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First Year Teachers' Use of Technology in Literacy Instruction: A Case Study

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FIRST YEAR TEACHERS' USE OF TECHNOLOGY IN LITERACY INSTRUCTION: A CASE STUDY

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Abstract

The purpose of this case study is to determine how first year teachers describe their teacher preparation and use of technology to teach literacy. This is achieved by considering how teachers' descriptions demonstrate self-efficacy, identify challenges and obstacles, and distinguish benefits of technology integration in literacy instruction. As the understanding of literacy broadens to include alternative forms of print and technology, school districts are investing significantly in technology and yet teachers are often not using technology in their practices. For these reasons it is necessary to examine first year teachers' perceptions of their own prior training, their current technology use in the classroom, and their sense of self-efficacy in doing so. A qualitative, instrumental case study is used to explore the perceptions of seven first-year elementary school teachers from a single American school district. Data are collected in a three-step process beginning with participant interviews, followed by a technology asset matrix for participants to complete, and finally, a one-time focus group. Data are qualitatively analyzed using the constant comparative method. The study finds first year teachers feel unprepared by their teacher preparation programs to teach literacy using technology; first year teachers are using some technology in their literacy instruction but identify barriers keeping them from using technology as much as they would like; and first year teachers have high self-efficacy in technology integration to teach literacy with technology regardless of their prior training or sense of preparedness. These findings contribute to the growing body of similar research that confirms that teachers are hesitant to adopt technology into their instruction and current teacher education is inadequate in preparing teachers to do so.

Keywords: first year teachers, literacy, technology, teacher preparation programs, self-efficacy, barriers to use

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Chapter I: Introduction

As technological advances increase at an exponential rate, the field of literacy is changing and with it the definitions of what it means to read and write (Leu, Kinzer, Coiro, Casteck, & Henry, 2013). Literacy is no longer a simple mastery of decoding skills, but a construct with broader meanings and wide-ranging technological, cultural and social implications (Mills, 2010). Yet while students are becoming more digitally literate outside of the classroom, training for new and preservice teachers often remains print-bound in its explicit literacy pedagogy (Ajayi, 2011).

As students spend more time with alternative forms of print, it is the responsibility of educators to expand literacy using technological tools in order to create relevant, timely learning experiences during the school day. Currently, students spend more time interacting with digital technology outside of school than in the classroom (Williams, 2005). In 2010, students between the ages of eight and eighteen spent an average of seven and half hours of their daily time at home using some sort of electronic device (Rideout, Foehr, & Roberts, 2010); in contrast, students only use digital technology in the classroom for approximately 29% of instructional time throughout the year (National Center for Educational Statistics, 2013). In order to bridge the disconnect between home and school, teachers must embrace a broader understanding of the functionality of literacy (National Council of Teachers of English, 2013); they must familiarize themselves with new communication technology that allows students to practice literacy across cultural, social, and economic domains (Cervetti, Damico, & Pearson, 2006).

The National Council of Teachers of English (NCTE) believes the twenty-first century demands that a literate person possess a wide range of abilities and competencies

(National Council of Teachers of English, 2013). These literacies—from learning to read on a tablet to participating in virtual classrooms—are multiple, dynamic, and malleable. Twenty-first century readers and writers need to demonstrate proficiency with technological tools, to solve problems collaboratively and cross-culturally, and to both create and evaluate multi-media texts (National Council for Teachers of English, 2013). The potential of new technologies is likely to be found not in the electronic devices themselves but in the way in which these technologies are used as tools for learning. To take it a step further, the true potential lies in the preparation and confidence of the educators who are presenting these tools to students.

Significant attention has been paid to how universities implement digital technology instruction into teacher education curricula and how in service teachers adopt these strategies in the classroom (Lee & Lee, 2014). While all U.S. teacher preparation programs are required to provide instruction on technology integration (Kleiner, Thomas, Lewis & Greene, 2007), there are different requirements, formats, and approaches at every university. Thus, teachers enter the workforce with unequal and often inadequate technological skills or abilities.

Furthermore, even adequate training and the availability of equipment can't guarantee that teachers will use new technology in their instruction (Hutchison & Reinking, 2011). Internal factors, like self-efficacy and confidence, are greater predictors of technology use in teaching than external factors like preparation, accessibility, and hardware (Ertmer, 1999).

Research Problem

The United States spent an estimated $9.94 billion on educational technology in schools in 2014 (Murphy, 2014), yet many teachers, even those who grew up exposed to technology in their own educations, are not adopting it into their own practices (Mundy, Kupczynski, & Kee, 2012). School districts are investing in technology that is not being used, and students are missing out on learning the twenty-first century technology skills that are necessary for college and careers. We need to understand what is keeping teachers from using the technology that is already available to them in order to address this problem and provide students with the technological education they will require for the future.

To address this growing concern, there has been a significant amount of research conducted on the discrepancies in technology requirements within teacher licensure programs, on the growth of digital literacy in schools, and also on teachers' sense of self-efficacy in teaching with technology. Yet while there is a wealth of information in all three individual areas, there is a dearth of research on how new teachers perceive the influence of their digital literacy training in their teacher licensure programs on their technological self efficacy and practice in their first year of teaching literacy with technology.

Similarly, current research from Hutchison and Reinking (2011) shows that teachers' perceptions of integrating information and communication technologies into literacy instruction play an important role in actual implementation, and yet it is an area that has not been as widely explored as other factors affecting implementation. If teachers' perceptions play a pivotal role in implementation, as Hutchison and Reinking

argue, then further research is required to better comprehend how new teachers' understanding of their past preparation and current practices is influencing technology integration in the literacy classroom.

Research Question

As there is a lack of research on the specific intersection of these subjects and a need to further explore the importance of teachers' perceptions in implementation, this study sought to examine how one group of first year teachers describes their teacher preparation and use of digital technology to teach literacy in the classroom and how they describe the perceived obstacles and benefits of doing so. Specifically, the research question was "How do first year elementary school teachers describe their teacher preparation and use of digital technology to teach literacy in the classroom?" The related sub questions were, "In what ways do first year elementary school teachers' descriptions demonstrate self-efficacy in teaching literacy with digital technology?" "What are first year elementary school teachers' perceived challenges and obstacles to teaching literacy with digital technology?" "What are the perceived benefits of teaching literacy with technology?"

Terminology

For the purposes of this proposed study, the term "digital technology" will encompass a variety of information and communication technologies (ICTs) and associated forms of digital reading and writing. Hutchison and Reinking (2011) argue that a distinction should be made between technological tools that replicate existing instruction and those instruments that address new instructional goals related to digital proficiency. Similarly, Collis and Moonen (2005) have identified two different ways that

digital technologies can be used in education: as a core technology replacing infrastructure or as a complementary technology that adds a new dimension that was not previously feasible. However, for the purposes of this study, both core technology and complementary technology will reside under the term "technology" as this word will cover a variety of electronic technological tools typically found in a classroom setting regardless of their use. In this study, the term "technology" could include a variety of tools like databases, desktop computers, digital cameras, document cameras, DVDs, e-readers, graphics, laptops, library databases, Outliner, podcasts, Presi, PowerPoint, shared editors (wikis), simulations, smartboards, smartphones, spreadsheets, tablets, video cameras, web authoring software, and word processing software.

Literacy has a variety of definitions that continue to evolve (Cambridge Assessment, 2013). For the purposes of this study, I am using the International Council for Adult Education's (2003) definition of traditional literacy, which is "learning to read and write (text and numbers), reading and writing to learn, and developing these skills and using them effectively for meeting basic needs." Furthermore, as this study takes place in elementary school settings with elementary school teachers, traditional literacy will be defined as the ability to decode, comprehend, and produce information at the elementary level.

Another important component of literacy is the term "multiliteracies," which will be explored in-depth in Chapter 2. For the purposes of this research, multiliteracies is defined as the multiple communication practices and forms beyond print that are tied to the availability and convergence of new technologies (Mills, 2010). Multiliteracy accounts for the influence of culture, society, and technology and includes the ability to

make meaning through any sign-making practices including wikis, blogs, databases, webquests, interactive digital art and electronic magazines.

Theoretical Approach

In order to understand first year teachers' use and perceptions of technology in literacy instruction, it is important to consider the issue through the lens of adult learning, as a significant portion of teachers' mastery of the practice develops in the first year of employment (Feiman-Nemser, 2003). The act of learning to teach, and more specifically, learning to teach literacy with technology, can be situated in the constructivist paradigm, as constructivism posits that knowledge is socially constructed through experience (Merriam, Caffarella & Baumgartner, 2007).

Constructivism asserts that learning is an active process of meaning-making that is shaped by sociocultural context (Merriam & Bierema, 2014). In the constructivist paradigm multiple realities exist, as there are many ways to obtain the same knowledge through different social constructions. Furthermore, the constructivist position believes that knowledge cannot be discovered or found, but rather built and able to evolve throughout the learning process.

Situated learning is a theory of learning within the constructivist orientation that is often used within the field of education. Situated learning theory has two central components (Lave & Wenger, 1991). The first element is the presence of a community of practice in which beliefs and behaviors are acquired in authentic contexts through social interaction and collaboration. In a community of practice, the learner develops knowledge through socialization, visualization, and imitation within a group of experienced individuals who share a craft, profession, or interest. However, communities

of practice require more than just technical skill to complete a task. Rather, communities of practice are organized around a particular area of knowledge and give members a sense of collaboration and identity. In the field of education, communities of practice are established during student teaching experiences within teacher preparation programs as well as among colleagues within a school.

The second critical piece of situated learning theory is legitimate peripheral participation during which the learner is given tasks on the periphery of the community of practice and, through experience, gradually increases responsibility and skill until he/she becomes an expert (Lave & Wenger, 1991). It is important to note that legitimate peripheral participation is more than just experiential learning, or learning by doing. Instead, legitimate peripheral participation positions individuals as full participants in the world and generators of meaning. For preservice teachers, legitimate peripheral participation most often occurs during practicum experiences.

To Merriam, Caffarella, and Baumgartner (2007), situated learning is for everyday living, including professional practice. Interaction with community, combined with technology, language, imagery and the activity at hand create both a physical and a social experience that is central to the situated learning process.

As this study focused on the perceptions and attitudes of first year teachers as they came to understand teaching literacy with technology through their own experiences within new careers, constructivism and situated learning were evident in their meaning-making.

Research Approach

To examine how one group of first year teachers describe their teacher preparation and use of digital technology to teach literacy in the classroom as well as how they describe the perceived obstacles and benefits of doing so, I conducted a qualitative instrumental case study of seven first-year educators from one school district. Data were collected in the form of one-time semi-structured interviews, technology asset matrices, and a one-time focus group. The data were analyzed using Lincoln and Guba's (1985) constant comparative method, and themes were identified.

For this study, purposeful homogeneous sampling was used to identify seven first-year teachers from the school district in which I teach. While insider research was my intent, I did make sure to exclude all first year teachers from my own school as well as any teacher with whom I had a working or social relationship. All participants in the study were female and ranged in age from 23-45.

The Researcher

At the time of this study, I was employed as an elementary classroom teacher in the school district studied, thus positioning this inquiry as insider research. While the participants in this study were my colleagues, I was not in a position of power or influence over these first year teachers and I opted to interview teachers with whom I did not have a professional relationship.

Researcher Assumptions

I have spent the past ten years working as an elementary school teacher in the school district in which this study occurred. I have had my own experiences as both a first year teacher and as an educator attempting to teach literacy using technology. As a

result, I began this research with several assumptions. First, I assumed that teachers who did not have access to adequate equipment in their schools would not feel confident trying to teach literacy using technology. Second, I assumed that younger teachers would be more likely to try using technology to teach literacy because they were part of the digital native group. Third, I assumed that first-year teachers would like more and/or better access to technology in order to teach literacy. My final assumption was that first year teachers would believe their preservice training was useful in their current classroom in teaching literacy with technology.

Overview

This chapter provides background information regarding the need for research in the area of first year teachers' digital literacy instruction, information regarding the researcher and her assumptions, as well as the theoretical and research approaches used in the study. Chapter Two includes a literature review that focuses on multiliteracies, teacher technology preparation, situated learning theory, factors affecting technology implementation in schools, teacher self-efficacy, and self-efficacy theory. The third chapter describes the instrumental case study method and qualitative research approach used in this study as well as information about the study participants. In Chapter Four, methods of data analysis and findings are shared. Chapter Five discusses the findings of this research in relation to situated learning theory, theories of self-efficacy and the current practices of first year teacher induction in public elementary schools. The final chapter draws conclusions, addresses limitations of this study and provides recommendations for future research.

Definitions of Key Terminology

Digital Literacy: the literacy practices associated with multimedia technologies like computers, the internet, video games, email, cell phones and search engines (Knobel & Lankshear, 2006). Digital literacy is also the ability to learn, comprehend and interact with technology in a meaningful way by using and manipulating information in a nonlinear design (Pianfenetti, 2001).

Digital Natives: individuals born after 1984 who have grown up with digital technology, are comfortable with new technologies, and expect their own education to incorporate innovative technology (Prensky, 2001).

First Year Teacher: a classroom teacher in his/her first year of full-time employment in a school.

Multiliteracy: encompasses multiple communication practices and forms beyond print that are tied to the availability and convergence of new technologies (Mills, 2010).

Multimodality: a set of skills representative of a multiliterate individual and involves the ability to make meaning through various representational and communicational resources like image, gesture, sound, speech, writing, and music (Jewitt, 2008).

Self-Efficacy: what an individual believes he/she can accomplish using his/her existing skills in prospective situations (Bandura, 1982). It has also been considered a task-specific version of self-esteem.

Self-Efficacy for Technology Integration (SETI): teachers' self-efficacy beliefs toward technology integration.

Situated Learning Theory: a theory of learning that posits that knowledge is situated within authentic activities and contexts (Lave & Wenger, 1991).

Technology: the hardware, software, equipment, and tools that assist students and teachers in their tasks throughout the school day. This includes both core and complementary technology (Collis & Moonen, 2005) as well as digital and electronic tools.

Traditional Literacy: at the elementary school level, the ability to decode, comprehend, and produce information.

Chapter II: Literature Review

The potential factors influencing first year teachers' use of technology to teach literacy are extensive and diverse. This literature review focuses on three key areas that may influence first year teachers' use of technology to teach literacy, including the emphasis on multiliteracies, preservice preparation for technology use in the classroom, and barriers and pathways to technology implementation in schools. These potential factors are examined through the theoretical lenses of situated learning theory, and self-efficacy theory.

The literature consulted in this review include professional journals, books, and internet resources. Electronic sources were retrieved using ERIC, ProQuest, SAGE, and Google Scholar. Literature selected for this review met the following criteria:

- All literature was peer reviewed
- All literature relating to teacher preparation and the use of technology in the field of education was published in or after 2002, ensuring that the most current information was considered
- Literature published prior to 2004 was included only when discussing theories that provided the foundation upon which the research was built

Multiliteracies

Definitions and assumptions. In the past, traditional literacy has been conceptualized as a standard set of context-free skills that could be taught without regard for background, culture, or experience (Mills, 2010). In fact, many have viewed literacy solely as the ability to read and write (Pianfetti, 2001). However, with the advent of digital communication technologies, this universalist definition has been elaborated on in

order to take into account meanings that exist in modes other than printed words on paper. New understandings of literacy now incorporate any sign-making practices that use various technologies (Mills, 2010) including wikis, blogs, databases, webquests, electronic magazines, interactive digital art, and even video games. What used to be called "literacy" is now further broken down into a variety of subcategories, or multiliteracies, that account for the contextual influence of culture, experience, history, society, and technology. The birth of multiliteracies is a response to the technological revolution of modern life (Cervetti, Damico, & Pearson, 2006). In essence, technology has changed the way we communicate and now scholars are looking to understand how this digital shift influences the way we make meaning in technology-saturated communities.

There are many terms for this expanded view of literacy throughout the literature. Knobel and Lankshear (2006) use the term "digital literacy" to describe the literacy practices associated with multimedia technologies like computers, the internet, video games, email, cell phones and search engines. Pianfetti (2001) defines the same term in a different way, stating that digital literacy is the ability to learn, comprehend and interact with technology in a meaningful way by using and manipulating information in a nonlinear design.

New Literacy (Leu, Kinzer, Coiro, & Cammack, 2004) is an umbrella term that describes the ability to use information and communication technologies to develop the 21st century knowledge and skills that are essential for success in the workplace and in life. New Literacy includes technology literacy, information literacy, media literacy, global literacy, and social responsibility literacy (McPherson, Wang, Hsu, & Tsuei,

2007). The theoretical perspective of New Literacies posits that literacy learning is embedded in social, cultural and material contexts and developed in interactions within a community of learners who share a specific historically and socially constituted domain of knowledge (Leu, Kinzer, Coiro, & Cammack, 2004). The concept of design is a key element in the theory. In this framework, individuals are both the inheritors of language patterns and conventions of meaning while also being active designers of meaning. In this way literacy educators and learners are engaged participants in social change that develops from successful interaction across multiple languages, multiple Englishes, and communication patterns that cross cultural, community, and national boundaries (Leu et al., 2004).

Multimodality is a set of skills representative of a multiliterate individual and involves the ability to make meaning through various representational and communicational resources like image, gesture, sound, speech, writing, and music (Jewitt, 2008). Multimodality, as a social semiotic theory, focuses on meaning as it is culturally and social constructed. While there may be multiple definitions surrounding the concept of constructing meaning through technology, there is a set of shared assumptions that is common throughout the research of multimodality in the field of education (Ajayi, 2011). The first is that access to multiple modes allows students more varied and multidimensional entry points to reading. Second, using multiple modes allows for multiple meanings, thus implicitly rejecting the belief that there can be a single interpretation of a text. Third, all texts can be remade through reader interpretation. The fourth assumption is that literacy is socially situated, which means that interpretation and

appropriation of text will vary among social groups. Finally, literacy practices vary across cultures and contexts.

Critical Theory. Within these assumptions is the underlying acknowledgement that literacy is an ever-expanding set of socially situated practices that are ideologically charged and linked to social, cultural, economic, and historical factors (Cervetti et al., 2006). These beliefs are grounded in critical theory and support the philosophical stance that the exploration of literacy cannot be undertaken without examining issues of power and marginalization. (Sheridan-Thomas, 2007).

In fact, Mills (2010) argues that literacy practices are ideological and are framed by social contexts and power relations. Mills' notes in her comprehensive review of literature in the field that all literacy practices, including multiliteracies, exhibit patterns of marginalization that are socially and historically founded. That is, literacy practices are primarily understood as constructions of specific social groups whose values and history influence their creation and dissemination. This idea is supported by Mills' finding that while digital literacies are continuing to increase in Western cultures, they remain unevenly distributed across communities as socioeconomic marginalization is tied to reduced quality of access to digital practices.

Though digital literacy theorists acknowledge that the introduction of computers in literacy education has reproduced socioeconomic patterns of marginalization that are related to the appropriation of digital practices (Mills, 2010), there is hope that multiliteracies, specifically digital literacy, will become a tool for participating in democracy, promoting social justice, and engaging in global economic networks (Sheridan-Thomas, 2007).

The need for multiliteracies in schools. As these new modes of communication may potentially be used as vehicles to prepare young adults to be citizens, workers, and change agents in a diverse world, there is a need to embrace multiliteracies in schools (Sheridan-Thomas, 2007). Multiliteracies challenge the present design of traditional schooling and the dominant models of literacy most often taught in classrooms by viewing learning as a process of design, diversity, multiplicity and choice of representation, awarding greater power to the learner (Kalantzis & Cope, 2012). While experts in the field may agree that multiliteracies are a positive addition to the field of education, and school systems encourage adopting new literacies, there is little evidence that multiliteracies are present in schools. And if new literacies are present, they are often unequally distributed (Mills, 2007).

In fact, Mills' (2007) critical ethnography of an Australian elementary school classroom found that schools systems often fail to provide equal access to multiple literacies despite the efforts and intentions of educators. In her ethnography, Mills collected observational data from a year six classroom (students aged 10-12 years) in a suburban state school in Queensland, Australia. The school was situated in a low-income area with students representing 25 different nationalities. Mills collected data from 36 hours of classroom observation in the forms of continuous audio-visual recording, field notes, and cultural artifacts, which were analyzed using low and high inference coding and then triangulated with comparative dialogical data in order to include the participant perspective. From this information Mills found that students had varying degrees of access to multiliteracies that depended on their association with dominant culture. This

access was influenced by individuals (students, teachers, principal) as well as the economic, cultural, and political structures of the school and the greater community. Mills discovered that inequitable practices like ability grouping created stratified levels of reading and writing that, while claiming to attend to individual differences, actually "fell along the historical grids of social class, ethnicity, and gender (p. 12)."

Mills' (2007) study demonstrates that while multiliteracies evolved from a critical theory perspective as a way to address inequity in literacy practices, issues of power, marginalization, and hegemony still exist in the delivery of multiliteracies in schools. Kitson, Fletcher, and Kearney (2007) acknowledge that multiliteracies in schools are often not equitable, but that school districts and organizations are taking steps to mitigate this issue.

In their ethnographic action research, Kitson, Fletcher, and Kearney (2007) investigated how a single elementary school teacher in Queensland, Australia used an interactive whiteboard to teach multiliterate practices when reading multi-modal texts. This research was a collaboration between the teacher and the researchers in order for the researchers to understand the teacher's espoused and enacted beliefs as to what counts as multiliteracies in her classroom. Data were collected in the form of documents, videotapes of classroom interaction, teacher planning materials, work samples, artifacts, and interviews with the classroom teacher. The data were analyzed in two rounds. The first round of data analysis sought to determine what counted as multiliteracy and how it was demonstrated, while the second round examined how teacher beliefs framed the use of interactive whiteboards to teach literacy. Kitson, Fletcher, and Kearney found that while the teacher had a strong understanding of multiliteracies and was able to clearly

express her espoused beliefs on the importance of multiliteracies in school, her actual practice did not reflect her opinion and understanding of the concept. Instead, the researchers found that while the teacher did use a variety of technological devices, multimedia, and multimodal texts, her teaching practices remained focused on a print-based approach.

Both Mills' (2007) and Kitson, Fletcher, and Kearney's (2007) research demonstrate the gaps that schools and teachers face as they begin to change their understanding of literacy to include forms of meaning beyond print on paper. Even a shift in philosophy doesn't guarantee that a change in practice will happen as quickly, and teachers' beliefs about their equitable practice may not always be reflected in their instruction. Furthermore, as both studies showed, inequity, power dynamics, marginalization, and hegemony can remain and be perpetuated in school environments that promote multiliterate practices.

Preparing teachers for multiliteracies. The concept of multiliteracies challenges the current organization of American schools as it questions the prevalence of dominant, print models of literacy that continue to be taught in a digitalized society (Jewitt, 2008). One of the greatest challenges facing schools is how to prepare educators for schools as they currently exist while also trying to anticipate the future of instructional environments (Cervetti et al., 2006). Recent research has looked for the presence of multimodality and multiliteracies in schools, but as this field is relatively new, most studies are small, case-based, descriptive work (Jewitt, 2008).

Ajayi's 2011 study of preservice teachers' knowledge, attitude, and perception of preparedness to teach multiliteracies found that teacher candidates understood the

importance of digital literacy but didn't feel prepared to teach it for a variety of reasons, including inadequate resources in schools and a lack of understanding of the role of the teacher. Using a population of participants that reflected the demographics of the southern California county in which the research was conducted, Ajayi collected qualitative and quantitative responses from a survey designed for this particular study. Interview responses were analyzed based on the framework of discursive practice and coded according to expressed themes. Quantitative data were analyzed using SPSS software to determine descriptive statistics and reliability analysis. From this work Ajayi determined that the critical issue amongst the preservice teacher population was how their training built on both existing knowledge and the awareness of the importance of new literacies in literacy instruction. These findings demonstrate that before multiliteracies are present in schools, they must be present in the instructional repertoire of our emerging teachers.

Cervetti, Damico, and Pearson's (2006) review of existing literature on new literacies and teacher education lay out a frame work of the five digital literacy functions an educator must demonstrate in order to be successful. These functions are identifying important questions, navigating complex information networks to locate information, critically evaluating the information, synthesizing information, and communicating answers to others. Using these functions as outcomes, the authors recommend that teacher preparation programs help future educators understand their own multiple literacies before exposing these preservice teachers to the multimodalities used regularly and fluently by today's students. Additionally, Cervetti et al. suggest that universities establish apprenticeship programs with schools that are already enacting a multiliteracy

curriculum. Though these recommendations are helpful, they do bring up the chicken or the egg scenario. How can preparation programs provide their student teachers with digitally literate cooperating classrooms, when we have yet to explicitly train mentor teachers in this field?

Roswell, Kosnick, and Beck's (2008) three-year longitudinal study of a teacher preparation program at the University of Toronto also found shortcomings regarding the nature and impact of teacher education programs designed to teach multiliteracies. The researchers followed ten literacy instructors and twenty-two graduates of the program, who volunteered to participate over a three-year period. Qualitative data were collected biannually through observations and interviews. Transcripts were analyzed and coded for themes, which were modified throughout the data analysis process. From their research, Roswell, Kosnick, and Beck found that while there was evidence of important advances in the field, preservice teachers still lacked clarity about the nature of multiliteracies pedagogy, did not explore a broad enough range of literacies, and did not pay explicit attention to inclusion of all cultures or critique ideology. The authors attributed these findings to the ambitious reform objectives of multiliteracies, the lack of understanding and skill of teacher educators, and the use of curriculum that provides one-shot assignments to address pedagogy rather than weaving new literacies throughout the entire program.

Similarly, Wake and Wittingham (2013) used a quantitative, survey-based design to examine how exposure to various digital technologies used to support multiliteracies influenced preservice teachers' familiarity and intent to use the technologies in their own practice. The researchers used 57 participants who were teacher candidates in a Master

of Arts Teaching program at one university. Data were collected in the form of surveys. The first survey was administered early in the semester. Participants were then presented with a project assignment that required the teacher candidates to choose one of the listed technologies used to support multiliteracies and then research and present their choices. A final post-survey was administered at the end of the semester after all of the presentations had been completed. The results of the study indicated that while preservice teachers self-reported an increase in knowledge for most of the technologies available to support multiliteracies from the beginning of the semester to the end, the participants' were more cautious and less confident about their abilities to use these technologies in their own classrooms at the end of the semester. The authors speculate that the lower level of confidence could be due to the participants' realization at the end of the semester that they weren't as knowledgeable as they had previously thought.

Similar to the previous studies, Rosaen and Terpstra (2012) found that preservice teachers could identify the importance of a new literacies curriculum but weren't able to successfully implement these skills. The authors developed a collaborative self-study to help preservice teachers expand their understanding of literacy and their ability to incorporate new literacies pedagogy into their teaching. The researchers, who were also professors, used the students enrolled in their co-taught course as the subjects of their study. Rosaen and Terpstra justified the use of self-study in this instance because the design promoted learning that was embedded within the experience of teaching while also providing an opportunity to contribute to a growing research program committed to the self-examination of practice. The researchers analyzed students' written work produced in the course to understand students' changing concept of literacy throughout

the semester and their abilities to apply their learning to language arts instruction. This analysis was conducted by coding specific assignments to look for changes over time, examining student lesson plans for evidence of application, and reviewing instructor artifacts and records. Rosaen and Terpstra determined that by the end of the semester, the participants in the study broadened their conception of literacy and were able to discuss implications in classroom teaching but were unable to fully integrate technology and new literacies in their own self-designed lessons. This highlights one of the major themes within the literature, which is that teacher candidates understand the importance of incorporating digital literacy and multimodality into their teaching but do not feel prepared to do so.

These studies indicate that preservice teachers are aware of the importance of including multiliteracies instruction in their repertoire and can identify the value in expanding current literacy curriculum to include multimodal texts that are socially and culturally equitable. However, the research is demonstrating that preservice teachers are struggling to integrate multiliteracies into their developing practice, which could result in first year teachers entering the classroom feeling unprepared to teach with multimodal texts.

Preparing Teachers Through Technology Training

This feeling of unpreparedness from preservice teachers is not limited to the field of digital literacy. Technology across the curriculum is an area of concern for teacher candidates, the colleges preparing them, and the school sites in which they will eventually be employed. This review has found that not all teachers are equipped with the same skills, that teacher candidates use technology in their own lives but do not

transfer these skills to academic or professional environments, and that there is a need for change at the university level in order to address these issues.

Disparities in technology training. While U.S. teacher preparation programs are required to provide instruction on technology integration (Kleiner, Thomas, Lewis & Greene, 2007), there are different requirements, formats, and approaches at every university. Some programs offer specific courses on technology skills and education either as single classes or a tiered set of required modules throughout the program, others infuse methods courses with applied technological practices, while still others couple technology integration with field experiences (Gronseth, Brush, Ottenbreit-Leftwich, Strycker, Abaci, Easterling, Roman, Shin, & Van Leusen, 2010).

Gronseth et al. (2010) conducted an investigation that looked into the types and content of technology experiences that are offered by American teacher preparation programs. The authors examined the differences that existed among all four-year, initial-licensure teacher preparation programs in the United States in order to identify faculty perceptions of technology experiences and the topics used to prepare teachers to use technology in schools. Their study found that while all teacher education programs in the United States provided instruction on technology integration, some variability existed in how it was addressed as some institutions required stand alone educational technology courses while others counted on integration-focused field experiences or methods courses. With such a broad variety of ways to fulfill the national requirement, it is not clear how successful each is in preparing teachers to use technology in the classroom.

If technology training can vary so greatly between institutions, one could assume that the technological experiences of pre-service teachers would also differ as well. As

all licensed teachers are required to fulfill the same National Education Technology Standards for Teachers, there is cause for concern if educators are all receiving different tools to accomplish a uniform goal. Susan Sutton (2011) used this assumption as the rationale for her instrumental case study. Sutton's study identified and analyzed the pre-service technology training experiences of novice teachers using 20 participants who had graduated from a college of education and had one to three years of classroom experience. The author's intent was to provide an in depth description of a particular context rather than to generalize the results of the study to a greater population, thus justifying the information-rich, case study approach. Using semi-structured interviews, document analysis and reflective field notes, Sutton simultaneously gathered and analyzed the data. From the identified codes and themes, the author found a disconnect between preservice teachers' technology training and the other aspects of their teacher education. Specifically, participants shared that there was an emphasis on technology use in their technology course but not in their theory and methods courses, making it difficult for participants to see the connection between technology and content. Furthermore, the participants noted inconsistency between the lack of technology integration by the faculty members in their teacher preparation program and the ways the participants were expected to use technology in their own teaching.

As Sutton (2011) found, part of the disconnect or discrepancy may be attributed to the faculty at these institutions. Tondeur, van Braak, Sang, Voogt, Fisser, and Ottenbreit-Leftwich's (2012) meta-ethnographic review of qualitative studies found that while there is a greater presence of technology in teacher preparation programs, there is little modeling of appropriate uses by teaching faculty. This finding demonstrates that there is

an awareness of the need to further integrate technology into teacher education programs on the part of university faculty, but personal practices in research and instruction have not caught up. This creates a void for preservice teachers who are also aware of the importance of technology in their practice, but unable to access modeling of these skills.

Martinovic and Zhang (2012) had similar findings in their exploratory case study of preservice teachers' expectations of and attitudes toward the use of technology in their teacher education programs. The researchers ran their exploratory case study over the course of two years. The study was conducted at a single mid-size Canadian university with 23 preservice teachers participating in the first year, and 64 participants in the second year. Data were collected in a sequential mixed-method approach that began with a quantitative survey and was followed with a focus group. The participants reported inadequate or scarce modeling of technology integration in their teacher education programs and student teaching as well as limited access to technology during their coursework. Like Tondeur, van Braak, Sang, Voogt, Fisser, and Ottenbreit-Leftwich (2012), Martinovic and Zhang (2012) found a void in modeling and demonstrating technology by faculty in teacher education programs.

Situated Learning Theory and teacher education. Korthagen (2010) attributes this void to curriculum design in teacher education programs that emphasizes theory first and only introduces practice once abstract knowledge is acquired. If preservice teachers are learning about technological tools and the benefits of digital literacy without simultaneous exposure to these devices in real classroom settings, then following Korthagen's argument one can assume the formal instruction in teacher education programs won't stick. Korthagen argues that this design, which is followed by many

traditional programs in the U.S., is detrimental because preservice teacher learning does not simply result from absorbing educational theories or increasingly complex learning concepts. Rather, Korthagen posits that learning is part of the process of participation in social practice, particularly the social practice in school settings beyond the university classroom.

Korthagen's (2010) position is supported by the Situated Learning Theory of Jean Lave and Etienne Wenger (1991). Lave and Wenger argue that knowledge is acquired in context rather than the abstract, using tools as practitioners use them in order to become cognitive apprentices of that discipline's community and culture. In fact, advocates of situated learning believe learning is for everyday living, including professional practice, and only happens when people interact with the history, cultural values, and assumptions of a community. From this theoretical perspective, this interaction with community, combined with technology, language, imagery and the activity at hand create both a physical and a social experience that is central to the learning process (Merriam, Caffarella & Baumgartner, 2007).

While many teacher education programs encourage the active engagement, discussion, evaluation, reflection and collaboration that the Situated Learning view recommends (Bell, Maeng, & Binns, 2013), content is still often delivered in packages of information organized by instructors (Vincini, 2003). Situated Learning proponents would argue that for preservice teachers to successfully acquire educational technology skills they require instruction presented through complex problem-solving scenarios during which the instructor gradually moves from delivering structured presentations to modeling and coaching through contextual real-life problems. From there, preservice

teachers should be introduced to communities of practice in functioning school environments where they will appropriate the norms, routines, and skill sets of experienced teachers over time (Korthagen, 2010).

Bell, Maeng, and Binns (2013) explored the efficacy of a teacher preparation program informed by situated learning theory. The researchers used a qualitative case study approach to examine how preservice science teachers used technology in reform-based instruction within a teacher education program supported by situated learning theory. Bell, Maeng, and Binns followed 26 preservice teachers from two cohorts in a Master of Teaching program at an American university. Data were collected in the form of field notes from observed lessons, participants' lesson plans, interviews, reflections, and artifacts. The results of the study found that situating technology instruction within social, authentic contexts was successful in facilitating preservice teachers' use of technology. Bell, Maeng, and Binns found that participants were able to effectively transfer what they had learned and practiced in their teacher education coursework into their student teaching. This research suggests that the instructional design of technology requirements in teacher education programs should align with the situated learning paradigm to include more opportunities for practice in authentic contexts.

Technological Pedagogical Content Knowledge (TPACK). Based on the identified need for technology to be connected to content and actual practice, Koehler and Mishra (2009) developed the concept of Technological Pedagogical Content Knowledge (TPACK). TPACK is a framework that highlights the importance of preparing preservice teachers to make informed decisions in their uses of technology when teaching specific content areas to specific groups of students.

Koehler and Mishra (2009) posit that there are three main components of teachers' knowledge: content, pedagogy, and technology, and that these three components interact to create pedagogical content knowledge, technological content knowledge, technological pedagogical knowledge, and technological pedagogical content knowledge. TPACK, therefore, is the simultaneous interaction of all three components as well as the ability to tailor instruction using technology in order to meet the needs of students. TPACK operates under the assumption that technology integration is not derived from one specific pedagogical orientation, but rather includes a range of methods to teaching and learning (Tondeur, van Braak, Sang, Voogt, Fisser, Ottenbreit-Leftwich, 2012).

Digital natives in a professional world. While research in the field has developed models like TPACK to address the shortcomings of instructional design, teacher education faculty, and teacher preparation programs in general, it is important to note that current research is also focused on other factors influencing the implementation of technology in education. An entire stratum within the field is presently examining how young adults who have grown up in an electronic era are having difficulty transferring their technological skills to academia and the work place.

The term digital native (Prensky, 2001) has been created to define the group of people born after 1984 who have grown up with digital technology, are comfortable with new technologies, and expect their own education to incorporate innovative technology (Kumar & Vigil, 2011). By this definition, students in the classroom as well as preservice and newer inservice teachers are considered digital natives. However, research has shown that digital natives, while confident in their use of technology for

purposes like social media, have limited to no transfer of these skills to academic or professional environments.

Lei's (2009) survey-design study examined the attitudes, beliefs, and technological expertise of digital natives who are also preservice teachers. Lei surveyed the entire 2007 freshman class within the teacher education program at an American university. The survey asked about general technology use, attitudes and beliefs toward technology, proficiency in specific common technologies, experiences with these technologies and opinions on technology use in the classroom. Lei's survey found that while preservice teachers had strong positive beliefs regarding technology, they had reserved attitude about integrating technology in the classroom. Additionally Lei found that participants were proficient with social-networking technology but lacked experience and expertise with classroom technologies. Lei's study demonstrates while that digital native preservice teachers use technology extensively, it is primarily isolated for personal use.

Similarly, Kumar and Vigil's (2011) research found that digital natives are not adequately prepared to teach with technology. The researchers used a quantitative survey-design with 54 undergraduates enrolled in a college of education at a private university. The survey asked participants about their use of Web 2.0 tools and creation of online content for personal and educational purposes. Like Lei, Kumar and Vigil found that preservice teachers reported a high use of social-networking technology, however participants were less familiar with Web 2.0 technology like wikis, blogs, podcasts, social bookmarking tools, and multi-user virtual environments and also less likely to use these platforms in their teaching.

Guo, Dobson, and Petrina's (2008) research supports both Lei's (2009) and Kumar and Vigil's (2011) studies. The researchers studied the effects of age on technology competency in student teachers using a mixed-method, multi-site design. Guo, Dobson, and Petrina (2008) conducted their research over eight years with student teachers enrolled in one-year post-baccalaureate teacher education programs at three universities. Two of the universities were in Canada and one was in the United States. Data were collected in pre- and post- surveys as well as through classroom observations. The study found no statistical difference in technology competence scores between digital natives and digital immigrants; individuals born prior to 1984 who did not grow up with technology. Guo, Dobson, and Petrina's work demonstrates that just simply being born in an era of rapid technological growth and development isn't enough to guarantee technological competence.

The work of Lei (2009), Kumar and Vigil (2011), and Guo, Dobson, and Petrina (2008) all show that preservice and new teachers who are also digital natives, despite being born and educated during a time of accelerated technological progress, are not using technology to the degree expected. These digital natives are most comfortable with social networking technology, often do not integrate educational technology into their practice, and aren't exhibiting greater technological competence than their older colleagues.

Technology Implementation in Schools

Current literature in educational technology and schools shows an increased availability and presence of technology in classrooms, but also reveals that teachers are often not integrating it into their practice (Barone & Wright, 2008). According to Barone

and Wright, two thirds of educators feel underprepared to use technology in their teaching. Studies have looked to identify the factors contributing to this phenomenon and have identified two major areas of interest: external and internal influences.

External factors. There are many challenges that serve as barriers to teachers' integration of technology in the classroom (Barone & Wright, 2008). Extrinsic factors are the simplest to identify in the existing literature, as they can be easily labeled and quantified. The largest external issue remains resources. Teachers may not have access to state-of-the art technology, many may not have time, or may lack technical support.

Another contributing aspect is school leadership, as superintendents and principals may not provide adequate planning or scheduling, or even the funding necessary to bring technology into the buildings (Barone & Wright, 2008). Further impairing the situation is the pressure of assessments. If student achievement in technology is not being measured, it often becomes less of a priority than those subjects that are tested.

Some studies have suggested that a lack of adequate professional development is the primary reason that teachers are not integrating technology into their instruction (Hutchison & Reinking, 2011). However there has yet to be any empirical evidence demonstrating what approach or content should be delivered during professional development to address this gap.

Internal factors. Upon examining the many external factors contributing to the lack of technology integration in schools, one could easily assume that these issues are the largest barriers teachers face. However, even if all external impediments are removed, teachers are still not automatically moving to technology in their practices

(Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012). Internal issues like teacher confidence, perspective, and self-efficacy also influence technology integration (Ajayi, 2011). In fact, Wang, Ertmer, & Newby (2004) suggest that teachers' self-efficacy beliefs regarding computer use are one of the most significant factors in the implementation of technology in the classroom.

Lack of technological self-efficacy has also been found in preservice teachers who are not yet working in the classroom (Ajayi, 2011). In their qualitative study of the behavior of preservice teachers as it relates to technology, Williams, Foulger and Wetzel (2009) examined the implementation of a collaborative technology project into the teacher education course. Using data from focus groups formed through maximum variation sampling, the information was analyzed using qualitative analysis software that generated codes and themes that were then triangulated with other data sources including surveys and reflections. The researchers found that preservice teachers lacked self-assurance and awareness of confidence-building experiences with technology but indicated their confidence was strengthened by the usefulness of the technology tools assigned for the project as well as by peer collaboration. This suggests that, while self-confidence with technology may be a factor in a teacher's technology integration, in-depth instruction and opportunities to use these devices in real-world applications can help teachers overcome their implementation issues.

In another study focused on the internal factors of technology implementation, King (2002) researched how educational technology courses could transform teachers' perspectives on and confidence with technology. The researcher used a phenomenological approach along with transformative learning theory as a lens through

which to examine the educational technology professional development of 175 teachers and teachers-in-training over a three year period. The study found perspective transformation in the participants as evidenced by changes in teaching methods, changes in teacher preparation and research methods, and increased self-confidence with technology use. King's research illuminates the power that internal factors, like perspective, have over teachers' behaviors, actions, and sense of self-efficacy.

Self-Efficacy Theory

According to Albert Bandura (1982), self-efficacy is what an individual believes he/she can accomplish using his/her existing skills in prospective situations. It has also been considered a task-specific version of self-esteem (Wang, Ertmer, & Newby, 2004). Bandura's Self-Efficacy Theory presumes that individuals are more likely to participate in activities for which they have high confidences in their abilities to achieve, thus often only attempting to learn or perform tasks that they believe will be successful. In short, performance and motivation are at least partially determined by how effective people believe they can be (Bandura, 1982).

Bandura (1982) believes there are four sources of information that individuals use to determine their efficacy: performance outcomes, vicarious experiences, verbal persuasion, and emotional arousal. These domains aid people in determining if they believe they have the capability to accomplish specific tasks. Performance outcomes, or past experiences, are the primary source of self-efficacy. If an individual has done well on a task previously, he/she is more likely to attempt and do well on a similar task in the future. If an individual has done poorly, he/she is less likely to attempt a similar activity

again. Self-efficacy can also be gained vicariously through the observation of others' performances.

Bandura's (1982) self-efficacy theory has been applied to computers and technology, and more specifically to teachers' use of technology in schools. The idea is that the higher a teacher's self-efficacy beliefs toward technology integration (SETI), the more likely he/she will be to use technology in his/her instruction (Lee & Lee, 2014). According to Lee and Lee, in preservice and novice teachers SETI has a direct impact on their actual use in the classroom. The following studies by Chen (2010) and Wang, Ertmer, and Newby (2004) demonstrate how self-efficacy influences technology integration in preservice and new teachers.

Self-efficacy and technology. Rong-Ji Chen's (2010) study of self-efficacy addressed limitations of previous studies on factors related to teachers' integration of technology. Chen attempted to test a structural equation model of the relationships among variables that influence preservice teachers' technology use. The researcher developed a questionnaire to measure the variables of use, training, value, efficacy and context within the structural equation model using both published and researcher-developed instruments. With a sample of 206 preservice educators from one university in the United States, the researcher gathered data and statistically analyzed it using structural equation modeling in order to account for latent variables that are not directly observable. The study found that intrinsic factors like perceived efficacy of teaching and learning with technology were the strongest determinants of technology use in the classroom. Though the study may be biased in its use of convenience sampling, it contributed valuable information to the field as it addressed two major gaps commonly found throughout the literature. It

sought to clearly define teachers' use of technology, and also distinguished between the intrinsic and extrinsic factors influencing implementation.

Wang, Ertmer, and Newby (2004), acknowledging that self-efficacy is a determinant in the implementation of technology in schools, sought out ways to support intrinsic beliefs in this field. The authors designed a study to examine the impact of vicarious learning experiences and goal setting on preservice teachers' SETI. Using a 2 x 2 mixed factorial research design to create four experimental conditions, the researchers selected a sample of 280 participants who were enrolled in an introductory technology course at one university. Wang, Ertmer and Newby designed a Likert scale survey to use with the experimental situations. The Likert scale measured participants' SETI using 21 questions regarding participants' confidence for technology use. Quantitative data were analyzed for descriptive statistics and statistical significance using two-way ANOVA. Qualitative data were analyzed for patterns and themes. From this information the authors found that preservice teachers who were exposed to vicarious learning experiences and were assigned specific goals experienced feelings of greater SETI than those individuals who received only one of the two conditions, or neither treatment at all. This confirms findings from previous research that preservice teachers benefit from vicarious learning experiences like observing exemplary veteran teachers but also provides new insight into how activities like observations and goal-setting can improve preservice teachers' SETI.

The authors make clear that self-efficacy can be influential in technology integration, and is most successful when supported by actions such as vicarious learning and goal setting. Furthermore, Wang, Ertmer, and Newby's (2004) findings demonstrate

the importance of providing teachers with opportunities to observe exemplary technology use and explicitly linking class objectives and learning goals to support goal setting.

Summary

Meaningful research has been conducted on the technologization of school literacies and pedagogy (Jewitt, 2008) as well as preservice teachers' technology training and implementation (Tondeur et al., 2012). Although there is a lack of literature at the intersection of these two topics, both fields acknowledge the importance of establishing a teaching population that is able to advance and adapt as quickly as our technology is changing.

The discipline of multiliteracies is ever evolving, all encompassing, and reflective of social and cultural contexts (Kalantzis & Cope, 2012). Multimodality, new literacy, digital literacy and multiliteracies share the desire to equip students with the abilities to comprehend and make meaning using a variety of expressions that are not limited to the printed word on the paper page (Mills, 2010). While this field also recognizes the importance of bringing multiliteracies to schools by adequately preparing new teachers to expand their practices to include Web 2.0 skills (Kalantzis & Cope, 2012), the literature shows that this is not consistently occurring. More research needs to be done to determine the presence of multiliteracies in schools and the components needed for successful integration.

Similarly, the domain of technology training for preservice teachers highlights the presence of technology requirements at all four-year teacher preparation programs in the U.S (Kleiner, Thomas, Lewis & Greene, 2007), yet simultaneously exposes the disparities within the curricula (Gronseth et al., 2010) and among the faculty (Tondeur et

al., 2012) thus creating unequal learning experiences for teacher candidates. Major contributors in the field call for more thorough instruction in the university classroom, more technologically qualified faculty and more technology use in practicum experiences, particularly for digital natives, who have had the technological exposure throughout their own education but are still not applying their social technology skills to academic or professional environments.

Both external and internal factors influencing preservice teachers' technology implementation exist (Barone & Wright, 2008). While external factors seem the most obvious, intrinsic issues, like self-efficacy beliefs, appear to significantly influence application and implementation (Ajayi, 2011). More research into small-scale solutions at the university level as well as systemic and conceptual changes within the discipline is needed.

As multiliteracies become more prevalent and commonplace in schools, it will likely force the technology integration of teachers to match pace. As this occurs, greater attention will be paid to how preservice teachers are trained to teach digital literacy in American schools, resulting in a much-needed body of literature that is not yet developed.

Chapter III: Methodology

Introduction

This study sought to examine how one group of first year teachers described their teacher preparation and use of digital technology to teach literacy in the classroom. It also explored how these first year teachers described the perceived obstacles and benefits of teaching literacy with technology. In order to investigate this topic, a qualitative, instrumental case study approach was used.

Qualitative Research Approach

The qualitative approach was best suited for this research question as qualitative research tends to address research problems that require an exploration in which little is known about the problem in that setting and a detailed understanding of a central phenomenon is needed (Creswell, 2007). Since the intersection of digital literacy instruction, digital literacy training in licensure programs and teachers' sense of self efficacy in teaching literacy with technology has recently been brought to the forefront of the field (Teo, &Koh, 2010), this approach allowed me to better understand the issues and experiences at hand directly from the participants. Furthermore, a qualitative investigation allowed me to investigate the multiple issues that exist within this juncture at the local level.

Instrumental Case Study Approach

Within the domain of qualitative research, the instrumental case study approach was an appropriate method to examine first year teachers' descriptions of their digital literacy training and their perceptions of their own self-efficacy in teaching literacy with technology in the classroom. A case study is an in-depth exploration of a bounded

system (Creswell, 2008). In this study, the case was bound by its brief duration over two months during the 2014-2015 school year as well as by the singular school district in which all participants were employed. This school district is situated in a large, suburban New England community that is socioeconomically and culturally diverse. The school district houses nine elementary schools, three middle schools, and one high school. There are roughly 8,000 students and 300 full time classroom teachers at the elementary level. During the 2014-2015 school year 68 new teachers were hired in the elementary schools.

According to Stake (1995) an instrumental case study seeks to offer insight into a specific issue, reframe generalizations, or generate theory. The case facilitates the understanding of a particular issue or phenomenon. The instrumental case study design was appropriate for this research because the case provided insight into the greater national issue of teacher preparation in the subject of digital literacy. Data were collected in the form of interviews, asset matrices, and a focus group in order to understand participants' perspectives on their digital literacy training in their teacher education programs, their current practices in the classroom, and their senses of self-efficacy in teaching with technology.

Strengths. The case study approach was particularly appropriate for this research question because it could provide a rich and holistic account of what teachers were experiencing in their training and their senses of self-efficacy once they entered the classroom. This account, as it was anchored in a real-life situation, could offer insight and illuminate meaning that had the potential to structure future research. Furthermore, the case study approach has been found to be a strong and useful approach in examining

innovations, like technology, within applied fields of study, particularly education (Reis, 2013).

Limitations. While the strengths of the case study focus on the holistic understanding of a bounded case or phenomenon, limitations to this approach do exist. As the single instrumental case study focuses on one unit or instance, the approach lacks generalizability (Creswell, 2007). Though qualitative research is not meant to produce generalizable findings, readers of a case study may gain insight into the particular phenomenon studied and use what they have learned in another setting or context (Reis, 2013). This study may complement current research being conducted on this topic worldwide by confirming and illuminating the findings of others, together revealing a trustworthy phenomenon. Therefore, while the knowledge gained from this case study may not be generalizable, it may be transferable (Creswell, 2007). In order to insure transferability, I have provided thick, rich description of the case.

Another limitation of case studies involves the subjectivity of the approach and the biases of the researcher. The case study approach relies on the investigator's inferences and personal interpretations of the data (Reis, 2013**)**. If only one researcher is collecting data and analyzing the case, the results may be more easily influenced by the investigator's personal interests and beliefs (Reis, 2013). This creates issues of credibility and dependability. I have attempted to address these limitations by being reflexive and self-disclosing about my position in the study, by triangulating my data sources and methods, and doing member checking with my participants (Creswell, 2007). From the member checking, I found that I did not need to change my findings as the participants confirmed these statements to be an accurate reflection of their perspectives.

Epistemological position. Although there are issues with generalizability and subjectivity in this approach, from a social constructivist perspective the case study method was an appropriate choice for this research because it relies predominantly on the participants' views of the situation, while also generating meanings that are multiple and variable (Creswell, 2007). Social constructivism as a theoretical framework assumes that reality is established through human activity and does not exist prior to its social creation (Ultanir, 2012). In this paradigm, learning is a social process and knowledge is a human product, individually created and influenced by social exchanges and culture. The social constructivist epistemology believes participants construct meaning of a situation through discussions and interactions with others (Merriam, Caffarella, & Baumgartner, 2007), which occurred as the subjects participated in interviews with the researcher during the data collection phase of the study.

In this paradigm, my role as the researcher was to listen carefully to what the participants said in their life setting, consider context in order to understand historical and cultural influences, and finally interpret the meanings that the participants had about the world (Creswell, 2007). I had to position myself in the investigation to acknowledge how my own personal, cultural, and historical experiences influenced my interpretation of participants' experiences.

Some may argue that the social constructivist perspective largely ignores objective measures, does not advocate for action to support individuals, and does not give enough weight to the outcomes of research (Creswell, 2007). However, for the purposes of this study, which sought to learn more about how new teachers describe their own experiences, the social constructivist paradigm appropriately informed this research.

Sampling

This is a large suburban school district with 8 elementary schools and 68 new hires in 2014-2015 at the elementary level. Prior to sampling, I decided to exclude any new teachers from my building or with whom I work directly, and to refrain from identifying participant names, the grades in which they taught, or the schools in which they worked in order to protect participants' anonymity.

Purposeful, homogeneous sampling (Creswell, 2008) was conducted in order to gain access to seven first-year elementary school teachers from the school district in which I teach. I first had to seek approval from the Community Resource Development Committee to conduct research in the school district in which I teach. Once my application was accepted and with the help of the literacy coach in my school, I emailed the seven literacy coaches at the other elementary schools asking for the names of all first year teachers in their buildings. All seven literacy coaches responded to my emails, and I received the names of sixteen first year teachers.

I emailed all sixteen prospective participants with an explanation of the study, the consent form (see Appendix A), and an invitation to participate. Fourteen prospective participants responded to my email. One individual was not interested in participating in the study, and six prospective participants were disqualified because they were not classroom teachers or were not in their first year of teaching. Seven first-year elementary classroom teachers agreed to be interviewed. After the interviews, all seven participants verbally agreed to participate in the focus group. However, when I emailed the invitation to participate in the focus group, only four of the seven participants responded. Four teachers participated in the focus group.

Participants. All participants in the study were female, ranging in age from 23-45. All were teaching in Kindergarten through fifth grade. I did not identify participant names, the grades in which they taught, or the schools in which they worked in order to protect participants' anonymity.

Allison. Allison is a White female. She is a grade 3-5 teacher in her early twenties. She received her teaching certification from an undergraduate program at a public university. Allison is currently enrolled in a master's program.

Elizabeth. Elizabeth is a White female. She teaches in a 3-5 classroom. Elizabeth is in her late twenties and received her teaching degree from a master's program at a private university.

Jessica. Jessica is a White female in her mid-forties and received her teaching certification from a post-baccalaureate program at a public university. Jessica teaches in a 3-5 classroom.

Katherine. Katherine is a White female. She teaches in a K-2 classroom. She is in her early twenties. Katherine completed her teacher preparation program in undergraduate coursework from a public university. Katherine is currently enrolled in a master's program.

Melissa. Melissa also teaches in a K-2 classroom. She is a White female. Melissa received her teacher certification from a master's program at a private institution. She is in her early twenties.

Rebecca. Rebecca is a Hispanic female in her early twenties. She teaches in a 3-5 classroom. Rebecca received her teaching degree in an undergraduate program from a public university.

Samantha. Samantha is a White female in her mid-thirties. Samantha completed her teacher preparation requirements in an undergraduate program at a private university. She teaches in a K-2 classroom.

Relational and ethical issues of insider research. Insider research, such as studying teachers within my own school district, can be considered problematic because some believe it does not conform to standards of intellectual rigor since insider researchers have a personal stake and emotional investment in the setting (Brannick & Coghlan, 2007). Critics like Anderson and Herr (1999) see insiders as being too close to the situation and thus unable to attain the distance and objectivity necessary for valid research.

Though there may be concerns regarding insider research, I chose to conduct research using my own school district to address sampling issues of access, intrusiveness, familiarity and rapport. First, I believed that first year teachers would be more likely to agree to participate in my study because I was associated with the school district. Mercer (2007) agrees, stating that access is more easily granted in insider research and participants are more likely to respond to an individual with whom they have an established connection. Second, insider research can alleviate issues of intrusiveness. I believed teachers might be less likely to invite an outsider into their classroom, even after school hours, whereas there is an established culture of collegiality already in place within my district in which teachers are welcome to visit each other. As an insider, I believed I had a better chance of gaining access to teachers' classroom environments in my own district. Third, as an insider I could begin the study with a strong initial understanding of the social setting of the district, the context, the potentially subtle links

between situations and events, and the implications of following specific paths of inquiry (Mercer, 2007). Finally, by using participants from my own district I was able to quickly establish credibility and rapport with the subjects, which may have generated a greater level of candor than would otherwise be the case. This belief is supported by Mercer (2007) who posits that insider research can foster greater confidence between the parties, resulting in the disclosure of intimate details that are best understood by individuals familiar with the full complexity of the context at hand. Furthermore, Edwards (2002) argues that the establishment of trust and rapport is crucial to the success of case-study research.

Design

My research was conducted in a three-step process, beginning with one-time, semi-structured one-on-one interviews. At the end of the interview a short asset matrix was given to participants to fill out. Following the interviews, a focus group was held with four participants.

Instrumentation and data collection. An interview protocol (see Appendix B) was developed using methodology from Robert Weiss' (1994) *Learning with Strangers: The Art and Method of Qualitative Interview Studies,* Ruthellen Josselson's (2013) *Interviewing for Qualitative Inquiry*, and Irving Seidman's (2005) *Interviewing as Qualitative Research*. Clarifying and elaborating probes were also prepared. The protocol was pre-tested with two first year teachers who were not participating in the study. Face to face interviews were conducted and digitally recorded after obtaining signed consent from each participant. The digital recordings were saved in password-protected files and later transcribed by an independent third party. The interview

transcripts were also saved in password-protected files. Reflective field notes were taken during and after each interview to capture ideas, concerns, and emerging patterns. Participant names or identifying information were omitted from the field notes.

The purpose of the interviews was to understand the lived experiences of first year teachers during their teacher training and actual practice in the classroom as well as to gain an understanding of the meaning the participants were making of their experiences with technology. The further aim of the interview process was to document participants' self-understanding and working models of the educational world in which they exist (Josselson, 2013).

The interview protocol contained questions regarding the technology requirements during preservice teacher training, including "Were there any technology requirements specific to your literacy courses?" and follow up probes that specified training during coursework and student teaching assignments. The protocol also had questions regarding teachers' current use of technology in the classroom. One such question was, "What kinds of technology do you use and how do you and your students use it?" Follow up questions asked about the reasoning behind teachers' technological choices as well as the benefits and limitations they perceived from using technology to teach literacy in the classroom. Finally, the protocol included questions about teachers' sense of self-confidence in using technology to teach literacy. One such question asked teachers to identify the factors affecting how they felt about their own self-efficacy, asking, "What factors do you think might be affecting how you feel?"

At the end of the interviews I asked participants to fill out a written asset matrix (see Appendix C). The asset matrix was used to triangulate data gathered from the

interviews and focus group. The asset matrix was adapted from McClay and Mackey's (2006) *Asset Model of Contemporary Literacy Experiences* and Wake and Whittingham's (2013) *Technology Usage to Support Literacy Survey*. The written matrices did not ask for participants' names or any identifying information and were stored in a locked file cabinet, separate from any identifying information.

A preliminary focus group protocol (see appendix D) was developed using methodology from David Morgan's (1997) *Focus Groups as Qualitative Research.* The protocol was adapted after the interviews were conducted, as the purpose of the focus group was determined by the prior participant interviews. The protocol was pre-tested with a group of three first year teachers who did not participate in the formal study. The focus group was video recorded in order to identify when different individuals were speaking. The focus group video file was transcribed by an independent third party. The video file and its transcript were saved in a password protected file. Reflective field notes were also taken during and after the focus group. Participant names or identifying information were not recorded in the field notes.

The purpose of the focus group was to provide greater depth and detail to the data collected during the individual interviews (Morgan, 1997). Furthermore, the addition of the focus group allowed me to triangulate the data I had collected from the interviews and asset matrices, while also providing an opportunity to gather another layer of detail and insight on the subject that was exposed through group interaction.

The focus group protocol included many of the same questions asked in the individual interview protocol as a way to get participants to expand on their previous answers in the form of a conversation with their colleagues. Fewer prompts were

developed and one additional question regarding the frequency of technology use in literacy instruction was added.

Data Analysis

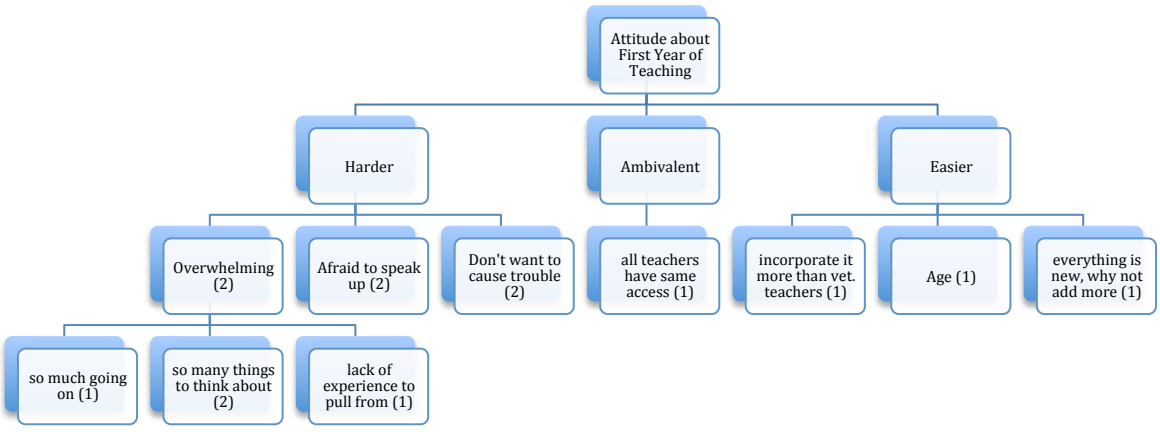
I analyzed the qualitative data using the constant comparative method (Glaser & Strauss, 1967; Lincoln & Guba, 1985). The constant comparative method was developed for use in the grounded theory methodology, but is also used in other qualitative approaches as an analytical strategy that is generally descriptive or interpretive in its understanding of human phenomena within specific contexts (Grove, 1998). The constant comparative method of data analysis is an inductive process in which the researcher critically examines data to gather or generate new meaning (Baxter & Jack, 2008). As such, the constant comparative method is an appropriate method of data analysis for this instrumental case study because the purpose of this research was to gain insight into the greater issue of teacher preparation in the subject of digital literacy.

The constant comparative method uses the act of comparing in a series of cyclical steps to determine conceptual similarities, refine categories, and discover patterns (Boeije, 2002). The process focuses on the activities of fragmenting and connecting. Fragmenting emphasizes the separate themes that emerge during an interview and relies on an individual ordering process based on the research question. Fragmenting isolates the coded pieces of data from the context of the interview. In contrast, connecting emphasizes the context of the data and interprets the interview pieces as a whole. Both processes are necessary to maintain balance and equilibrium in the investigation.

I used Boeije's (2002) steps for conducting constant comparative analysis with qualitative interviews to inform my process. I began my first round of analysis using In

Vivo coding as a way to prioritize the participants' voices and focus on the significance of the first year teachers' words. I used In Vivo coding with all seven interview transcripts. After preliminary coding of all transcripts, I conducted comparisons within one interview transcript using open thematic coding to fragment the data. Fragments with the same code were compared to determine if new information was given or the same information is repeated. Fragments were then compared to look for commonalities, differences, and the context in which the remarks were made. This internal comparison was conducted to conceptualize the core message of the interview using the codes. The open coding process resulted in a summary of each interview, a code tree comprised of provisional codes, and my own memos describing the analysis process. See figure 1 for an example of one of the code trees developed during this process that focused on educators' attitudes regarding their first year of teaching.

Figure 1: Code Tree for Attitude about First Year of Teaching



Once internal comparisons were made within each new interview, I compared interviews within the case. I used axial coding to search for indicators and characteristics that could describe a concept and also to look for combinations of codes that could produce patterns or clusters. By examining the similarities and differences between the interviews I was able to extend the code tree to the point of saturation and identify themes that recurred in all seven interviews. After analyzing the interviews, I conducted the focus group and used the same coding and analysis process. Once the focus group analysis was complete, I returned to the interviews to look for new insights that were produced during the focus group.

After all comparisons were made and I determined that the categories were saturated, regularities among the dominant themes had emerged, and no new information was added to the understanding of the phenomenon, I shared my reconstruction of the data with the participants. I emailed participants the transcripts of their individual interviews and the focus group. I used member-checking to make sure that my understanding of their experiences was a reasonable reconstruction of the participants' reality (Grove, 1988).

To qualitatively analyze the technology asset matrices I began by noting which types of technology the participants said they used in the interview and compared their verbal answers to the technological items they checked off on the matrix. I looked to see if participants marked off the items on the matrix that they spoke about during the interview. I then looked to see if they added any additional technological items that they did not mention in the interview. Finally I compared the technological items used in literacy instruction to the technological items used in other areas of the school day. Once

I had analyzed each matrix individually, I gathered the set of matrices as a group to examine the frequency of responses for each technological tool and to look for similarities and differences between the participants' responses.

Validity and applicability. The constant comparison method (Lincoln & Guba, 1985) can demonstrate external validity and applicability when the sampling procedure has been conducted in a homogeneous group as this presents a solid basis for generalizing the concepts and the relations between the sample to individuals who were absent from the sample, but who represent the same phenomenon (Boeije, 2002). The sample for this case study was homogeneous in that all individuals were in their first year of teaching elementary school within the same school district.

To insure that the findings of this study could be transferred between the researcher and the participants, a thick, rich description of the case was included. Using a thick, rich description allows readers to transfer information to other settings and determine whether the findings can be applied to other situations (Creswell, 2007).

The use of member checking also established validity in this case study, as member checking allowed the participants to confirm the credibility of their accounts and narratives (Creswell, 2007). Each participant was provided with a copy of the transcript of her interview and a copy of the focus group transcript if she also participated. I asked participants if their words accurately reflected their intentions and what they had said during our time together.

Reliability. Reliability was established in the coding process by digitally recording all interviews and having a third party check to make sure that the transcripts accurately matched the participants' actual words. I developed a consistent intra-coding

process that was documented in my memos throughout the data analysis process, providing a clear record and audit trail of my decisions.

Believability. According to Bachor (2002), believability can be achieved in case studies through a series of steps that are designed to improve reporting guidelines and thus help the readers better interpret the study. To achieve believability a study must contain a clear communication of results, a clear explanation of how the case was developed, and enough material for the reader to extend, connect, or apply the case to his/her own context. I followed Bachor's steps to make sure that this case study had a clear explanation of both the development and results of the research, and enough information to allow the reader to interpret the study.

Summary

A qualitative, instrumental case study was employed to understand how first year teachers describe their teacher preparation and use of technology to teach. This case study was bound by the singular school district in which the research was conducted and in which I also work as a classroom teacher. Insider research was used to address sampling issues of access, intrusiveness, familiarity and rapport. Purposeful homogeneous sampling provided seven first-year teachers willing to participate. Participant information was kept confidential and any identifying information was omitted from the study.

Data were collected in a three-step process, beginning with one-time, one-on-one semi-structured interviews. At the conclusion of each interview, a technology asset matrix was completed by each participant. Finally, a focus group was held with four of the seven initial participants. Data were analyzed using the constant comparative method

(Lincoln & Guba, 1985). Three iterations of coding were performed on the interview and focus group transcripts. From these codes, themes were derived and then combined into central findings. The technology asset matrices were qualitatively analyzed and compared to participant comments in the interviews. Steps were taken to insure validity, applicability, reliability and believability. The following chapter will discuss the three major findings derived from this methodology.

Chapter IV: Findings

Introduction

The purpose of this research study was to determine how first year teachers describe their teacher preparation and use of technology to teach literacy by considering how teachers' descriptions demonstrate self-efficacy, identify challenges and obstacles, and distinguish benefits of technology integration in literacy instruction. Based on the data collection and analysis, this case study generated the following major findings:

- First year teachers feel unprepared by the literacy courses and student teaching assignments within their teacher preparation programs to teach literacy using technology.
- First year teachers are using some aspects of technology to teach literacy, like district-provided laptops and student-centered software, but are able to identify barriers, including access to equipment and equipment failure, that are keeping these teachers from using technology to teach literacy as frequently as they desire.
- Most first year teachers identify as confident in their ability to teach literacy with technology. However, it is the unique circumstances of the first year of teaching that have created feelings of being overwhelmed that, in turn, have limited the ways and frequency of technology use during literacy instruction.

Bounded Case

This case study was bound by its brief duration as well as by the singular school district in which all participants were employed. Data were collected over the course of two months during the 2014-2015 school year in a large, suburban New England school district. This school district serves approximately 8,000 students in nine elementary

schools, three middle schools, and one high school. There are approximately 300 full time elementary teachers employed by this district, with 68 new hires in 2014-2015 at the elementary level.

Table 1: Participant Pseudonyms and Grade Levels Taught

Participant Pseudonym	Grade Level Taught	Age
Allison	3-5	Early twenties
Elizabeth	3-5	Late twenties
Jessica	3-5	Mid forties
Katherine	K-2	Early twenties
Melissa	K-2	Early twenties
Rebecca	3-5	Early twenties
Samantha	K-2	Mid thirties

Participants

Seven first year teachers from four of the nine elementary schools agreed to participate in this study. The participants were given pseudonyms to protect their identities. In the interest of confidentiality, the participants' exact ages or grade levels were also kept confidential.

Process

The study was conducted in a three-step process, beginning with one-time, one-on-one, semi-structured interviews. At the conclusion of each interview, participants were given a technology asset matrix to fill out that asked individuals to identify the types of technology they used in literacy instruction, in other areas of the school day, and in their personal lives. One month later, a focus group of four participants was held.

The data, in the form of participant responses, were analyzed using the constant comparative method (Lincoln & Guba, 1985). In Vivo coding was used in the first iteration of analysis, followed by a round of open coding and a final round of axial

coding. All coding was done by hand. The asset matrix was qualitatively analyzed to triangulate the data. As a result of the research conducted, three major findings were discovered and are presented below.

First year teachers feel unprepared by their teacher preparation programs to teach literacy using technology

All seven participants repeatedly expressed that they felt unprepared by their teacher preparation programs to teach literacy using technology. In the interview protocol teacher preparation programs were defined and broken down into two categories specific to the research question: literacy courses and student teaching.

Literacy courses. Participants shared that technology was rarely taught in the context of literacy during their teacher preparation programs. Six out of seven participants did not have a technology component in their literacy courses. These six participants came from all three of the teacher preparation programs represented in the sample. Only one participant, Samantha, had a technology and literacy course, but believed it was not helpful. She expressed frustration that the course did not provide practice with a variety of technological tools and shared that the course felt outdated. Samantha said:

> It was really so irrelevant, but we made PowerPoints and things like that – a lot of PowerPoints. We made a PowerPoint game, we made a PowerPoint story, we had to rewrite a fairy tale and put it online, but just in PowerPoint. It was basically a PowerPoint class.

All participants expressed a desire for more thorough training in their coursework. Individually, several participants including Rebecca and Elizabeth shared their wish for

more comprehensive technological training in their literacy coursework. Rebecca said, "I wish there was a lot more with literacy…I used it a lot for math. Mainly math…but I wish they [teacher preparation program instructors] introduced more technology with literacy." Elizabeth had similar thoughts, stating, "I do think it would be helpful [to have technology integrated into literacy courses] to definitely have something within the program." This sentiment was reiterated during the focus group, during which all four focus-group participants agreed that they would welcome more opportunities to use technology in their literacy coursework. Katherine summarized the sentiment of the focus group conversation by saying:

> Our prior experiences in college didn't really prepare us anyways so I think if I went through a college that was technologically based and said, 'use all this' and then I went into my first year, I'd be like, 'all right!'

Student teaching. While most did not believe their literacy courses contained technology components, five out of seven participants did identify at least one technology requirement within their student teaching. These requirements varied, and included incorporating both student and teacher technology use in lesson plans and fulfilling requirements from the state's Department of Elementary and Secondary Education's Pre-service Performance Assessment (PPA).

Many participants did note that the requirements were minimal. Elizabeth shared, "Some people could do it [fufill the PPA] in one day…you could just do one lesson, technically. There's no major requirements for [specific teacher preparation program]." Allison added, " There were not technology requirements [in student teaching] at all. It was just, like, an added bonus if I did." As Allison stated, many of the first-year teacher

participants noted that they went beyond what was required of them in terms of using technology during student teaching. Even with minimal to no requirements, four out of seven participants reported using technology in their student teaching on a daily basis.

Most participants had positive experiences using technology in their student teaching. Of those, many attributed the benefit to existing conditions in their cooperating schools. Two participants spoke directly about the influence of technologically savvy cooperating teachers, who were already implementing technology in the classroom long before their student teachers arrived. Samantha talked about how technology was a natural part of the school day in her cooperating teacher's classroom. Samantha said:

> It just happened organically. My supervising practitioner had just won a grant for one-to-one iPads using—it was actually only for math, was the grant, but we incorporated literacy a lot…In my student teaching I was really fortunate to have that training on the spot.

Elizabeth also discussed the advantages of having a technologically adept supervising practitioner. Elizabeth shared:

> But luckily…I was exposed [to technology] because I had great mentor teachers. They exposed me to a lot of the things, like the document camera, how to use them, what's the best way to you know [teach], to make sure your kids have a piece of paper in front of them but also one [projected] up on the board and, you know, those kinds of things.

Two other participants attributed their success in implementing technology within their literacy lessons in their student teaching sites to equipment that was available in their cooperating classrooms. These participants did note that their student teaching sites

had more technological equipment than the current classrooms in which they work. Rebecca simply stated, " A lot of stuff I did during my undergrad [student teaching] I really can't do here." Melissa shared specifically about the Smart Boards in her cooperating classroom:

> Where I did my student teaching was at the [name of practicum placement] school and they had Smart Boards in several of the classrooms, so that was really just a key part of the teaching every day from my cooperating teacher. And then when I would do my lessons, I would use it for almost everything: literacy, math, whatever I was teaching…I used it almost daily during my full time student teaching.

Other participants who completed their student teaching in different locations shared that they believed the lack of equipment in their student teaching placements was a disservice to their training. Jessica shared her frustration during the focus group, adding, " I was over at [name of practicum placement] and basically there was one computer in the classroom. We had an overhead projector and that was it." Katherine agreed, stating: "The teachers had laptops but our kids didn't have computers in the room. There's no Smart Boards so it was a difficult to implement that [technology] in my student teaching."

While the majority of participants believed that there were more opportunities to learn and practice technology in their student teaching than in their literacy coursework, all of the first year teachers agreed that they felt unprepared by their teacher preparation programs to teach literacy using technology. They expressed a desire for more training at the university level and increased opportunities for practice in their coursework.

The findings from this study regarding teacher preparation programs are supported by earlier research (Agyei & Voogt, 20011; Drent & Meelissen, 2008; Liu, 2012) that found that teacher education courses often fail to help with technology integration in the classroom. However, these studies also found, as the results of this study similarly demonstrate, that practicum experiences and competent mentor teachers or supervising practitioners can influence preservice and first year teachers' technology integration.

First year teachers use some technology to teach literacy, but also identify barriers to further use.

The first year teachers all shared that they were using some aspects of technology in their literacy instruction, but were also able to distinguish obstacles that were keeping them from using technology to teach literacy as often as they wished.

Actual use. All seven participants identified features of technology that they used on a regular basis in their current classrooms during literacy instruction. This information was shared during the interviews and focus group, but was also triangulated by the technology asset matrices that were filled out after the interviews were completed. The technology asset matrices provided participants with a list of 32 technological tools, devices, software, and apps. Participants were asked to note if they knew of each item, used it in their personal lives, used it in school teach literacy, and/or used it in school outside of literacy.

Participants said that they were using technology in literacy instruction to model decoding strategies, practice phonics skills, conduct interactive read alouds, demonstrate note-taking skills and online research techniques, and draft writing with students. Six of

the seven participants shared that they also have a weekly computer lab time during which they assign students to use reading software, applications, and websites independently.

The participants' responses combined with the results of the asset matrices demonstrated that first year teachers are indeed employing technology in their literacy instruction. While the majority of this use appears to be teacher-led demonstrations or practice, first year teachers are also using technology in student-centered literacy activities.

Table 2: Participants' Actual Classroom Use of Technological Tools

Technological Tools	Number of Participants Using the Tool in the Classroom
District-issued laptop computers	**7 of 7**
Raz-Kids (interactive e-books)	**6 of 7**
District-issued desktop computers	**5 of 7**
Document cameras	**5 of 7**
Word-processing software	**5 of 7**
Online magazines	**5 of 7**
PowerPoint	**3 of 7**
Lexia (reading intervention software)	**2 of 7**
Online video resources	**2 of 7**

District provided equipment. To teach literacy with technology, the participants reported using a variety of district-provided equipment, software, applications, websites, and personal devices brought from home. All participants said that they used district-issued laptop computers in their literacy instruction. Five of the seven participants stated that they also used district-issued desktop computers, document cameras, and word processing software. Six participants reported having students practice literacy skills using the interactive e-book program, Raz-Kids, two participants used the Lexia reading program with their students, and five participants used online magazines with their

classes. Two participants mentioned using the online video resources Discovery Ed and BrainPOP, three participants reported using PowerPoint, and five participants used online magazines. The first year teachers in this study used some, but not all, of the technological equipment provided or offered by the school district.

Personal devices used in the classroom. Two participants also mentioned that they brought their own technological devices from home into the classroom in order to integrate technology into their literacy instruction. These first year teachers provided students with their personal iPads, Kindles, and laptops. Allison shared that she wanted opportunities for students to use technology independently or in small groups while she was working with other students, which she couldn't do unless she brought her own devices from home, stating, "I have two tablets and two laptops in my classroom that I bought…And I just give them out to kids…I have bought a second iPad for the purpose of my classroom." Similarly, Elizabeth spoke of bringing in her own iPad to record students reading because she didn't have access to any recording equipment in her school. Elizabeth said:

> I brought in my own iPad to…record the students reading and then have them listen to themselves. I do it a lot with fluency…that's helpful for them to hear themselves read and make comments about themselves and how they're doing.

Because some forms of technology, like tablets, are not available through the school district, first year teachers are bringing their own devices from home for students to use.

Self-directed integration. Just as some first year teachers are bringing their own technological equipment to school, three of the seven of the participants expressed that it was also their responsibility to determine how or if to integrate technology into not just

their literacy instruction, but all aspects of the school day. These participants shared that any lesson for which they were using technology was self-developed. They stated that there were no technological requirements or expectations from the administration regarding the integration of technology into the literacy curriculum. Allison explained, "No one was handing me the technology. I had to come up with it on my own…That's [lesson plans] my own. There's no curriculum or preparation." Allison also shared the frustration of her independence in using technology in her classroom; "I have to go out on my own and see what's on the internet and download apps that don't work, pay money for [apps]…and I have to go through three before I get one that does what I need it to do."

Frequency of use. Six out of seven participants reported using technology in their literacy instruction approximately once a week. Only one participant stated that she used technology daily in her literacy teaching. The first year teachers reported that during the school day they used technology more frequently in other subjects than in literacy instruction, though this may change as the Common Core State Standards (CCSS) are adopted, since the CCSS will include research related reading and writing.

Barriers to use. All seven first-year teachers identified obstacles that kept them from using technology as much as they would like. Access to equipment, equipment failure, lack of experience, lack of time, lack of administrative support, physical space limitation and lack of funding were identified as barriers. Access to equipment, equipment failure, and lack of experience or training were the most frequently identified issues.

Table 3: Participants' Perceived Barriers to Technology Use in School

Participants' Perceived Barriers	Number of Participants Citing the Barrier
Access to equipment	6 of 7
Equipment failure	5 of 7
Lack of experience/training	4 of 7
Physical space	3 of 7
Lack of time	2 of 7
Lack of support from administration	2 of 7

Limited access. Six of the seven participants cited limited access to equipment as a central obstacle to technology integration in literacy instruction. Access issues included lack of equipment or devices in the schools, restricted use of the shared computer lab due to scheduling, and reserving laptop carts that are shared throughout the school.

Katherine expressed her frustration with the lack of equipment at her school, saying, "Sometimes if I go on and look for ideas or lessons, a lot of times it will require having certain technology that we don't have. So I don't end up getting to teach that lesson." Elizabeth discussed the limitations she experienced in trying to do a specific activity because she could not reserve the laptop cart shared throughout the school. She stated, "We can't really do [particular assignment] here because we have only those 25 [shared laptops], which are never guaranteed, depending on the timeframe…Some teachers check them out for weeks at a time at a certain block so you never get to use them."

Jessica and Melissa both spoke about not having computers to use in their classrooms. Jessica said:

> The infrastructure's just not here to do some of the things that I think would be good to do…There's just not the computers available to have them [students] do

> their own work online or research things online. So I think it's really—we're just—we're sort of limited with the technology right now.

Similarly, Melissa shared her experience saying, "I don't have a computer in here [her classroom]. Some classes do have these things, some classes don't and I'm just a class that doesn't." Many of the teachers reported that they needed to visit the school's computer lab in order to use technology. Some of the participants expressed their frustration in sharing the computer lab with the other classrooms in the building, as the need to share space limited the frequency and length of time that students could access technological equipment. Katherine stated, "We only have media [computer lab] for 45 minutes one day a week, so the kids actually using the computers doesn't happen so often."

Equipment failure. Five of the seven participants identified equipment failure as an obstacle in teaching literacy with technology. According to the participants, equipment failure changed how a lesson was delivered and could also negatively impact behavior management. Elizabeth shared a scenario she said she had experienced repeatedly:

> When the technology's not working and you have a lesson planned and you want to implement something that needs to be on the board…and all of a sudden, it's not working and you're like [to the students], alright…you're going to stay here for two minutes and Mrs. McDougal is going to sit here [with you] and I'm going to run and make some copies because this is not working. I mean, that's what ends up happening.

During the focus group, Melissa also commented on the struggle of maintaining order during equipment failure. Melissa shared, "Sometimes it [technology] just doesn't work, and so then you spend the time trying to fix it and the kids are going everywhere."

The participants also shared the negative impact that equipment failure had on their already constrained teaching time. Katherine offered, " When technology fails and doesn't work, it takes a long time to recover from it, which wastes a lot of time—which is unfortunate, because we don't have enough time as it is." In her interview Melissa described a lesson that could not be executed because too much time was spent trying to fix the equipment:

> The projector wasn't working and I spent the lesson time trying to fix it and doing that whole thing, like messing with it…It was a distraction and detracting from the lesson and their [the students'] learning time…It becomes more about fixing the technology and calibrating and figuring out how it works rather than using it to supplement the curriculum.

Allison spoke about the added time it takes to change plans on the fly when the equipment in her classroom is malfunctioning. Allison said, "Our projector dies frequently now…and the laptop doesn't work unless it's plugged in…so then I have to pull out my [personal] Kindles and the iPads. So that stinks. It just kind of adds more work for me." Likewise, Samantha offered, "We are encouraged to use that [technology] here but it's just been very difficult to get it to work…It's almost been like a burden to get it working and to get it up."

Lack of training and support. Four of the seven participants cited a lack of training and support from the school district as a barrier to their use of technology in

literacy instruction. Participants spoke of a lack of training on existing equipment within school buildings. Katherine recounted, "We just got Chromebooks for the school and we haven't had the opportunity [to use them] because we were supposed to have a meeting on how to use them and haven't been able to do that." Allison stated, "Our school's laptop cart sits in my room because no one else knows how to use them."

Participants also brought up the need for support in navigating through new equipment and software, as they shared they were not likely to seek out new programs or tools independently. During the focus group, Katherine and Jessica discussed their desire for guidance in the use of new technological equipment or applications.

> Katherine: I would probably use it [technology] …if someone would say, this would be good for this or you can use it for this, things like that. The last thing on my mind is oh, well I'm going to take out that computer and try to figure out how to use it on my own for the next hour when obviously no one has the time for that…Until you show me how to do it and what it does, then I'm probably not going to do it. I need somebody to say to me, open this up, this is what it does, this is how you can work it… and then I'd feel at least a little better.
>
> Jessica: I think if I had more training myself I would use it more. There's a learning curve for me.
>
> Katherine: I think definitely [we need] more training but the hard part is going into training knowing that we don't have the tools to use, it's like you sit there and think this would be so great if we had it [the technology].

> Jessica: I know I'd be able to learn whatever I needed to learn to do it if there was someone there to say, look, here are the specific programs or the specific websites that would really be effective—if somebody could kind of suss [sic] that out for me—I know that I'd be able to learn it. But I would definitely need somebody to show me. I don't even know where to look really. I would need coaching.

Both Katherine and Jessica shared that they wished for more opportunities for training, and believed coaching or instruction in how to best use equipment and software would increase their personal usage in the classroom.

The barriers acknowledged by the participants in this study are consistent with the perceived extrinsic barriers identified by prior research (An & Reigeluth, 2011; Ertmer, 1999; Kopcha, 2012). These particular barriers, known as first order barriers (Ertmer, 1999), are the obstacles considered external to the teacher, such as lack of resources, institution, and assessment. Access to technology, or lack thereof, was found to be the most common barrier in this research, and is also one of the most prevalent barriers in previous studies (Clark, 2006; Lim & Khine, 2006). Other external barriers common in recent research are professional development and training (Hinson, LaPrairie, & Heroman, 2006; Mouza, 2009; Wells, 2007) and time (Al-Senaidi, Lin, & Poirot, 2009; Lim & Khine, 2006), which were both barriers perceived by the participants in this study.

Participants felt confident to teach literacy with technology.

Most first year teachers expressed self-efficacy in their abilities to teach literacy with technology regardless of their self-described level of training or current technology use in the classroom. Many of the participants attributed their confidence to being digital natives. However, the unique circumstances of the first year of teaching created a feeling

of being overwhelmed in the participants that was limiting the frequency of and ways in which technology was used during literacy instruction.

Self-efficacy. Five of the seven participants expressed high levels of self-efficacy in using technology to teach literacy regardless of how often they were actually doing so. Katherine related her own high level of technological confidence in the classroom to her own personal technological practices when she shared:

> When it comes to technology, I am in my comfort zone… I'm confident only because I use enough technology outside of school to know that if I had to, I could bring it into my classroom and I'm confident in learning to use it. I feel like I'm pretty quick with learning technology only because I can relate it to different kinds of things that I already use.

Samantha expressed the most extreme level of confidence of all of the participants but self-reported the least frequent use in the classroom both in the interview and in the technology asset matrix. Samantha acknowledged this dichotomy, saying, "I feel super confident in doing it [teaching literacy with technology]. If I used it more, or had the ability to use it more, I know that I could do it and I know the right things to do and the benefits of using it….I feel super confident about it."

Conversely, Allison, who self-reported the most frequent technology use in the classroom in both the interview and the technology asset matrix, was one of two participants to share that she had a low level of self-efficacy when it came to teaching literacy with technology. Allison related her lower level of confidence to her lack of experience in the classroom, stating, "I don't know how confident I feel about teaching

literacy with technology. Relying on pure technology? I don't do that, so I guess I don't feel confident about that. I mean, probably not enough years' experience, I guess."

Digital natives. Four of the five participants who believed that they had high levels of self-efficacy in teaching literacy with technology attributed their confidence to growing up as digital natives with technology at home and at school. These four individuals fit Prensky's (2001) definition of digital native, in that they were all born after 1984 and used technology in their own educations prior to their professions. Melissa shared:

> I feel confident just because I grew up with a computer and I was lucky enough to go to a high school where we had laptops and we were given them for the year. We were able to use them for homework and bring them back and forth. So I'm just very used to using technology in the school. For me technology has always been incorporated into my experiences with school both as a student and as a teacher….I do feel prepared, but I think it came from just being a generation that always used technology so I kind of came with an understanding already.

Katherine and Rebecca both discussed their confidence as digital natives in comparison to older, veteran teachers. Katherine said:

> I'd say I'm pretty confident with it [technology] only because I am a little bit younger so I have a little bit more experience than people who are retiring this year and haven't used it as much…When it comes to technology I'm in my comfort zone. I have an iPad, an iPhone—Apple products are kind of my thing."

Similarly, Rebecca shared, "I would feel very confident [using technology], actually. I grew up using technology, so I'm confident in using it…I try to incorporate technology a lot more than veteran teachers I've seen."

Teacher attitude. Most of the first year teachers believed teaching literacy with technology was a positive component of education and beneficial for teachers and students alike.

Teacher benefits. Three of the first year teachers discussed the personal benefits they found in teaching literacy with technology. Elizabeth said, "It makes my job a little easier. Instead of having to reteach kids, [I can] leave the instructions typed up on the board, or leave the article on the board so that the kids can then not have a million questions." Allison also spoke about how using technology made her job easier. She offered, "I just think it's quicker [for me]. It saves time and it's easier." In contrast, Katherine spoke of the benefits she found for her own personal education. Katherine said, "It [teaching literacy with technology] allows me to learn about things. Every time I go online I find something else I can do. It's beneficial for me because it's allowing me to learn a little bit more about how to use it here [in the classroom]."

Student benefits. Five of the seven participants believed that students benefited from the integration of technology into the literacy curriculum. The first year teachers thought teaching literacy with technology provided more diverse accommodations for students serviced through special education, offered alternate methods of accessing information, and prepared students for the digital world.

All five participants who discussed the advantages of technology integration in literacy instruction mentioned increased student engagement as a primary benefit.

Melissa said, “It [technology] provides a switch and it’s just more engaging and interesting.” Similarly, Allison contributed, “I think kids are more engaged by it [technology] and it mixes things up.” Katherine shared, “It [technology] allows them [students] to participate more. It’s more of hands-on versus just listening to me talk or giving questions and answers. It allows them to actually be participating.”

Drawbacks. Two participants, who were also the two oldest teachers in the sample, did not believe that technology was always appropriate or beneficial for students or teachers. Jessica and Samantha both spoke about situations in which they believed technology did not enhance or elevate the quality of instruction. Jessica offered:

> I don’t necessarily think that it [technology] always adds to the teaching that’s going on in the classroom. I don’t know. Sometimes paper and pencil works just as well…I don’t know that that’s the best way to teach. I don’t know that it’s the most efficient use of time, energy, money. I think it can be a distraction sometimes.

Samantha wondered if too much screen time diminished the value of elementary education:

> I mean, do they need to be looking at a screen to get teaching points? I think it does help in terms of buy-in…, but at the same time, it doesn’t have to be there. We can still learn and still teach without it, especially because they [students] are only [age]…I don’t think it’s necessary.

Two first year teachers, Melissa and Katherine, believed technology was beneficial but also expressed concern regarding student or teacher dependence.

Katherine worried that her students would lose writing skills with too much technology integration, saying:

> If it gets used too much…they're kind of losing out on the writing part of it [learning]. Especially in [grade level] that's obviously important because their writing isn't all that great. So they lose out on the handwriting piece and the writing on the lines."

Melissa also considered over-dependence, saying:

> I think you also could run into the danger of becoming really dependent on it. I mean, even just thinking of my student teaching, like a lot of it involved that Smart Board and I'm thinking if that Smart Board ever went out, who knows what those kids would have done because they were so used to using that Smart Board as a staple of their learning.

The first year dynamic. Six of the seven participants described the first year of teaching as difficult and overwhelming, and believed the unique circumstances of the first year of teaching influenced their use of technology to teach literacy. Participants described the first year of teaching as challenging and expressed the struggle to balance the demands of learning new content and new methods of instruction while aiming to please their principals. They shared that technology integration was not a priority due to the pressures they were experiencing in other areas of their new profession.

Katherine, Allison, Jessica and Melissa all felt like they needed to learn what and how to teach before they could think about integrating technology into their literacy lessons. Melissa shared that she was managing many components of teaching for the first time and felt like she did not have prior experience upon which to draw:

> I think I just need to know what I'm teaching, how to teach it, how to manage my class, where the year is going curriculum-wise, and then next year if there were more opportunities to use technology I'd be like, 'Okay, well I know that last year, this was something that worked and this was something that I think would benefit from maybe adding a little technology' and just sort of go about it that way. At least then we would have something to pull from.

Similarly Allison wanted to hold off on adding technology into her literacy instruction because it felt superfluous and she did not feel ready to add anything extra into her practice. Allison said:

> I feel like I need to get my footing and I need to learn what I'm teaching and reading, let alone how to best use this or that [technological equipment]. So as a first year teacher, I'm like, okay, hold off anything extraneous. Let me know what concept I'm teaching [first].

Katherine commented:

> I'd say this year, as much as I would love to have all that technology in my room, I'm almost glad [that I don't have it]. I'm just getting my foot in the door and learning the curriculum, learning the day in day out, how to even survive.

Jessica said that integrating technology into her literacy instruction was not a priority in her first year of teaching because it would require additional effort, which she felt she did not have given all of the other responsibilities she had as a first year teacher. Jessica commented:

> As a first year teacher, it's like you're just consumed with getting through all the material that you're supposed to get through, that the idea of being proactive and

> developing something that's technology based—if it doesn't already exist—that is way down the list.

Samantha and Elizabeth spoke about the precarious position of being a new teacher within a school community. Both teachers talked about their fear of speaking up or causing trouble by expressing their thoughts on literacy and technology as first year teachers. Elizabeth said, 'It's [being a first year teacher] different in that way. You don't want to cause trouble because you don't want to say anything. You just kind of [say] it is what it is." Samantha also spoke of her fear of speaking up about a piece of malfunctioning equipment. She was worried that as a first year teacher, she would be causing trouble. Samantha offered:

> I don't want to complain about my technology in here. I think, had I been teaching for ten years and I came into this classroom I could say I don't like this set up, this doesn't work for me. But I think I'm a little bit like, I'll just keep quiet. But then I worry…[the principal] is going to come in here and she's going to see me not using the doc cam. Is she going to think that I'm not using it? I want to be using it. I know I should be using it. They definitely expect me to be using it. But I'm a little nervous to say something. So I mean, I guess that's the first year teacher in me, just being nervous to speak up about what's not working.

Six of the participants commented on how the first year of teaching influenced their technology use in the classroom, though they identified different aspects of the first year that kept them from integrating technology into their literacy instruction. Some participants believed they needed to learn more about their craft and subject matter before

they could tackle technology, while others believed technology integration was extraneous and not a priority. Still other participants perceived that their first year teacher status created a fear of speaking up or causing trouble, particularly in regards to technology.

The majority of participants in this study expressed high self efficacy for technology integration (SETI) and positive attitudes toward integrating technology into their literacy instruction, regardless of their lack of experience in the classroom as first year teachers or their levels of satisfaction with the technology components of their preparation programs. Research in the field has shown that both SETI and attitudes toward technology integration are two of the most significant factors in teachers' actual use in the classroom (Anderson, Groulx, & Maninger, 2011; Anderson & Maninger, 2007; Ertmer & Ottenbreit-Leftwich, 2010). These studies have demonstrated that teachers with high SETI and positive attitudes toward technology integration are more likely to use technology in their own instruction. However, the results of this current study contradict these findings, as the majority of participants expressed high SETI and positive attitudes toward technology integration but were only using technology in their literacy instruction approximately once a week and wished to use it more frequently.

The results of this study do align with prior research regarding digital natives, in which studies have challenged the belief that digital natives are more apt to integrate technology into their instruction than their older, digital immigrant colleagues. In fact, past research has found that digital natives are not integrating technology into their professional practice to the same degree that they use technology in their personal lives and do not generally use more technology than their older coworkers (Guo, Dobson &

Petrina, 2008; Kumar & Vigil, 2011; Lei, 2007). These findings stand true with the results of this study which found that most of the digital native participants did not use technology more frequently than their digital immigrant participant counterparts.

Summary

This chapter presented three major findings generated from this instrumental case study. Data were collected in a three-step process consisting of interviews, technology asset matrices, and a focus group. Using the constant comparative method (Lincoln & Guba, 1985), data were coded in three rounds using In Vivo, open, and axial coding. Codes were grouped into themes that were organized into three central findings. The findings of this study: first year teachers feel unprepared by their teacher preparation programs to teach literacy using technology; first year teachers use some technology to teach literacy, but also identify barriers to further use; and first year teachers feel confident to teach literacy with technology, create a framework for understanding how first year teachers describe their teacher preparation and use of technology to teach literacy.

This study found that first year teachers are using some aspects of technology to teach literacy, but are able to identify barriers that are keeping these teachers from using technology to teach literacy as frequently as they desire. These barriers are consistent with those found in the literature and participants focused on external obstacles as opposed to internal obstacles, like SETI and attitude.

This research also found that despite feeling overwhelmed by the unique pressures of the first year of teaching, participants felt confident to teach literacy with technology regardless of their level of training or current classroom use**.** These findings

contradict the literature, as SETI and attitude have shown to be predictors of technology use but the participants who shared high levels of SETI and positive attitude were using technology infrequently and desired to use it more often.

The findings from this study demonstrate the complex interplay between preservice training, schools as they exist today, and the attitudes and beliefs of teachers as they navigate the unique experiences and challenges of the first year of teaching. The following chapter will further discuss the implications of the results of this research.

Chapter V: Discussion and Conclusion

Introduction

The purpose of this case study was to determine how first year teachers describe their teacher preparation and use of technology to teach literacy. This was done by considering how teachers' descriptions demonstrate self-efficacy, identify challenges and obstacles, and distinguish benefits of technology integration in literacy instruction. In this study the term technology will include the hardware, software, equipment, and tools that assist students and teachers in their tasks throughout the school day. This qualitative case study was conducted in a three-step process beginning with participant interviews, followed by a technology asset matrix for participants to complete, and finally, a one-time focus group. The participants in this study were seven first year elementary school teachers from one American school district. Data were qualitatively analyzed using the constant comparative method.

The data collected revealed the following findings: first year teachers feel unprepared by their teacher preparation programs to teach literacy using technology; first year teachers are using some technology in their literacy instruction but identify barriers keeping them from using technology as much as they would like; and first year teachers have high self-efficacy in technology integration (SETI) to teach literacy with technology regardless of their prior training or sense of preparedness.

The purpose of this chapter is to provide an interpretation and discussion of the study's findings, address limitations in this research, and provide recommendations and suggestions for future research on this topic.

Discussion of Findings

The research question driving this study was, "How do first year elementary school teachers describe their teacher preparation and use of digital technology to teach literacy in the classroom?" The related sub questions were, "In what ways do first year elementary school teachers' descriptions demonstrate self-efficacy in teaching literacy with digital technology?" "What are first year elementary school teachers' perceived challenges and obstacles to teaching literacy with digital technology?" "What are the perceived benefits of teaching literacy with technology?"

These questions were answered through a series of one-time, one-on-one interviews, technology asset matrices, and a one-time focus group. While each participant's experience was unique and added a different perspective to the understanding of the subject, there were patterns in the first year teachers' responses that developed into the three major findings in the study. The significance of these findings is explored below.

Training during teacher preparation courses. The majority of participants in this study believed that the courses in their teacher preparation programs did not address teaching literacy with technology and thus did not prepare them to do so. However, the one first year teacher who did have a technology component in her literacy course also did not find it helpful. First year teachers wished that their programs had provided opportunities to integrate technology into their literacy instruction, as they believed this would make it easier to teach literacy with technology in their current positions. This supports Ajayi's (2011) finding that preservice teachers are concerned about their teacher education preparation and its applicability to real world classroom scenarios.

The participants in this study came from undergraduate, graduate, and post-baccalaureate programs at three different public and private universities, thus providing a range of degrees and institutions. First year teachers' dissatisfaction with their teacher preparation coursework was not limited to one type of degree or one teacher preparation program. If none of the teachers in this study were satisfied with the technology integration in their literacy coursework, perhaps their dissatisfaction is a reflection of what is occurring (or what is not occurring) in a variety of academic settings. First year teachers are reporting that they were not trained to teach literacy using technology. As a result, we can assume that pre-service teachers in this study have not received instruction on the use of technology in literacy classrooms. We can not make generalizations given the size of the subject sample, but we can surmise that this might be true for many pre-service teachers as this research contributes to a growing body of quantitative and qualitative studies that attest to both perceived and actual lack of preparation (Ajayi, 2011; Kopcha, 2012; Sutton, 2011; Tondeur, van Braak, Sang, Voogt, Fisser, Ottenbreit-Leftwich, 2012). In short, first year teachers seem more likely to be graduating from teacher preparation programs feeling unprepared to teach literacy using technology, based on this sample population.

Upon examining this issue through the theoretical lens of social constructivism, in which knowledge is socially created through human activity and meaning is constructed throughout the learning process via experience (Merriam, Cafarella & Baumgartner, 2007), it appears that the participants could have benefited from increased opportunities in their coursework to develop their own knowledge and understanding of technology integration in the literacy curriculum. According to the constructivist paradigm, these

teachers require opportunities to construct meaning through discussions, interactions with others, and opportunities for hands-on experimentation in order to develop an understanding of technology integration that they can then apply to new scenarios and settings.

Embedding technology components within literacy methods courses, with an emphasis on practical, relevant assignments that could be applied to the classroom, is one way to support constructivist learning while addressing the dissatisfaction and feelings of unpreparedness that first year teacher experience. The challenge in this is that universities are tasked with training teachers who will then accept positions in vastly different communities with unequal technological resources and diverse values regarding the importance of technology in the curriculum. Thus, in the design of literacy courses that include technology, it is impossible to include every possible iteration of equipment or application available in public schools across the country. Therefore any literacy and technology course limits the exposure of preservice teachers to its own scope and sequence.

The true issue that teacher preparation programs face in the digital age is how to prepare teachers for a variety of educational environments with a wide range of technological access and devices that are rapidly evolving. Perhaps the goal is not to teach the technology but to teach the teacher by building a foundation of pedagogical practices, technical skills, and content knowledge, as well as an understanding of how these concepts are interrelated (Koehler & Mishra, 2009). This integrative knowledge base, known as Technological Pedagogical Content Knowledge (TPACK,) is formed under the assumption that technology should be connected to specific content areas and

that instruction using technology requires a range of learning and teaching practices (Tondeur, van Braak, Sang, Voogt, Fisser, Ottenbreit-Leftwich, 2012). Perhaps if universities ascribe to the philosophy of TPACK in their teacher preparation programs, as Hammett and Phillips (2014) suggest, preservice teachers would enter their first year of teaching with the skills and confidence needed to incorporate technology into their instruction.

Training during student teaching. This research found that student teaching was a critical component of technology preparedness for the first year teachers studied. Five out of the seven participants were able to identify a technology requirement in their student teaching. Moreover, the majority of the first year teachers had positive experiences integrating technology into their practice. Most of the participants' positive experiences were attributed to existing conditions in their placement schools; cooperating schools and supervising practitioners who were already using technology in their practice. Participants with positive experiences shared that they had anticipated using technology in similar ways in their own classrooms. Cuenca (2011) and Tondeur et al. (2012) similarly found that working under the supervision of supportive, highly-skilled cooperating teachers created positive learning environments for preservice teachers in which these teacher candidates had the opportunity to observe and practice the skills modeled for them.

The existing conditions in their student teaching settings were perceived by the participants to be an important factor in their satisfaction with their student teaching training. The participants shared that they were able to observe best technological practices in their cooperating classrooms and then were given opportunities to try these

strategies themselves. This appears to be an example of Situated Learning Theory (Lave & Wenger, 1991) in which the cooperating teachers steadily moved from delivering information to modeling and coaching in their own real classroom settings. In this way these preservice teachers were introduced to communities of practice in which they were able to learn first-hand the norms and technological skill sets of experienced teachers. The participants also described their increased responsibility in the classroom as their practicum went on, which is considered legitimate peripheral participation in Situated Learning Theory. By gradually taking on more responsibility in their host classrooms, the preservice teachers were participating in both physical and social experiences that generated meaning and knowledge.

The findings of this research and those supported in the literature suggest that schools and mentor teachers that have and use technology regularly and expect their student teachers to do the same, produce new teachers who expect to use it in their own practice. The struggle therein lies in the potential dichotomy between the teachers' cooperating host schools and the actual classrooms in which they are employed. Like many participants in the study who anticipated using technology in their own classrooms in similar ways as they did in their cooperating schools, it is possible that first year teachers may not be able to transfer the skills they learned from their student teaching because the technology simply isn't there. Or it is possible that student teachers were more comfortable using technology that was modeled for them by their cooperating teachers. This might account for their comfort with certain kinds of technology, particularly the technology that was used by their cooperating teachers. Alternately,

preservice teacher with insufficient technology training during their student teaching could end up working in high-tech school districts with unfamiliar devices and software.

Again, this creates a challenging situation for teacher preparation programs as preservice teachers may graduate with unequal technological training due to the unique pre-existing conditions of various student teaching sites. It would be ideal for all student teachers to be placed with supervising practitioners who exhibit high use of technology in their own instruction, as Haydn & Barton (2007) and Angeli & Valanides (2009) found that observing a competent mentor teacher using technology is an important motivator in technology use. However, the likelihood of every U.S. preservice teacher being placed with a veteran supervising practitioner that is both willing to mentor a new educator and is also highly technologically qualified is slim, considering that less than half of veteran classroom teachers report using technology often during instructional time (Gray, Thomas, & Lewis, 2010).

While it may be unrealistic to expect teacher preparation programs to streamline all student teaching scenarios into one uniform experience, perhaps the emphasis for equity and uniformity in technology training is not on the student teaching, but rather on the preceding coursework. If all U.S. teacher preparation programs implemented their technology requirements in the same thorough ways perhaps there would be more equity in teacher training and greater satisfaction from preservice teachers.

Actual use. All 7 participants reported using technology in some form in their literacy instruction on average about once a week. All of the first year teachers used district provided equipment and two participants supplemented the district's technology with their own personal devices. Laptops, desktop computers, document cameras,

interactive e-books, online magazines and word processing software were the most widely used technology reported.

The participants shared that the majority of the technology used during their literacy block was used for teacher demonstrations and modeling, with an emphasis on projecting visuals for students to see. Although some teachers did share ways in which they were integrating technology into their literacy instruction for student use, these opportunities for student practice were limited by the availability of the shared media center or the school's laptop cart.

One way that the first year teachers tried to circumvent the issue of student access to technology was to bring personal devices into the classrooms for students to use. Two participants shared that they brought in their iPads and Kindles for students to use. One of the two participants also said that she bought a second iPad with her own money just for student use in her classroom. While it may seem surprising that a first year teacher would make such a significant purchase for her classroom, it's important to note that it is customary for teachers to purchase or bring in things for the classroom that they have purchased out of pocket. Typically these items are smaller, consumable school supplies, but perhaps technological equipment is the next trend. If more teachers do start bringing in their own technology to supplement what is provided, school districts may face significant challenges. One of the potential challenges is that a teacher's personal device may exist on a platform that is not supported by the district. This makes it more difficult for a district to support a teacher's technology use if the personal and district-wide devices don't work together. School districts will have to decide if the use of personal technological devices in the classroom is encouraged, discouraged, or simply ignored.

It is important to note that the participants' use of technology to teach literacy appears to remain in the traditional literacy paradigm, in which reading and writing are taught and learned as printed words on a page. As stated above, most of the technology integration attempted by participants was used for teacher demonstration and for modeling, and even the small amount of student-centered work was focused on reading pre-produced content on a screen. Though the participants were indeed using technology to teach traditional literacy, they were not using technology to support multiliteracies, New Literacy, or multimodality, in which teachers and students are creating shared content and generating new meaning from interactions with each other as well as communicational resources.

Proponents of multiliteracies (Kitson, Fletcher & Kearney, 2007) believe traditional print-based reading and writing practices cannot only be brought to a screen to be considered digital literacy, but rather these practices must be revamped to accommodate multimodal tools that require multiliterate skills. This means that ideally, teachers integrating technology into their literacy curriculums would move beyond using technological tools as a way to disseminate information and shift their methods to adopt practices that allow for the collaborative construction of knowledge and the opportunity for students to extend their thinking using a variety of interactive media.

While this study did not find evidence of multiliteracies in the participants' responses regarding their technology integration practices, one way to extend their instructional repertoires beyond traditional literacy methods might be to incorporate the Technological Pedagogical Content Knowledge (TPACK) framework into the first year teachers' instructional design. The TPACK model would allow the first year teachers to

tailor their instruction to content that supports multiliteracies and to the needs of their specific students while incorporating opportunities for multimodality. However, this might prove challenging without support and guidance from administration.

Lack of support. Three of the seven participants shared that their use of technology was self-driven and without any mandates or encouragement from the administration. They said their lessons using technology were self-developed and it was up to them to obtain any of the equipment they might need. According to the participants' responses, it appears that in this particular district, technology use was at the discretion of the teacher; teachers who did not feel driven or motivated to integrate technology into their instruction weren't required to do so, and teachers who were using technology weren't supported or rewarded for their actions. This begs the question, does more pressure or support from administrators, or requirements for students like the Common Core, need to occur in order to make teachers use technology? Or, will it be the move towards computer-based standardized tests, like the PARCC (Partnership for Assessment of Readiness for College and Careers) exams, that create the push towards technology integration? Why are administrators reluctant to encourage and offer incentives for faculty to use technology?

Inan and Lowther (2010) found that institutional factors like administrators' overall support for school technology, technical support, and professional development directly impact teachers' readiness to use laptops in the classroom and, in turn, whether they actually did. The study found that technologically supportive school environments with high levels of administrator interest, commitment, and encouragement housed teachers that were consistently using technology in the classroom. If administrators want

to encourage or prioritize technology integration, they may need to either provide incentives for teachers to add technology into their practice, or require and evaluate technology integration throughout the school year. In either case it appears that some sort of external motivator would be helpful to first year teachers in order to promote technology integration in the literacy curriculum.

Barriers to use. Based on participants' responses, the three most widely experienced barriers to technology use in literacy instruction were access to equipment, equipment failure, and lack of experience or training. First year teachers didn't have equipment in their classrooms or were restricted by shared computer labs or laptop carts, had negative experiences with equipment malfunctioning, and felt that they didn't have assistance or training with district-provided equipment or software. This is supported by Kopcha's (2012) review of the literature in which access, beliefs, time, and professional development were identified as the most significant barriers to teachers' technology use.

It appears that an overarching theme within the participants' identified barriers to use is the desire for support; they are looking for someone to help them gain more frequent access to equipment, assist during equipment failure, and lead them through the initial training and implementation. It appears that first year teachers need guidance and help with the problem solving that occurs in the initial steps of integrating technology into the curriculum: training on the equipment, securing access to the necessary devices and software, and troubleshooting through preliminary difficulties. This recommendation is supported by Lowther, Inan, Strahl, & Ross (2008) and Boulay & Fulford (2009) who both found that mentored teachers used technology more frequently than teachers who

did not have a mentor, reported positive attitudes toward common barriers, and were also able to effectively resolve technology issues with minimal support.

The findings of this study challenge the belief that digital natives enter the workforce with the experience, skills, and know-how to seamlessly and independently integrate technology into their careers. This particular research shows that digital natives desire support, encouragement, and training to use technology in their literacy instruction. Teacher preparation programs and school districts alike cannot assume digital natives enter knowing everything they need to successfully use technology. Instead, digital natives need to be taught not only the technological skills required in the classroom, but also explicitly how these skills can effectively be integrated into curriculum and instruction.

Self-efficacy. In this study, five of the seven participants expressed high levels of self-efficacy in technology integration (SETI) regardless of how often they were actually using technology to teach literacy in the classroom. Four of the five participants with high SETI attributed this to being a digital native and using technology throughout their own education and for personal use. This high level of SETI in the digital native subset could also potentially be attributed to the participants' learning being situated within their student teaching experiences in ways that allowed for legitimate peripheral participation.

Some researchers believe SETI is influenced by technological proficiency (Anderson & Maninger, 2007), meaning that teachers who already have the necessary skills are confident whereas teachers' frustration at their lack of skills decreases their self-efficacy. While the majority of participants in this study expressed high levels of confidence in their abilities to use technology in the classroom, they also believed they

were unprepared to teach with technology and did not have the skills or training to use the equipment offered in their schools and classrooms. Thus it appears there is a contradiction in these results, as the participants believed they had high SETI but did not feel that they were appropriately prepared by their teacher preparation programs nor did they feel that they were prepared to use the equipment in their current schools. The results of this study more adequately align with Lee and Lee's (2014) finding that technology skills do not predict actual practice.

The majority of the recent research on SETI (Chen, 2010; Ertmer & Ottenbreit-Leftwich, 2010; Lee & Lee, 2014; Teo & Ko, 2010; Wang, Ertmer, & Newby, 2004) has found that self-efficacy beliefs regarding technology integration is one of the most significant and determining factors of teachers' actual technology use in the classroom. However, the results in this study contradict popular findings. In this study, the first year teacher that expressed the highest SETI also self-reported the least frequent use of technology to teach literacy, while the participant who self-reported the most frequent use of technology expressed the lowest SETI of the group. This demonstrates that in this particular study, self-efficacy beliefs were not a significant factor in determining a first year teacher's actual technology use.

The first year of teaching. The results of this study found that the majority of first year teachers found their initial year of teaching to be overwhelming, challenging, and often difficult. The participants spoke of needing to understand the curriculum and how to teach it before considering the integration of technology. Some of the participants shared that in relation to the other responsibilities and challenges of the first year of

teaching, technology seemed extraneous and not a priority. Other first year teachers felt apprehensive to speak up regarding their technological needs in the classroom.

These findings indicate that first year teachers may feel bogged down, and in some cases intimidated, by the responsibilities and unique experiences of the first year of teaching. These results are supported by the findings of Thomas and Beauchamp (2011) who learned that new teachers adopt a survival mode in the first year during which they have a lower level of confidence in their instructional abilities. First year teachers seem to feel that they do not have time for technology given everything else they are expected to learn and do. First year teachers appear to view technology as an "extra" rather than a necessary component of the curriculum.

To address the needs and challenges experienced by first year teachers, schools need to find better ways to support their newest and most vulnerable employees. While mentoring programs are a common practice, it seems that the support of a single, more experienced colleague isn't enough to mitigate the stress and feelings of being overwhelmed that may be keeping first year teachers from implementing technology into their practices.

Instead schools should anticipate that first year teachers might be hesitant to reach out for help, particularly with technology. Schools might provide teachers with access and resources to technology early on in the induction process. This could be done with the help of full time, in-house technology specialists whose roles are to seek out new teachers to support, train teachers on new and existing equipment and software, demonstrate lessons, and help with whole class activities using the media lab or shared laptop carts. Perhaps if teachers felt more supported, knew where to seek out help when

needed, and believed there was another individual with whom to share the responsibility of technology integration, they might be more willing to take on that challenge.

Attitude. Even though they all said they weren't teaching literacy with technology as often as they would like, the majority of the participants in this study believed technology in literacy instruction was an asset to education, with benefits for both teachers and students. The first year teachers shared that technology had the potential to make their jobs easier and provided opportunities for professional development, while they believed students benefitted from increased engagement, more opportunities for differentiating learning and providing accommodations, and necessary exposure to the digital world.

While most of the participants had positive attitudes toward technology and could identify personal benefits and benefits for students, these teachers were still only using technology in their literacy curriculum on average once a week. The first year teachers acknowledged the advantages of technology integration, yet still weren't using it regularly themselves and could identify the barriers in their way. This could be because the barriers to use that the participants' identified felt greater or more insurmountable than the possible gains that technology integration could offer. Or, as discussed above, the challenges and struggles of the first year of teaching may have made technology integration seem superfluous in the first year.

Two participants in the study did not believe that technology was always appropriate or beneficial for students. These teachers said that they did not think technology always elevated levels of instruction and could often detract from lessons. Furthermore these teachers were concerned with prolonged screen time and an over-

dependence on technology for their students. These two teachers were the oldest teachers in the group, and were not considered digital natives.

Is teachers' positive attitude toward technology integration related to age and/or exposure to technology by being a digital native? Are teachers' attitudes about technology formed on the job, during preparation programs, or even earlier in their own K-12 or college-age programs? Do individuals' attitudes regarding technology integration form during their own educations? If so, isn't it even more imperative that teachers use technology in the classroom today so that future teachers are learning from example and develop positive attitudes that they will, in turn, carry into their own future classrooms?

Implications

Teacher preparation programs must prioritize technology. Teacher preparation programs need to prioritize the technology training of their preservice teachers by providing constructivist learning opportunities using both stand-alone technology courses and technology requirements embedded within methods courses. This is particularly important within literacy courses where technology is not often present. Currently, teacher preparation programs are not obligated to require both types of technology offerings within one program or course of study (Gronseth et al., 2010). However, doing so would provide preservice teachers with situated learning opportunities through hands on training using specific technological equipment and software during stand-alone technology courses while also facilitating opportunities to apply these skills and practice integration within methods courses. More frequent and thorough situated

opportunities to practice integrating technology into their repertoire may foster greater confidence in preservice teachers and carry over into their roles as first year teachers.

Similarly, teacher preparation programs should be dedicated to matching preservice teachers with supervising practitioners who exhibit high levels of technology integration and are highly qualified to mentor in this area. A greater focus on providing quality student teaching environments to preservice teachers with the most competent and skilled mentor teachers would offer teacher preparation programs another avenue to insure technology preparation prior to employment.

Teacher preparation programs can meet the nation's standards for technology integration in a variety of ways. As a result, there is little consistency in the technology preparation of preservice teachers across institutions (Gronseth et al., 2010). This is cause for concern if U.S. preservice teachers are being provided with different and unequal tools, yet are expected to accomplish the same goal. Uniform technology training and requirements across U.S. teacher preparation programs are needed to create an equal playing field for all preservice teachers to meet the National Education Technology Standards for Teachers. By creating a high-level and consistent standard for the amount of time and ways in which preservice teachers train with technology, teacher preparation programs can elevate both the skills and the technological confidence that these individuals bring to their own classrooms in their first year of teaching.

Schools must provide technological supports to first year teachers. Most first year teachers recognize the benefits of using technology to teach literacy, experienced technology use in their own educations, and yet many are not using it in their own classrooms. While able to discuss the importance of technology integration, these

teachers are also able to identify the many barriers that keep them from incorporating technology into their practice. The common thread among these barriers is the apparent need for support from a more experienced individual in order to overcome the obstacles first year teachers face when challenged with technology integration.

First year teachers often begin their careers feeling overwhelmed with their responsibilities and hesitant to reach out for help in fear of causing trouble. From the very first day of the year, schools should be providing supports to first year teachers in the form of full-time technology specialists whose role is to support and facilitate technology integration in the classrooms. While many schools do have some form of technology support, these positions are often part-time or shared between buildings and teachers need to know where to go to seek out the help they need. Instead, schools should have a preemptive technology mentoring program that is brought to first year teachers before the school year begins. In this way, technology specialists can coach first year teachers in technology use and help with integration into the curriculum.

Technology mentoring provides the support first year teachers seek and addresses the current barriers to use. It also pushes new teachers to consider technology as an essential component of practice rather than an extraneous burden. Technology mentoring also addresses the issues experienced by digital natives as they enter the workplace by helping younger first year teachers find ways to apply the technology they use in their personal lives into the classroom, while also supporting new digital immigrant teachers who have potentially different attitudes toward technology and unique sets of technological skills.

Study Limitations

This particular study provided an overview of teacher perceptions of their technology integration in their literacy instruction. However the findings of this research are specific to the elementary schools of one particular American school district. It is unknown whether the results of this study would apply to the middle schools, high school or other elementary schools in other school districts across the United States.

Furthermore, the participants in this study were all female. While the majority of the first year elementary school teachers in the district were female, this sample was not entirely representative of the gender distribution of district's new hires and does not include a male perspective. Additionally, the number of participants in the study is smaller than ideal. According to Guest, Bunce, and Johnson (2006) twelve participant interviews within a homogeneous group is satisfactory to achieve saturation in qualitative research. Although sixteen participants were solicited for this study, only fourteen individuals responded, and of those, eight people qualified to participate. Seven individuals ultimately agreed to participate in the study, which is a sample size considerably smaller than recommended for interview research.

Similarly, this study had a small number of participants for the focus group portion of data collection. Morgan (1997) recommends six to ten participants within a single focus group. This study had four of the seven original participants in the focus group. A larger number of participants in the focus group could have allowed for more varied or expanded responses to the focus group questions.

Another potential limitation is the fact that this research was conducted in the school district in which I was employed. Critics of insider research like Brannick and

Coghlan (2007) and Anderson and Herr (1999) believe insider research creates ethical issues in which the researcher's personal and emotional investment in the setting can influence the collection and interpretation of data and its overall validity. Although I did not know any of the participants prior to this study, it is possible that the participants' responses were skewed by the fact that they knew we were colleagues. It is also possible that my interpretation of participants' responses could have been influenced by my prior knowledge of the school district.

Future Research

While the findings of this study have provided insight into first year teachers' perceptions of their experiences with technology in their training programs and in their current literacy practices, further research in necessary. Future studies might consider a deeper examination of the current technology practices in teacher education programs in order to determine if stand-alone technology courses, technology embedded in methods courses, technological requirements in student teaching, or some combination of the three are the most effective ways to prepare preservice teachers for the classroom. Additional research on effective technology integration into the elementary literacy curriculum may be advantageous in adding to a body of work that has predominantly focused on how technology can be used in subjects like math and science. Further studies of first year teachers' use of technology among those who were placed with cooperating teachers who exhibit high levels of technology integration might lend some information about the importance of selection of cooperating teachers. Another study might examine the use of technology among first year teachers in schools in which there are administrators who use and promote technology over other attributes.

Further study on how the unique experiences of the first year of teaching influence SETI could provide valuable information to the field of technological self-efficacy research, while an exploration of how best to support digital natives in their first year of teaching may also yield helpful information for educational researchers and school districts.

Conclusion

The purpose of this research was to examine how one group of first year teachers described their teacher preparation and use of digital technology to teach literacy in the classroom and how they described the perceived obstacles and benefits of doing so. Specifically, this study asked, "How do first year elementary school teachers describe their teacher preparation and use of digital technology to teach literacy in the classroom?" with three related subquestions:

- "In what ways do first year elementary school teachers' descriptions demonstrate self-efficacy in teaching literacy with digital technology?"
- "What are first year elementary school teachers' perceived challenges and obstacles to teaching literacy with digital technology?"
- "What are the perceived benefits of teaching literacy with technology?"

Qualitative research was employed in order to understand the issues and experiences directly from the participants, while also allowing me to investigate the multiple issues that existed within the research questions. An instrumental case study was chosen to conduct an in-depth exploration of a bounded system in order to provide insight into the specific issue of technology integration in literacy instruction. The case

was bound by its two-month duration as well as by the singular school district in which the participants were employed.

The participants in this study were seven first year elementary school teachers from one American school district. All seven participants were female and ranged in age from 22-45. These first year teachers came from a range of teacher preparation programs including undergraduate, masters', and post-baccalaureate programs from both public and private institutions, and were teaching kindergarten through fifth grade.

Data were collected in a three-step process that began with one-time semi-structured one on one interviews. After the interviews were complete, participants filled out a written technology asset matrix. A focus group was conducted to complete the data collection process. Data were analyzed using the constant comparative method (Lincoln & Guba, 1985).

Based on the data collection and analysis, the following major findings were generated:

- First year teachers feel unprepared by the literacy courses and student teaching assignments within their teacher preparation programs to teach literacy using technology.
- First year teachers are using some aspects of technology to teach literacy, like district-provided laptops and student-centered software, but are able to identify barriers, including access to equipment and equipment failure, that are keeping these teachers from using technology to teach literacy as frequently as they desire.
- Most first year teachers identify as confident in their ability to teach literacy with technology. However, it is the unique circumstances of the first year of teaching

that have created feelings of being overwhelmed that, in turn, have limited the ways and frequency of technology use during literacy instruction.

The implications of these findings were that teacher preparation programs must prioritize technology in order to prepare preservice teachers for the classroom by streamlining course requirements and by providing preservice teachers with technologically competent cooperating teachers. Also, schools must provide technological supports for their first year teachers in the form of technology mentors that can provide the assistance and scaffolding that teachers seek in their first year of teaching. Further research on the current technology practices in teacher preparation programs and the impact of the first year of teaching on SETI would be beneficial to further develop these ideas.

This study was limited by its sample, which was small and did not accurately reflect the gender distribution of the school district's first year teacher population. Another potential limitation to the research is that it was conducted in the school district in which I work. Though I did make sure to exclude any individuals with whom I worked or whom I already knew, critics of insider research believe research within one's own setting creates ethical issues.

Despite its limitations, this study provided valuable insight into the perceptions and experiences of first year teachers as they attempted to use technology in their literacy practices and contributes to the growing body of similar research that confirms that current teacher education is inadequate in this regard. While these first year teachers understood the benefits of teaching with technology and felt confident to do so, they were hesitant to integrate it into their own practices. This exposes an issue of great importance

in the nation's educational system as school districts invest in high-tech equipment and a workforce of digital natives who aren't using it.

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Appendix A
First Year Teachers and Digital Literacy: A Case Study
Consent Form

Dear Participant,

The following information is provided for you to decide whether you wish to participate in the present study. You should be aware that you are free to decide not to participate or to withdraw at any time without affecting your relationship with the researcher or Framingham Public Schools.

This study seeks to examine how first year elementary school teachers from one school district describe the methods in which they were trained to teach literacy with technology, their self-efficacy in doing so, and their actual use of technology in the classroom. Specifically, the research question is "What is the perceived relationship among first year elementary teachers' self-reported pre-service technology training, their technological self-efficacy, and their use of technology to teach literacy in the classroom?" The procedure will be a single instrumental case study design, using interviews, focus groups, and classroom observations.

Data will be collected in the form of a one-on-one interview that will be recorded by the researcher for transcription purposes. You may request to see the interview protocol before consenting to participate in this study or before participating in the interview. The researcher may request a follow-up interview. You may also be invited to participate in a focus group, which will be video recorded and classroom observations that will not be recorded. Protocols for both the focus group and observation will be available to you beforehand, if requested. You are free to opt out of any or all forms of data collection at any time.

Do not hesitate to ask any questions about the study either before participating or during the time that you are participating. The researcher will be happy to share the findings with you after the research is completed. This research may be used in future publications. However, your name, your school, and the grade level in which you teach will not be associated with the findings in any way, and your identity as a participant will be known only to the researcher.

This study has been reviewed by the Institutional Review Board at Lesley University. You may contact Dr. Audrey Dentith, dissertation chair, or either of the IRB co-chairs listed below with any questions or concerns before, during or after your participation.

There are no known risks or discomforts associated with this study. The expected benefit associated with your participation is the opportunity to reflect on your digital literacy training and practice.

Please sign your consent with the full knowledge of the nature and purpose of the procedures. A copy of the consent form will be given to you to keep.

_____ _____

Signature of Participant Date

Appendix B
First Year Teachers and Digital Literacy: A Case Study
Interview Protocol

Interviewer: Emily Kearns Burke
Participant Pseudonym:
Date of Interview:
Time:

Interviewer (I):I appreciate your willingness to be interviewed today. As I indicated earlier, the purpose of this project is to learn more about how first year teachers from this school district describe their training to teach literacy with technology, their actual practice in the classroom and their feelings of self-efficacy in using technology in literacy instruction. You are free to decide not to participate or to stop the interview and withdraw from the study at any time without affecting your relationship with me or with your school district. This interview should last about half an hour and will be recorded. Would you like to begin?

I: Can you tell me about the technology requirements in your teacher preparation program?

Probes if necessary: Were there any technology requirements specific to your literacy courses?

What about technology requirements specific to literacy in your student teaching?

How did you feel about the in-class and/or student teaching technology requirements?

How did you feel about using technology in your literacy courses, assignments, and/or student teaching?

I: Have you transferred anything you've learned about teaching literacy with **technology** to the classroom you have now? Can you talk about this?

Probe: What else do you **wish** you could transfer from your teacher prep to your current classroom?

I: Do you use technology to teach **literacy** in your classroom?

If yes I: What kinds of technology do you use and how do you and your students use it?

I: Can you give me an example of how you've used (type of technology provided by participant) in a lesson?

I: Why are you using these types of technology to teach literacy?

I: What benefits do you or your students receive from using technology to teach literacy?

I: What limitations or drawbacks do you or your students experience from using technology to teach literacy?

If no I: Can you tell me more about why you don't use technology to teach literacy?

I: Would you like to teach literacy using technology? What would you want or need to make that happen?

I: What do you think are the obstacles that keep you from teaching literacy with technology?

I: Can you talk about your level of self-confidence in using technology to teach literacy in your classroom?

I: Do you feel like your prep program prepared you to teach literacy with technology?

I: What factors do you think might be affecting how you feel?

I: Is there anything else you would like to add that I have missed?

Demographic info:

Age:

Gender:

Grade Level Taught:

Type of Teacher Preparation (undergraduate, graduate, other):

Appendix C

Technology Asset Matrix

Adapted from McClay and Mackey's (2009) Asset Model of Contemporary Literacy Experiences

For each item of technology, please mark if you know what it is, if you use it at home, if you use it at school to teach **literacy**, and/or if you use it at school outside of literacy. Check off all items that are true.

Type of technology	**I know what it is**	**I use it at home.**	**I use it at school to teach literacy**	**I use it at school outside of literacy**
blogs (authoring)				
blogs (reading)				
computer games				
database				
desktop computer				
digital camera				
document camera				
dvd				
email				
e-readers				
graphics				
instant messaging				
laptops				
library database				
literary hypertext				
online magazines				
Outliner				
podcast				
Presi				
PowerPoint				
shared editor (wiki)				
simulations				
smartboards				
smartphones				
speech recognition software				
spreadsheets				
social networking sites				
tablets				
video cameras				
web authoring software				
word processing software				

Appendix D
First Year Teachers and Digital Literacy: A Case Study
Focus Group Protocol

Interviewer: Emily Kearns Burke
Participant Pseudonyms:
Date of Focus Group:
Time:

Interviewer (I):I appreciate your willingness to participate in a focus group today. As I indicated earlier, the purpose of this project is to learn more about how first year teachers from this school district describe their training to teach literacy with technology, their actual practice in the classroom and their feelings of self-efficacy in using technology in literacy instruction. You are free to decide not to participate or to remove yourself from the focus group and withdraw from the study at any time without affecting your relationship with me or with your school district. This focus group should last about half an hour and will be recorded. Would you like to begin?

I: Some of these questions will be repeats of what I've asked you individually, but I'm hoping that we can generate some conversation since we have a group together now.

I: How would you describe the technology preparation in your teacher preparation program?

I: What have you transferred from your technology preparation to your current classroom?

I: Do you use technology to teach literacy in your classroom now?

I: How frequently are you using technology in your literacy block?

I: What sorts of things help or support you in using technology to teach literacy?

I: What are the barriers and obstacles to teaching literacy with technology?

I: Can you talk about your level of self-confidence in using technology to teach literacy?

I: How does being a first year teacher play a role in all of this?

I: Is there anything else you would like to add?