experiences and exemplar interrogation. As a result, students were able to deepen their knowledge on issues related to literacy and literacy teaching while participating in a classroom setting that promoted sharing feedback and provided easy access to materials for use in teaching. Additionally, the development of reflective and critical practices, which involved video case studies, analyzing photographs, and blog sharing, was achieved by the LTEs’ ability to bridge practice teaching and the academic program. This goal of connecting the students’ experiences in K-12 classrooms with their teacher education program is achieved through the LTEs’ pedagogy, which creates an environment that fosters a collaborative, social, and academic community. In other
words, the LTEs’ goals are interconnected and negotiated simultaneously throughout their courses.

**Supports and Barriers to Using Digital Technology**

Digital technology in the LTEs’ courses was implemented in different ways and to varying degrees. Examining the supports and barriers that they faced while using digital technology can provide insight into their rationale behind the adoption or avoidance of certain practices, many of which are context-specific.

Caterina admitted that while the use of digital technology opened many doors, it was also inhibiting in the sense that her connection to her students was different compared to her experiences with face-to-face teaching. Since the courses she taught were exclusively online, she needed to adjust her approach to teaching and choice of digital tools. One of the digital tools she attempted to incorporate was blogs on Blackboard; however, her unfamiliarity with the platform, combined with students’ high comfort level using an existing discussion forum, prompted requests to abandon the blog but continue to engage in ‘blog-like’ activities. Though the specific tool had been abandoned, the pedagogical aim was not compromised. She also admitted that she found it challenging to keep up with latest tools available. However, this does not dissuade her from attempting to use different tools and evaluating what works well for her.

In terms of support, Caterina noted her easy access to her institution’s Information Technology (IT) department, which responds in a timely manner to inquiries regarding the acquisition of new tools to best suit her needs or troubleshooting the use of existing ones. When her campus adopted Blackboard, numerous training sessions were offered, which helped build a community of teachers across campus. The community of teachers frequently discusses the usefulness of specific instructional strategies and software, which has established an on-going dialogue among them. Moreover, since Caterina’s institution
has seen increased enrollment in online programs, a position has been created for a director of technology and online teaching, which will influence discussions on best practices, program offerings, and policies.

Hope shared her use of a software program called Studio Code, which allowed her to digitally analyze video recordings of her research, as well as present her coding in video format. The initial start-up cost of acquiring the software was high, but she did receive training sessions on how to use it and was compensated for attending. She also felt supported when she decided to use the Canvas with her students and was offered a week-long fellowship by her institution to learn how to operate it and adapt it for classroom use. In fact, she eventually began facilitating follow-up training workshops for the faculty since she was very comfortable using it, akin to an expert.

Additionally, her institution’s IT department has been very helpful by addressing her need for more digital storage and setting up file-hosting services such as Google Drive. Despite receiving adequate technical support, Hope struggled to find videos on disciplinary literacy, an important subject in the course she teaches. It was therefore easier for her to model it in-person rather than show a video that did not fully capture what she wanted her students to learn. This example does not depict a challenge of using the tool (videos), but rather highlighted a shortage of digitally-mediated resources on certain areas of pedagogy, which was discouraging for her.

Hailey was highly critical of her institution’s lack of support for using digital technology. She voiced her displeasure with the decision to adapt a new digital platform across the university, which she believed was a decision made based on money rather than pedagogy. More importantly, only some professional staff received training on how to implement it effectively. Lastly, she discussed the use of Wikis but found them to be ineffective as they simply became a place to find information rather than interact with
colleagues. Although Wikis were not popular with her, that does not preclude the tool from potentially being beneficial to other instructors based on their needs.

Demerra shared her enthusiasm regarding her institution adopting new technologies such as Adobe Connect and more recently Zoom. She described an institutional push to use the latest technology, which was supported with frequent updates and training sessions. Since the department of Continuing Education supports the use of Adobe Connect, faculty members are encouraged to use similar platforms in their teaching.

One observation she made was about the training sessions that the faculty had attended. Demerra described the presenter, a tech-savvy person, as having struggled with talking about the technology to everyone since it was new to her too. The rapid introduction of new technology at the university elicited excitement and interest but at the same time placed tremendous pressure on the educators to use the technology as soon as possible. For example, she only had a month and a half to learn how to use Voice Thread and will be attempting to use it in an upcoming course. Finally, though not applicable to her own practice, Demerra discussed the increasing use of a blended approach to teaching, which can be interactive depending on how it is designed. However, she cautioned, “I see people moving more toward really relying on the text to deliver the message, instead of engagement, discussion, lecture, and text, and then implementation in the field to see what’s making sense and how it connects.”

In all, the LTEs identified different barriers and supports. Some embraced the institutional support in the form of professional development, while others were critical of the lack of opportunities and support for digital technologies. Certain tools proved more beneficial to some LTEs compared to others who did not see the pedagogical value in adding them to their existing repertoire of strategies.
Chapter 5: Discussion and Implications

This chapter is organized into three main sections: implications for a pedagogy of literacy teacher education, implications for digital technology in teacher education, and directions for future research. Findings from this study will be incorporated throughout.

**Implications for a Pedagogy of Literacy Teacher Education**

Literacy is everywhere. It is integrated into our everyday lives in explicit and implicit ways. When discussing a pedagogy of literacy teacher education, embedding students’ out-of-the classroom experiences in the teaching process is important. Not only does it allow the pedagogy to be relevant to their lives, but it also enhances their engagement with the classroom material, resulting in more permanent learning.

Recent developments related to how we communicate and the tools we use have forced us to reexamine what we mean by the term literacy. Simply put, we can now express concrete ideas using non-traditional text forms, thus rendering the traditional definition of literacy as the ability to read and write incomplete. By moving away from a mechanical conceptualization of literacy, we can begin to discuss it as acquiring a set of skills that allow us to interact with the world around us in different and meaningful ways.

The LTEs in this study held attitudes toward literacy that emphasized a multimodal approach to instruction that countered systemic approaches that are often teacher-centered and one dimensional in nature. The teacher educators, as facilitators of learning, recognized that they have the important task of preparing their pre-service teachers for diverse classrooms. As a result, they encouraged the use of multimodality in their courses, in the form of videos, photographs, graphic illustrators, and other tools through which the candidates could express meaning. The LTEs shared their excitement with regard to students being creative and sharing insights that may not have been possible had they written a traditional paper. More importantly, the pre-service teachers
appear to have benefitted greatly from being able to utilize experiences from their own lives in the classroom. A student-centered approach that emphasizes multimodality reflects the LTEs’ attitudes toward literacy instruction, which undoubtedly will influence how their students think about literacy in their professional lives.

When discussing the use of digital technology as a multimodal affordance in the literacy classroom, the LTEs did not use it as an add-on or for the sake of using it. It was instead part of a pedagogy of literacy education that must consider students’ varied interests. As Lankshear and Knobel (2008) explain,

The point here is not simply to import an array of digital literacies holus bolus into classrooms on the grounds that they are engaging, or because learners who do not experience success in conventional school subject literacies can nonetheless experience success and affirmation as bloggers, gamers, and fan practice aficionados—although that would be no small thing. Rather, the educational ground for acknowledging the nature and diversity of digital literacies, and for considering where and how they might enter into educational learning have partly to do with the text to which we can build bridges between learners’ existing interests in these practices and more formal scholarly purposes. (p. 9)

The many ways through which the LTEs enacted a pedagogy of multiliteracies without a dependence on the digital tools to replace the process of teaching deserves recognition as exemplary practice. Their attitudes toward both digital technology and literacy instruction played major roles in their decisions to adopt certain approaches to teaching.

Goodnough et al. (2015) discuss the importance of considering teacher educators’ attitudes and the pedagogies they use in teacher education. They state,

[T]eacher educators and those involved in the design of teacher preparation programs need to consider program orientations and visions, and personal orientations and beliefs about how to best prepare teacher candidates for the complexities of classrooms and schools. It also involves considering the relationships among pedagogies, the purposes for using particular pedagogies or groups of pedagogies, how they get enacted in practice, and the impact on different types of teacher candidate learning. Moreover, more long-term research is needed to examine how pedagogies adopted in teacher preparation have impacted new teachers’ thinking and classroom practice in their beginning years. (p. 197)
The pedagogies used in teacher education can have long-term effects on the practices of beginning teachers. Therefore, a thorough examination of the work that teacher educators do is an important step in the process of improving teacher education programs.

**Implications for Digital Technology Use in Teacher Education**

The LTEs in this study used digital technology in various ways that could fulfill different needs and achieve different outcomes. They touched upon using technology to deliver information (e.g. PowerPoint) as well as helping pre-service teachers develop technology skills by embedding technology use in assignments and reflections. Furthermore, during their practice teaching, candidates used digital technology to record their interactions with classroom students, allowing them to reflect on their practice at a later time. In addition, the LTEs set good examples for technology integration, which involved modelling both the mechanical and pedagogical uses of digital technology.

Ottenbreit et al. (2010) discussed six approaches to pre-service digital technology integration. They are: (1) information delivery; (2) hands-on skill building activities; (3) practice in the field; (4) observations and modeling; (5) authentic experiences; and (6) reflections. Surprisingly, participants in this study utilized each approach, albeit in different ways and with varying levels of success. What is noteworthy is the LTEs’ commitment to having pre-service students not only learn about why the use of digital technology is important through a presentation or a reading but through interacting with the digital technologies that they may find themselves using as practicing teachers.

The use of videos that modelled practice teaching provided many benefits to both the LTEs and the pre-service teachers. It allowed for honest, thought-provoking discussions on the best practices that enhanced the students’ ability to critically reflect on their learning and relate it to relevant theories of pedagogy. At the same time, the LTEs
gained a deeper insight into the lives of their students and what they know, which provides a perspective that cannot be replicated in a written reflection.

In addition, community building through the use of digital technology was made possible because of authentic experiences and interactions among peers. This recognizes that students socialize in different ways that extend beyond face-to-face interactions and take place via digitally-mediated platforms (Alvermann, 2010). Instead of assuming that the use of online technologies may somehow inhibit community building, the LTEs made a conscious effort to provide a learning environment that allowed for collaboration and facilitated the formation of meaningful relationships.

Additionally, the presence of support for the use of digital technology, whether in the form of institutional support or support from community members and fellow practitioners, can mitigate feelings of unfamiliarity with digital technology. Although remaining current may have been a challenge for some LTEs, that did not preclude them from having an attitude that encouraged trying new tools. If teacher education programs want to integrate digital technology, then learning about the attitudes of teacher educators toward it and providing the necessary support to help them succeed, are of utmost importance.

In attempting to answer the question, “How can we influence informed design in educational technologies (ET) that enhance learning?”, Price and Kirkwood (2014) state,

[I]nformed design of ET interventions needs to be grounded in a better conceptualization of what constitutes and shapes learning rather than a focus on technology as the primary agent of change. Further, contextual factors relating to the environment within which teaching and learning takes place often influence uses of technology to a greater extent than is usually acknowledged. (p. 341)

The authors’ points are important to consider moving forward since they recognize the influence of technology but encourage practitioners and researchers to not lose sight of the learning process and the pedagogical aims associated with their technology use. Also,
research focused on digital technology use must consider the multiple factors that are involved in educators’ decision to engage with digital technology in different capacities. In an effort to build academic discourse surrounding the use of digital technology in higher education, Kirkwood and Price (2014) make this suggestion, “The sharing of ‘good practice’ and ‘lessons learned’ among members of the higher education community can help academic teachers to concentrate on effective uses of technology and to avoid the unnecessary duplication of effort and expense” (p. 7).

**Directions for Future Research**

This study has highlighted the uses of digital technology in the practices of four LTEs. One of the aforementioned limitations of this study was the small sample size. In order to paint a clearer picture of the professional lives of LTEs, further research is required.

First, the LTEs in this paper were all based in the USA, and although the larger study also involved participants from Canada, Australia, and the UK, there is room for examining teacher educators from non-English speaking countries and also countries where English is not the main language of instruction. Another potential area of research is the use of digital technology across subject areas in teacher education and how its use may vary depending on the discipline.

Furthermore, rather than solely examining the practice of teacher educators, future studies can also consider how pre-service teachers use digital technology once they become practicing professionals. This may provide insight into how much influence the LTEs’ use of digital technology had on the development of the teachers’ own pedagogy and attitudes. Whether the participants are pre-service teachers or teacher educators, the choice of a longitudinal study can offer in-depth information about the changing attitudes and evolving practices of professionals in the field of education.
References


Appendix A: Interview #1

a) Background
1. Tell me about your work experience here at the university (when did you join the faculty, what is your rank, have you had leadership positions).
2. What jobs/positions did you have prior to joining the university (e.g., teacher)?
3. Tell me about your educational background. What degrees do you hold? Where did you do your schooling? What were your major areas of interest?

b) Influences on Your Current Practice
4. Thinking about your previous educational experiences and work experiences which do you see as being the most useful in your current work as a literacy teacher educator?
5. If you were a classroom teacher tell me about these experiences. To what extent do you draw on your experiences as a classroom teacher in your current work as a teacher educator? How do you draw on them?
6. Do you tell your student teachers about your educational and work experiences? Why do you? Why do you not?
7. How important is it to the student teachers that you were a classroom teacher? Why do think it is important?
8. When you go into a school, what is your comfort level?

c) Qualities of a Teacher Educator
9. What background work experiences do you think are important for a teacher educator?
10. To what extent are you able to stay current with the educational trends and priorities in school districts?
11. To what extent should teacher education programs prepare students to implement the initiatives of the school district? the government ministry/state department of education?
12. Can you provide a job description for a literacy teacher educator?
13. How did you acquire skills for teaching adults?

d) Knowledge + Academic Community
14. What qualities/strengths do you feel you bring to literacy teacher education? Now, let’s look on the flip side, do you feel there are any gaps in your knowledge for being a literacy teacher educator? What are they and why do you feel this way?
15. Can you tell us about your reading habits?
16. Can you tell us about your own early school experiences with literacy? (see if there is a connection between them and their views)
17. What journals do you go to – your favourite must read or the ones you turn to for your teaching or writing?
18. What conferences do you go to?
19. Which is your academic community?
20. Do you have a community of scholars in your university?
21. Thinking about your life – from preschool to where you are now, were there any turning points in your career? (Draw out the timeline)
e) Identity

22. What qualities do you feel that you bring to your work as a literacy teacher educator?
23. When you are asked by someone outside of the university (e.g., someone you meet at a social gather) what you do, how do you describe your job/profession (teacher educator, literacy researcher)?
24. Which of these terms best describes you:
   - teacher educator
   - literacy professor
   - literacy educator
   - researcher
   - teacher
   - hybrid teacher and teacher educator
   - other
25. How comfortable are you being labelled a teacher educator?
26. In your university, how do you feel that you are perceived and assessed by faculty in your department? Outside of your department/school of education? Do you feel that as a teacher educator you are perceived differently than a scientist or a professor of English literature?
27. Is there a hierarchy in your university?

f) Experiences with research.

28. Tell me about your experiences with research.
29. If you have a Ph.D. what was your area of research? How well is that research connected to your current work as a teacher educator? Had you always planned to get a Ph.D.? If no, when did you decide to pursue a degree? Why did you do this?
30. Would you like to have a greater involvement in research? If yes, what are the barriers to doing research?
31. Do you tell your ST about your research?
32. Do you think it is important for teacher educators to be doing research? If yes, why? If no, does this present any problems?
33. Should classroom teachers be encouraged to be researchers?
34. If you have written any books, who are they written for? (teachers, researchers, teacher educators)

 g) Other experiences

35. Tell me about any other education-related experiences that you have had (e.g., writing literacy textbooks for students, external consultant for an organization).
36. To what extent have these experiences influenced your practice as a teacher educator?

Any other comments you want to make about being a literacy teacher educator are welcome.
Appendix B: Interview #2

a) Framework and goals for your literacy course(s).

1. Tell me which literacy courses you teach. How many years have you been teaching these courses?
2. Choose one literacy course that you teach or have taught and this course will be focus of this interview. What is the name of the course and how often have you taught it?
3. Let's talk first about some of the logistics of this course.
   a) How many classes? How long is each class? How many students in the course? Do you have a TA?
   b) At what point in the student’s program do they take this course?
   c) Is this a survey course or can you go in depth with the topics?
   d) Do you the students do a practice teaching placement before, during, or after your course?
4. Having taught this course X times, what has surprised you about the students' reaction to it?
   a) In general, how do students respond to your course?
   b) Possible probe – course evaluations
5. Would you describe your course as organic in nature (topics develop from the students) or is it fairly pre-set?
6. What topics do you cover? (Can I have a copy of your course syllabus?)
7. What do you think students need to know?
8. What are the particular goals for this course? How did you determine these goals? Why are these goals important for beginning teachers?
9. What is the balance between theory and practical teaching strategies?
10. To what extent are you able to connect your course with fieldwork/practice teaching?
11. Which literacy theorists resonate with you?
12. Which literacy researchers do you feel that student teachers must learn about?
13. Do CR teachers come into the ac program to deliver any of the lectures/sessions?
14. Do you feel that you have the necessary support from your department to deliver/teach your literacy course?

b) Pedagogies used and reasons for using them.

15. Are there other sections of this course? Do you use a common syllabus? How much freedom do you have in designing this course? How similar is your course to their course?
   On a scale of 1-4 with 4 being the highest, to what extent is your course similar to other sections?
16. Tell me about your teaching style.
17. Do you have a typical structure/organization for each of your literacy classes? (e.g., always start with lecture, usually have small group discussion)
18. What do you feel are some of the highlights of this course? For you? For the student teachers?
19. What do you find most challenging about teaching literacy courses?
20. Do you model your course on a particular literacy/English professor or classroom teacher?

21. Is there something that you hold dearly to your heart that you want to be part of your teaching?

c) Assignments and Readings

22. Do you use a textbook? Why have you chosen this book or series of readings?

23. To what extent do you use children’s literature/YAL in your teaching? How do you use it?

24. What assignments do you assign? Why have you chosen them? What do you feel the students learn from these assignments?

25. Would you describe your requirements as demanding, just right, not too heavy?

26. Are you able to assign the assignments that you want? Or are you limited by certain factors (e.g., other demands in the program)?

27. Is there anything that you would like to change about the course? Timing. Length. Topic. Sequence in the program.

d) How and why your views and practices have changed over the years.

28. You have been a teacher educator for X years. Looking back on these years, how has your practice as a literacy teacher educator changed? Why have they changed?

29. How much did your own teacher education program influence how you work as a teacher educator? (if applicable)

30. How much has your own experience as a classroom teacher, consultant, principal influenced your practice as a teacher educator? (if applicable)

Any other comments you want to make about being a literacy teacher educator are welcome.
Appendix C: Interview #3

Thank you for agreeing to do a third interview. So how has it been going since we last interviewed you?

a) Updating Your Activities

1. How has it been going?
2. What have been some highlights of your work this past year?
3. On the flip side, have there been any challenges you want to tell me about?
4. Have there been any significant changes in your teaching responsibilities and/or your research activities?

b) Teacher Education Programs

In this section, we want to ask you about your views on teacher education programs.

1. As we know from the literature and our own experiences all of teacher ed is not ideal. We do not want to put you in a difficult position but we are really interested in what you consider to be poor practices in teacher ed.
2. What would you like to see in your literacy teacher ed program that is currently not part of it?
3. Have you noted any contradictions in your work as an LTE? (if stuck prompts – practice teaching, mission statement of uni, deployment of funds …)?
   - What topics should we be addressing as Literacy/English Teacher Educators?
   - Do you feel the political pressure in your context is affecting what you can do in your literacy teacher course?

c) Digital Technology

4. In our 21st century context, what should teaching look like a literacy teacher ed program?
5. What place should digital technology have in a teacher education program?
6. What kind of DT do you use in your course?
7. What does digital technology provide for you as an LTE that is different from what you could do previously?
8. What does digital technology provide for your ST that is different from previous generations of student teachers?
9. What are some effective digital technology practices that LTEs you have seen or heard about?
10. On a scale of 1 to 5 with 5 being the highest, how comfortable are you using DT in your teaching?
11. On a scale of 1 to 5 with 5 being the highest, how important is it for LTEs to be using DT in their teaching?
12. On a scale of 1 to 5 with 5 being the highest, how much do you actually use DT in your teaching?
13. Do you have an example of when you used DT that worked really well? (on a small or large scale)
14. Let’s turn our attention to social media (e.g., blogs, Wikis, twitter, FB, Instagram, google docs). To what extent do you use social media in your course?
15. Do you include digital technology in any of your research, either as a focus or as a means of data collection or analysis?
16. To what extent have you had support from your institution on integrating DT into your literacy teacher ed courses?
17. On a scale of 1 to 5 with 5 being the highest, to what extent do you find it a challenge to remain current regarding DT?
18. To what extent do you use digital technology in your personal life?

d) Personal/Professional

19. Where they would like to be in 5 years, personally and/or professionally? 10 years?
20. Thinking about how you got to where you are on May talking to us …. what would you do differently in your journey?
21. What advice they would you give new LTE