

PRESERVICE TEACHERS' PERCEPTIONS OF USING DIGITAL TECHNOLOGIES
IN LITERACY INSTRUCTION

by

Melissa Pierczynski
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Committee:

Gary R. Galluzzo Chair
Scott Pearson

William

James K. ... Program Director

Michael C. Dean, College of Education and Human
Development

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George Mason University
Fairfax, VA

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Doctor of Philosophy at George Mason University**

by

**Melissa Pierczynski
Master of Science
Saint Xavier's University, 2003
Bachelor of Science
Eastern Illinois University, 2000**

**Director: Gary Galluzzo, Professor
College of Education and Human Development**

**Fall Semester 2015
George Mason University
Fairfax, VA**



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Dedication

“Education is the most powerful weapon which you can use to change the world.” -

Nelson Mandela.

I dedicate this to my children: Jack, Claire, and Ryan.

You too have the potential to make the world a better place.

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List of Abbreviations

International Reading Association	IRA
National Council of Teachers of English	NCTE

Abstract

PRESERVICE TEACHERS' PERCEPTIONS OF USING DIGITAL TECHNOLOGIES IN LITERACY INSTRUCTION

Melissa Pierczynski, Ph.D.

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Dissertation Director: Dr. Gary Galluzzo

In order to best prepare our preservice teachers to incorporate digital technologies into future literacy instruction, we must first explore how they perceive implementation of digital technologies in literacy instruction. Limited research exists which examines the employment of digital technologies in literacy instruction, and even less considers preservice teachers' perceptions of using digital technologies in literacy instruction. Therefore, this study seeks to explore their perceptions of utilizing digital technologies in literacy instruction. Ten preservice teachers entering into a licensure program at two East Coast universities were used as participants. Data was collected in the form of semi-structured interviews. A constructivist perspective guided the study and a grounded theory approach was used during the data collection and analysis of the study. The findings from this study imply that current preservice teachers are frequent technology users who hold generally positive perceptions regarding the use of digital technologies

for literacy instruction. Unfortunately, they lack educational experiences using digital technologies in either K-12 or 12-16 to draw upon in imagining future literacy instruction. This implies that teacher education programs must be designed to provide preservice teachers with sufficient experiences with and observations of digital technology use in literacy instruction. By exploring this line of inquiry, I hoped to help bridge the gap in our understanding of the influence of preservice teachers' perceptions relating to their eventual use of digital technologies in literacy instruction. We will apply this understanding in determining the nature of professional development they will need in the future.

Chapter One

We live in an ever-changing world. Technology has created advances once thought unimaginable; in particular, digital technologies have changed our daily lives. Businesses are adapting to new communications tools, law enforcement is harnessing the power of the web to conduct investigations never before possible, and medical science is speeding ahead into new and amazing advances in health care. Education is also feeling the push to utilize modern technology to “create engaging, relevant, and personalized learning experiences that mirror students’ daily lives and the reality of their futures” (National Education Technology Plan, 2010, p. x). Within education specifically, these technological advances have caused many changes in both concept and practice, including the definition of literacy, thereby pressuring literacy educators to embrace these new technologies. Traditional print is now moved online, and Web 2.0 tools have made communicating and interacting with others online daily events. Yet, as Rowsell (2013) noted, despite these advances, there remains a gap between the digital literacies and technologies being utilized in daily life and those being used in schools for teaching and learning. It is this divide between the use of technology in society and its use in schools that has caused several national organizations, including the International Reading Association (IRA) (2009); the National Council of Teachers of English (NCTE) (2013); and the National Education Technology Plan (2010), to author position statements urging

the education system to adapt technologies to better prepare our students for an ever-changing world.

Specifically, the IRA believes that “literacy educators have a responsibility to integrate these new literacies into the curriculum to prepare students for successful civic participation in a global environment” (n. p.). However, the integration of digital technologies in classrooms continues to be a slow process (Cuban, 2003; Leu, 2006). Many different barriers have been cited by teachers, such as access and training (Ertmer, 1999; 2005; Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012), to explain the slow transition, but now as we approach a time when access and training are quickly being improved upon (Ertmer et al., 2012; Hutchison & Reinking, 2011), we are left with a more serious barrier: teachers’ beliefs and perceptions of digital technologies in their instructional practices (Ertmer, 2005; Ertmer et al., 2012; Hutchison & Reinking, 2011; Kim, Kim, Lee, Spector, & DeMeester, 2013). Ertmer et al. (2012) found that teachers’ existing attitudes and beliefs toward technology were a major obstacle to the adoption of technologies. Much has been written about the adoption of innovations in education. Specifically, Hall, Loucks, Rutherford, and Newlove (1975) began a discussion on school change by creating the Concerns Based Adoption Model (CBAM) to explore the process a school, or other entity, undergoes in adopting change. Over four decades of research using this model, Hall et al. (1973) found three underlying assumptions regarding the adoption of innovation in education. The first, “change is a process not an event” (p. 2), noted that change does not occur quickly. The second assumption is that an organization as a whole will not change until “the individuals within it actually implement the new ways” (p. 2), which is particularly important because it shows that access and

professional development do not guarantee implementation on the part of teachers. This brings us to the third assumption, which states that for each individual, change is a personal experience and that “people have different feelings and perceptions” as they go through the change process (p. 2). It is those teachers’ perceptions that will affect their ability to change their practices (Bruce & Rubin, 1993; Clark & Peterson, 1984; Ertmer, 2005; Kim et al., 2013; Windschitl & Sahl, 2002; Zhao, Pugh, Sheldon & Byers, 2002). For example, Kim et al. (2013) found that teachers’ beliefs about the nature of knowledge and learning, as well as their beliefs about effective ways of teaching, were related to their technology adoption and integration practices.

Investigating teacher implementation of innovations is important because in the case of technology inclusion in literacy, instruction has been shown to increase student achievement and preparation for the changing world (Coiro & Dobler, 2007; Cviko, McKenney, & Voogt, 2012; Henry, Castek, O’Byrne, & Zawilinski, 2012; Leu, Kinzer, Coiro, & Cammack, 2004; Wolsey & Grisham, 2007). For example, Cviko et al., (2012) found that Kindergarten students engaging in PictoPal, a technology-rich literacy curriculum, had significant learning gains. In addition, as Leu et al., (2004) noted, it is necessary that we equip our students with the skills needed to be successful in a digital society because digital literacy practices are making their way into everyone’s daily personal and professional lives. As the definition of literacy continues to change, we must prepare our students to function in what Leu, Kinzer, Coiro, Castek, and Henry (2013) call “new literacies.” This expression is still being defined, but it refers generally to a theory that embraces “a world where the nature of literacy continuously changes” (Leu et al., 2013, p. 1151). These new literacies include ideas that are being shaped by the current

social practices, such as social media and digital technologies. New Literacy Theory assumes that as technology continues to influence our social practices, those same practices will influence the future function of literacy (Leu et al., 2013).

Using digital technologies to teach literacy is an area of research that is in its infancy regarding teachers' perceptions of technology in literacy instruction. This is even more apparent with regard to the lack of research in preservice teachers' perceptions on technology in literacy instruction. To illustrate this point, some studies have been done that relate to a piece of this research topic (Burnett, 2011; Hutchison & Reinking, 2011), but neither looked specifically at preservice teachers' perceptions of using technology in literacy instruction. Hutchison and Reinking (2011) explored practicing literacy teachers' perceptions of integrating digital technologies into literacy instruction and found several characteristics, such as positive beliefs toward technology and perceived competence, to be associated with higher levels of digital technologies integration and use in literacy instruction. Burnett explored preservice teachers' perceptions of their digital literacy practices and how those perceptions related to their personal identities as future teachers. Understanding preservice teachers' perceptions is vital; it will inform initial teacher education as well as professional development programs since they may need additional teacher education to increase their use of digital technologies.

Literacy's Historical Connection to Technology

Looking at the changing role and definition of literacy across history offers a perspective of the current state of literacy and possibly a glimpse of the direction it will take in the future. As Gee (2010) noted, literacy has always been a collection of cultural and communicative practices shared among members of particular groups. Previous cultural influences such as economic structures, forces of oppression, religious texts, and conflict have influenced the form and function of literacy (Leu & Kinzer, 2000). Leu (2000) asserted that in a “historical sense, literacy has always been deictic, meaning dependent upon the technologies for literate acts” (n. p.).

Looking back in history, we can watch the form and function of literacy change as societies required. For example, even in the earliest societies, literacy was used to help people keep an inventory of land, livestock, and crops. In the 4th millennium BC, the economic growth of Sumerian society required its citizens to be literate enough to maintain their tax and business records. As Leu and Kinzer (2000) noted, this cultural need was the likely inspiration for the technological development of the cuneiform tablets used as print records. Before the advent of the printing press in medieval Europe, the religious hierarchy reserved literacy, and the resultant reading and interpretation of religious texts, for the elite and powerful. There was no need for the general population to be functionally literate, leaving the interpretation and dissemination of necessary texts to religious leaders (Karchmer, 2001; Leu & Kinzer, 2000).

In Europe, the Reformation began to revert power away from the political elite and back to the people, thus changing the function of literacy yet again. Individuals were

held responsible for their own religious salvation through their reading, understanding, and interpretation of religious texts (Leu & Kinzer, 2000; Mathews, 1976). This religious revolution occurred around the time that Gutenberg invented the printing press, which made the Bible widely available to the general population (Leu & Kinzer, 2000; Karchmer, 2001; Mathews, 1976). These events helped to redefine the purpose of text and to embrace a more inclusive definition of literacy by encouraging a literate society (Leu et al., 2004).

After the advent of the printing press, some political leaders feared the large scale sharing of knowledge that the printing press allowed, and thus attempted to oppress the literate public. In Czarist Russia, for example, oppression led to new, politically charged forms of literacy in the form of secret writings, a system of secret self-publications to help inform the public and fuel the opposition (Leu & Kinzer, 2000). In Colonial America, the power of the printing press was carefully restricted by the governing politics. At the beginning of the political unrest between the colonies and England, the English-appointed Virginia Governor became so distrustful of literate citizens that he banned the use of the printing press in the entire Virginia Colony until 1730. He feared that literacy could fuel disobedience and encourage citizens to join the rebels against the English government (Leu et al., 2004). Even with these attempts at oppression, the technology brought by the printing press allowed print to be accessible by the larger population, thus encouraging more widespread literacy.

Further on, the development of democracy forced a new purpose on literacy. In a Jeffersonian democracy, literacy was critical to the survival of the government, as it required its citizens to be knowledgeable enough to make educated decisions in voting

(Ellis, 1997; Leu & Kinzer, 2000). There was also a new discussion of students as future citizens that prompted a change in the purpose of public education to develop literate citizens that would stay abreast of national affairs (Leu et al., 2004). It was through this widespread distribution of information from the printing press and the new emphasis on public schooling that democracy became sustainable (Mathews, 1976). As the needs of the society changed, so did the definition and function of literacy. As the United States became a more industrialized nation, literacy became defined as a way for workers within a hierarchical society to communicate with one another. Typewriters were created to help share information and communicate from the top down through memos and letters. Typists and stenographers became essential to sharing information within a company in order to optimize production and sales (Leu, 2000).

This brings us to our current definition and purpose of literacy. With the rapid and ever-changing technological advances occurring in our society today, the meaning of being literate is changing just as quickly. By nature, as Leu (2000) argued, literacy is deictic, meaning that as society changes, so does the definition and purpose of literacy. Each change influenced by a new technology requires the mastery of new literacies (Leu, 2000; Leu et al., 2013). Previously, as text was print-based, literacy revolved around books, but now, with newer technologies that are competing with print, being literate has new meaning. With new technologies such as collaborative platforms (ex: Google Docs), social media platforms (ex: Facebook, Twitter, Foursquare, etc.), and mobile apps, being literate has now moved past simple paper and pencil text (Leu et al., 2004; Leu et al., 2013). No one really knows what the future holds, and there is no way to know what being literate will mean tomorrow, which leaves teachers and schools constantly having

to catch up. While there have been many developments in digital technology integration into literacy instruction, literacy in schools is still largely print-based (Karchmer, 2001).

Background of the Problem

The International Reading Association (IRA) declared, “To become fully literate in today’s world, students must become proficient in the new literacies of 21st century technologies” (2003, n.p.). At least two national literacy organizations have identified that the Internet and digital technologies have begun to redefine the fundamentals of literacy (IRA, 2003; NCTE, 2013). The IRA’s position statement identified the need to adapt literacy instruction according to the new needs of our society. It emphasized that literacy educators have “the responsibility to integrate these new literacies into the curriculum to prepare students for successful civic participation in a global environment” (n.p.). It encouraged digital technologies use for teaching and learning, collaboration with peers to share effective strategies for a variety of literacy purposes, as well as for the creation of a literacy curriculum that affords opportunities for collaboration with peers. The NCTE also established a “Framework for 21st Century Curriculum,” in which it emphasized curriculum and instruction strategies that encompass the needs of the 21st century community. It wrote, “Because technology has increased the intensity and complexity of literate environments, the twenty-first century demands that a literate person possess a wide range of abilities and competencies, many literacies” (n.p.). NCTE’s framework states that students need to have the opportunities to work with the different tools of technology, have opportunities to collaborate, obtain and use the skills needed to effectively navigate through the new information system online, and work within the ethical limitations of these new worlds. Outside of literacy, the U.S.

Department of Education developed the National Education Technology Plan (2010) on the premise that technology is now at the core of our everyday lives and learning to utilize it is a necessary skill for the future. The plan emphasizes that technology-based learning is pivotal in improving student learning. Each of these statements addresses the impact technology has on our education system and stresses the need to adapt what we teach and how we teach it.

Hutchison and Reinking (2011) wrote that digital technologies provide unique affordances for reading and writing, and thus require unique skills, strategies, and dispositions that change the course of literacy instruction. These new resources necessitate the development of new literacy skills and allow for new opportunities for advancements within literacy instruction (Karchmer, 2001). Students must have these opportunities to use digital technologies to work together, communicate effectively, and acquire and sift through information in an online environment (Bruce, 1997; Leu & Kinzer, 2000). Ertmer et al. (2012) wrote that to be prepared for the workforce, students must also be provided with opportunities to utilize technology to communicate, collaborate, and solve problems. Leu et al. (2004) warned that failing to integrate digital technologies appropriately into language arts instruction risks leaving today's generation of students unprepared for mainstream reading and writing activities that are increasingly prominent in and out of academic contexts. Since literacy is shaped by and shapes society, we need to look no further than society to see how it influences what happens in schools.

As Shaw (2003) stated:

We live in increasingly complex times, and unless we teach our children how to read about, watch, interpret, understand, and analyze the day's events, we risk raising a generation of civic illiterates, political ignoramuses, and uncritical consumers, vulnerable not only to crackpot ideas, faulty reasoning and putative despots but also to fraudulent sales pitches and mislead advertising claims. (p. H4)

Barriers Limiting Technology Inclusion

Even with this new emphasis on technology inclusion in literacy instruction, it appears that technology adoption by teachers has been a slow process. Many scholars have argued that integration has been minimal or superficial and has not kept pace with developments outside of classrooms and schools, especially in the U.S. (Cuban, 1993, 2003; Karchmer, 2001; Leu, 2006; March, 2003). Cuban (1993) began this discussion early in the technology revolution by pointing out that even with all of the talk about information technology and its impact on culture, computers were used far less in classrooms than in other aspects of our culture. Then, following up a decade later, Cuban (2003) again pointed out that technology adoption in schools has been incredibly slow, and educators continue to be infrequent, limited users of technology for both teaching and learning. Teachers have identified many barriers limiting the incorporation of technology into their lessons (Bauer & Kenton, 2005; Ertmer, 1999, 2005; Ertmer et al., 2012). Ertmer (1999, 2005) and Ertmer et al. (2012) identified and researched two types of barriers. First-order barriers are external to the person and include access, training, and sufficient support. But the underlying second-order barriers, which are internal and include teacher confidence, beliefs, and perceptions of the value of technology in the

teaching and learning process, were thought to pose a greater challenge (Ertmer, 1999, 2005; Ertmer, et al., 2012). From this literature, we can observe that teachers' perceptions about the integration of digital technologies in the classroom are influenced by the education community in which they work. Their co-workers, peers, and administrators create a social context within the school that impacts their individual thinking and eventual adoption of digital technologies for instruction, thus making this a dual-sided problem with both external and internal barriers. In this context, the external barriers (or supports) come from the surrounding community. This community (either supportive or not) can then affect the internal barriers for each teacher by influencing their thinking about digital technologies.

While teachers have often cited first-order barriers as explanations for the lack of technology integration (Ertmer, 1999, 2005), recent data (National Education Technology Plan, 2010) have shown a reduction in the first-order barriers through increased access, improved and more frequent professional development, and increased support. These reductions show first-order barriers are no longer as significant as they once were, leaving researchers an opportunity to gain a deeper understanding of how teachers translate their beliefs into practice (Ertmer et al., 2012). Ertmer et al. (2012) found that the strongest barrier preventing other teachers from using technology was their existing beliefs about technology, as well as their current levels of knowledge and skills.

Teachers' Perceptions and the Impact on Technology Implementation

While teachers' knowledge is important to change, Pajares (1992) noted that their beliefs have a greater impact on their eventual implementation. Teachers' perceptions and beliefs have frequently been identified as connected to the extent to which they integrate

digital technologies into their instruction (Bruce & Rubin, 1993; Clark and Peterson, 1984; Ertmer, 2005; Windschitl & Sahl, 2002; Zhao et al., 2002). Even if teachers have the knowledge to integrate digital technologies into instruction, they will be less willing to follow through with it if they don't perceive that technology has a place in literacy instruction. Teachers' perceptions concerning teaching/learning, technology, and innovation influence the inclusion of technology in their curriculum (Inan & Loather, 2010; Tondeur, Valcke, & Van Braak, 2008; Zhao et al, 2002). There is ample research suggesting that teachers' beliefs, including their beliefs about their own efficacy integrating technology into instruction (Ertmer & Ottenbreit-Leftwich, 2010), play a predominant role in how they conceptualize and use computer-based technologies in their teaching (Bruce & Rubin, 1993; Ertmer, 2005; Windschitl & Sahl, 2002; Zhao et al., 2002). The more likely it is that teachers are able to see a connection between technology and their content area, the more likely they are to include technology-supported pedagogy (Hughes, Kerr, & Ooms, 2005). As Hutchison and Reinking (2011) noted, if teachers hold a negative perception of integrating digital technologies into instruction, or even a simplistic or basic one, they are not likely to integrate digital technologies for high-level instructional purposes, which is consistent with Hall et al. (2013) and teachers' adoption of innovations more generally. With the research that connects teachers' perceptions and beliefs to integration of digital technologies into their instructional practices, it is necessary to explore their perceptions, especially preservice teachers' perceptions in relation to these new literacies. With literacy teachers being charged to develop all of the mainstream aspects of literacy (Hutchison & Reinking, 2011), including the changing

aspects of new literacies (Leu et al., 2013), knowing and understanding their perspectives will help us gauge the likelihood of implementation as they move into the classroom.

Preservice Teachers' Preparations to Teach with Technology

As technology continues its powerful presence in the general culture of the United States, the same rapid rise can be seen in preservice education programs as they put a new emphasis on integrating technology (Kay, 2006). Several education organizations have set expectations that our education systems should be adopting technologies to help prepare our students, including: the International Reading Association (2009); the National Council of Teachers of English (2013); and the National Education Technology Plan (2010). In addition, the Council for the Accreditation of Educator Preparation (CAEP), addresses the need for Teacher Preparation programs to incorporate technology into their coursework expectations: “providers ensure that completers (candidates near completion/within a year of completion) model and apply technology standards as they design, implement and assess learning experiences to engage students and improve learning; and enrich professional practice.” While this expectation is clear, CAEP does not elaborate on this any more in their standards, nor do not they discuss it in regards to any particular subject matter, thus leaving the expectations very general and open for interpretation.

While the expectations to incorporate technology in teacher education programs are clear, just how to incorporate technology into a preservice teachers' program is largely left up to interpretation by each institution. The Educational Technology in Teacher Education Programs for Initial Licensure study reported that 100% of all teacher preparation programs in the United States provided instruction on technology integration

(Kleiner, Thomas, Lewis, & Greene, 2007), but as Kay noted (2006), there is “no consolidated picture on how to effectively introduce technology to preservice teachers” (p. 385). Further, according to Kay, programs across the country have made extensive efforts to create coursework that allows preservice teachers to “implement effective and meaningful uses of technology” (p. 384). Unfortunately though, these strategies are often individual to each program and rarely evaluated. The development of these strategies can also take an extensive amount of time and money, but through their program developments, research has begun to see the patterns of what is being done to include technology into teacher preparation programs (Kay, 2006).

Some of the various strategies being used include the implementation of courses that blend technological skills and technology integration (Algozzine, Antonak, Bateman, Flowers, Gretes, Hughes, & Lambert, 1999), technology skills courses coupled with field experiences (Brush, Glazewski, Rutowski, Berg, Stromfors, Van-Nest, Stock, & Sutton, 2003), project-based courses that emphasize technology integration strategies (Marra, 2004), full curricula that integrate technology across all courses (Brush & Appelman, 2003;), or a combination of multiple approaches (Gronseth, et al., 2014; Kay, 2006), such as the implementation of a single stand-alone course combined with technologically integrated curriculum, or a program that incorporates extensive modeling and integration opportunities.

Digital Natives vs. Digital Immigrants? In the last decade there have been many discussions regarding how the current generation of students may or may not compare to previous generations of students, especially as this new generation has been the first generation to grow up surrounded by technology. This generation of young people has

not known a time without email or the internet, and it has been theorized that because of this exposure, they might have a higher aptitude for these skills than previous generations (Prensky, 2001; Rosen, 2010). In fact, several researchers have created and described several terms to discuss these ideas, such as “digital natives” (Prensky, 2001), “Net Generation” (Tapscott, 1998, 2008) and “Millennials” (Oblinger & Oblinger, 2005). Prensky’s “digital natives” assignment has been the most controversial. Despite criticism by several researchers (Bennett, Maton, & Kervin, 2008; Helsper & Eynon, 2010; Jones, Ramanau, Cross, & Healing, 2010), including the author himself, (Prensky, 2009), current research continues to use the terminology (Kist & Pytash, 2015; Oblinger & Oblinger, 2005). In the end, though, the discussion really comes down to the question of whether the current generation of technologically saturated students differs from previous generations simply based on their exposure to communication technologies at very early ages. Because of their prolific use of technology socially, researchers have assumed that this technology obsession would likely impact how they learn (Kist & Pytash, 2015), but research does not back up these assumptions. While some research has shown this youngest generation to be slightly more technologically savvy (Thompson, 2013), other research shows little to no difference between generations (Margaryan, Littlejohn, & Vojt, 2011; Salajan, Schönwetter, & Cleghorn, 2010). In fact, the general consensus from this research is that because of the varying levels technological competence across generational divides, it is impossible to accurately categorize this entire generation as comprised of one type of technology user (Margaryan, et al., 2011; Salajan, et al., 2010). Jones, Ramanau, Cross and Healing (2010) confirmed this when they investigated possible differences between Millennials and previous generations. They described their

participants as a “collection of minorities” (p. 722). A small minority of students were found to be infrequent technology users, whereas a larger minority of students were extensive technology users with the remaining “collection” falling somewhere between those two extremes. In another study, Margaryan, Littlejohn and Vojt (2011) found that this generation’s use of technology is limited and does not generally fall into the Web 2.0 technologies (such as collaborative applications and virtual worlds). The study did not find evidence supporting the theories that this generation of students adopts different learning styles; instead, their learning styles tend to be more influenced by their instructors, and they appear to conform to more traditional pedagogies with some minor uses of technological tools to deliver content. They suggested that while the calls for change may be necessary, it is “misleading to ground the arguments for such change in students’ shifting patterns of learning and technology use” (p. 429). In the end, their research confirmed that it is not fair to assume that this generation of students possesses any greater technological skill or aptitude than previous generations, which is why it is imperative to explore their perceptions of using these tools in instruction. These students may not come in with greater skills, but perhaps their perceptions of these tools are different from previous generations.

New Literacies Theory

One emerging theory at the intersection of literacy and digital technology is the New Literacies theory (Leu & Kinzer, 2000; Leu et al., 2004; Leu et al., 2013). Over several publications, Leu and colleagues outlined and created this new working theory to acknowledge, and potentially explain, the impact these new technologies are having on our understanding of literacy. Historically, both the form and function of literacy has

reflected the changing social practices and needs of society (Leu, et al., 2013), and as new technologies continue to rapidly evolve, our understanding of literacy must also adapt. It is this rapid change, due in part to advancements in digital technologies that has been challenging. Researchers and theorists are continuously working to create adequate theory that seeks to explain these changes in literacy. In their most current publication, Leu et al. (2013) used the foundational concept that literacy is deictic, or a dual-level theory. This dual-level theory treats new literacies as a flexible umbrella theory holding smaller theories, such as multimodal literacy (Hull & Schultz, 2002) and multiliteracies, (Cope & Kalantzis, 2000; New London Group, 1996) under it. The purpose of using this dual-level theory, they argue, allows for multiple perspectives to work within this umbrella theory of New Literacies. As they write, “When literacy is deictic and multifaceted, a dual-level theory of New Literacies is not only essential but also provides a theoretical advantage over any single-dimension approach to theory building and research” (p. 1158). The central principle of the New Literacies theory is that “the Internet has become this generation’s defining technology for literacy in our global community” (p. 1159).

The Problem of Nomenclature

One of the challenges in studying teachers, or in the case of the present study, preservice teachers, in relationship to some phenomenon is varying terminology used by researchers to capture the personal or presage variables that influence the adoption of that phenomenon. Specifically, this relates to determining whether one is studying teachers’ perceptions or teachers’ beliefs. Most notably, Ertmer’s work revolves around teachers’ beliefs (Ertmer, 1999; 2005; Ertmer, et al., 2012; Ertmer & Ottenbreit-Leftwich, 2010),

as well as work done by Pajares (1992), who has argued that the differences in these two presage characteristics are not particularly clear in the literature. Other researchers, such as Hutchison and Reinking (2011), Al-Hazza and Lucking (2012), and Inan and Loather (2010), predominantly use the terminology of teachers' perceptions. For the purpose of this study, teachers' perceptions best represents its intent and research questions.

Problem Statement

As the intersection of new literacies and digital technologies is very new, there are several problems with regard to the implementation and research behind it. It is challenging to generate new knowledge when the nature of literacy changes faster than can be articulated and developed (Leu et al., 2013). Research struggles, therefore, to stay abreast of advancements in digital technologies and the potential for learning new literacies. The research that has been done on technology in literacy instruction and preservice teachers' perceptions is composed of small-scale qualitative exploratory studies (Burnett, 2011; Connors & Sullivan, 2012; Ertmer et al., 2012; Karchmer, 2001; Kim et al., 2013). These studies explore what teachers are doing and how they are implementing these strategies into their literacy instruction (Coiro & Dobler, 2007; Katić, 2008; Wolsey & Grisham, 2007). Even though there is useful work on practicing teachers, there are few studies exploring preservice teachers' perceptions (Burnett, 2011; Chen, 2010; Eyyam, et al., 2011; Gialamas & Nikolopoulou, 2010; Hsu, 2013; Hughes, 2013; Sang, Valcke, van Braak, & Tondeur, 2010; Tokmak, 2013), and only two specifically discussing digital technologies in literacy instruction (Al-Hazza & Lucking, 2012; Kist & Pytash, 2015). It is now important to understand the perceptions of preservice teachers, as they are the next generation of teachers. Many of these aspiring

teachers may have grown up in this technology-filled society, but they likely did not receive technological instruction as P-12 students; this leads to the research questions that are the focus of the present study.

Research Questions

The purpose of this study is to explore preservice teachers' perceptions of digital technologies in literacy instruction. Specifically, this study aims to answer the questions:

1. What are entering preservice teachers' perceptions of the role of digital technologies in literacy instruction?
2. What conditions do entering preservice teachers anticipate?
 - a. What barriers do they anticipate regarding the use of digital technologies in literacy instruction?
 - b. What facilitators do they anticipate they will need regarding the use of digital technologies in literacy instruction?

Significance

The significance of this study is to help bridge the gap in our understanding of the influence of preservice teachers' perceptions of on their eventual use of digital technologies in literacy instruction. Understanding their perceptions will help us better gauge preservice teachers' perceived role of digital technologies in literacy instruction, and then consider the nature of preservice preparation they will need as they study to become teachers, as well as the professional development they will need in the future.

Chapter Two

In this chapter, the researcher will review existing research on preservice teachers' perceptions of digital technologies use in literacy instruction. The studies reported here are used as a foundation to support the purpose and importance of conducting the current study. This chapter will begin with a brief introduction and discussion of the search criteria used to conduct this literature review, followed by a discussion of the differing terminology used in the related studies. The relevant literature will be discussed next. The studies used in this literature review focus on: (a) inservice teachers' perceptions of digital technologies in literacy instruction; (b) preservice teachers' perceptions of digital technologies for personal learning; (c) preservice teachers' perceptions of digital technologies in general instruction; and (d) preservice teachers' perceptions of digital technologies in literacy instruction. The first section will focus on the different studies done regarding inservice teachers' perceptions to gain an idea of the findings from studies related to inservice teachers. By introducing the inservice literature first, the researcher aims to go from the topic where most of the research on teachers' perceptions of digital technologies has been conducted and then will turn to preservice teachers' perceptions of digital technologies use in literacy instruction. The next main section focuses on preservice teachers' perceptions. This section is broken into three categories, going from the most broad (perceptions of digital technologies for personal learning) down to the most narrow (perceptions of digital

technologies in literacy instruction). This chapter concludes with a discussion of the limitations from the existing research, further providing support for conducting this current study.

Search Criteria

When beginning the search for any related studies, it quickly became clear that this research area has a major gap in literature. There are a few studies exploring inservice teachers' perceptions of digital technologies in literacy instruction (Cviko, McKenny, & Voogt, 2012; Hutchison & Reinking, 2011; Karchmer, 2002; McIntyre, 2011), and there are fewer studies of preservice teachers' perceptions. To date, only two studies have specifically explored preservice teachers' perceptions of digital technologies in literacy instruction (Al-Hazza & Lucking, 2012; Kist & Pytash, 2015); so it became clear that this literature research needed to be broadened to explore surrounding research areas. In addition to exploring inservice and preservice teachers' perceptions of digital technologies in literacy instruction, the study expanded into literature that discussed preservice teachers' perceptions of digital technologies more generally. To provide support for this study, I explored a broad range of literature that examined preservice teachers' perceptions of digital technologies for their own personal learning, as well as preservice teachers' perceptions of digital technologies for general instruction.

The search criteria for this study included books, book chapters, peer-reviewed journals and dissertations. When conducting my search, I utilized major education and literature databases including ProQuest, JSTOR, Education Research Complete and Science Direct. Terms used included: "new literacies," "digital literacy," "preservice teachers perceptions," "digital technology," "literacy + technology," "preservice

perceptions + technology,” “ICT + literacy,” “perceptions + technology + literacy,” “teacher perceptions + ICT,” “technology + literacy instruction,” “digital technologies + literacy.” Due to the ever-evolving nature of this topic, the majority of this search focused on literature published within the last five years, but the search was expanded to the last fifteen years to include any early studies focusing on this topic.

The Problem of Nomenclature

As discussed in Chapter 1, one of the biggest challenges with this research topic is the different terminology used within the relevant research studies. Many words are used to discuss this topic, such as perceptions (Al-Hazza & Lucking, 2012; Baltac-Göktalay & Özdilek, 2010; Burnett, 2011; Cviko et al., 2012; Eyyam, Menevis, & Dogruer, 2011; Goktas & Demirel, 2012; Hutchison & Reinking, 2011; Karchmer, 2001; Kist & Pytash, 2015; Larson, 2013; Martinovic & Zhang, 2012), beliefs (Hsu, 2013; McIntyre, 2011), attitudes (Sang, et al., 2010), views (Gialamas & Nikolopoulou, 2010), and positioning (Hughes, 2013). While they may be using different terms, each of the studies used in this literature review relate to the body of literature germane to literacy. To retain the integrity of previous researchers’ work, their chosen term will be used in the discussion of their work. For the purpose of this research study, “perceptions” has been chosen to represent the intent of the researcher.

A similar situation occurs when discussing “technology” in relation to the search procedure for this study. Technology is often considered a generic term that encompasses many different ideas. Throughout the literature, researchers use many different terms to discuss similar ideas. There are several examples of this in the literature search for this study, such as technology (Cviko et al., 2012; Hsu, 2013; McIntyre, 2011), Web 2.0

(Baltac-Göktalay & Özdilek, 2010; Eyyam, et al., 2011; Kumar & Vigil, 2011), New Literacies (Kist & Pytash, 2015); the Internet (Karchmer, 2001), New Technologies (Al-Hazza & Lucking, 2012), and Information Communication Technologies (digital technologies) (Burnett, 2011; Gialamas & Nikolopoulou, 2010; Goktas & Demirel, 2012; Hutchison & Reinking, 2011; Martinovic & Zhang, 2012; Sang et al., 2010). Other researchers are exploring a specific aspect of technology, such as eBooks (Larson, 2013) and a “laptop infused curriculum” (Hughes, 2013). All of these terms were used in the literature search for this topic. Initially, for the purpose of this research, “Information Communication Technologies” (ICTs) was chosen to represent the intent of this study, but by the completion of the data analysis, it seemed this term had already become outdated as new literature coming out (Hutchison & Colwell, 2015) was now using digital technologies. Upon further analysis, it was determined that the term “digital technologies” completely represented what the previous term “ICTs” represented but in a much more user friendly and acceptable format, so for those purposes “digital technologies” was chosen to represent this research.

Studies of Teachers’ Perceptions of Digital Technologies in Literacy Instruction

When exploring the literature related to preservice and inservice teachers’ perceptions of digital technologies in instruction, inservice teachers’ perceptions comprise a much more substantial body of literature. While inservice and preservice teachers’ perceptions may vary due to the differences in experience and education, they are still related and should be explored. To provide further support for the proposed study, this section reports on research that lends insight into how inservice teachers’ perceive the use of digital technologies in literacy instruction. The studies reported in this

section are often two-fold. First, they aim to discuss inservice teachers' perceptions of digital technologies in literacy instruction, but a few studies (Hutchison & Reinking, 2011; Karchmer, 2001; McIntyre, 2011) also take the study a step further to explore their implementation of digital technologies in their literacy instruction. By allowing for this second dynamic, they can also explore the connection between perceptions and implementation that is not obtainable when exploring preservice teachers.

In an early study of practicing teachers, Karchmer (2001), explored 13 K-12 teachers' perceptions of how the Internet influenced their literacy instruction. These 13 participants were purposefully chosen as exemplary technology users. Karchmer conducted a qualitative study using mostly self-reported data from the participants. Semi-structured interviews and reflective journals were used to obtain the teachers' perceptions. The semi-structured interviews were conducted via email partly because of geographical distances, but also because they allowed the participants to consider their responses thoroughly before replying. In addition, the reflective journals were also utilized to collect reflections and thoughts from the participants and were submitted electronically to the researcher. The teachers considered the literacy in their classroom to be simply reading and writing, and referenced the Internet's influence as merely an extension of their traditional literacy instruction. They also reported varying views of the Internet's impact on literacy instruction. Some of the elementary level teachers voiced concerns regarding the reading levels and appropriateness of online materials, whereas secondary teachers did not feel as though this was a concern. Interestingly, the elementary teachers noticed an increase in their students' motivation to write when they knew that their work would be published online for a larger audience. Karchmer reports

that most of these teachers also reported encouraging technology-based literacy skills that would be necessary for the workplace. Also interesting was that despite Leu, Kinzer, Coiro, and Cammack's (2004) view that technology has changed the definition of literacy, these teachers did not express this view at the time of Karchmer's study. Instead of seeing technology as a change factor for literacy, they simply saw and used technology in the same format they would if it were print based. These teachers did not see a difference in the instruction related to using electronic textual aids versus print instruction. While these views are positive, there are several factors to consider. First, this study was published in 2001; at this point, it is 14 years old. In this age of rapidly changing technology and technology experiences, it may be challenging to compare technology users in 2001 to technology users today as digital technologies are much more prevalent. Second, this study purposefully used teachers who were considered exemplary in their use of technology in literacy instruction. While their views are powerful and important, they do not represent the general population of literacy instructors, especially at the time of Karchmer's study. As this study was conducted over a decade ago, it is most important to consider this study a piece that adds to the foundation of research from which future studies have grown.

Unlike Karchmer's (2001) study that focused on the views of the expert teachers, Hutchison and Reinking (2011) conducted a national survey aimed to get a broader view across the nation of what literacy teachers perceive specifically about ICTs (their preferred expression) in their literacy instruction. To date, this was the first and only study to explore a large-scale view of literacy teachers' perceptions of ICTs in literacy instruction. This study used a mixed-methods online survey that included 69 items on a

Likert-scale, 11 multiple choice questions, and eight open-ended questions. The survey included the availability and use of ICTs in their instructional settings, their perceived obstacles, and their beliefs about the importance of integrating ICTs into their literacy instruction. The survey was distributed across most of the nation, and in the end there were 1,441 useable surveys from the national response. That number represented approximately 2% of the total subpopulation of literacy instructors. The results indicated that fewer than half of the respondents reported that overall access to ICTs is a problem. They also revealed that “many teachers conceptualize integration of technology as an extra component, rather than a curricular component” (p. 323). For example, teachers saw replacing traditional tools, such as a print text, with online digital books as a means of integrating technology in their classrooms. Their respondents did not see technology as a transformative agent that would allow instruction to move to a higher level of interaction and collaboration. They also reported that virtually all participants indicated that technology should be integrated, but two-thirds of those respondents only viewed technology as a supplemental role. Overall, the teachers reported that technology integration was important and they indicated that literacy instruction needed to address digital forms of reading and writing, but few were actually following through with implementation. The teachers also noted various obstacles, but they did not indicate that those obstacles were overwhelming, suggesting that if they wanted to surpass the obstacles, they could, but chose not to. Lastly, while the teachers expressed a need for professional development, ironically many of them also indicated confidence in their ability to integrate ICTs into instruction. Unfortunately, as this study relied heavily on the implementation piece of the data, it is not directly relatable to preservice education, but it

does help obtain data in an area previously lacking research analysis. This important study serves as a benchmark to help determine progress toward increasing technology integration into literacy instruction and an aid to determine where teacher education and professional development programs can go from there.

Also exploring teachers' beliefs regarding the role of technology in literacy instruction, McIntyre (2011) conducted a smaller scale mixed methods study exploring those beliefs. The study was conducted in a technology-rich elementary school and aimed to investigate the beliefs teachers held regarding instructional technology and the degree to which those beliefs were enacted in practice. A survey, *Technology Integration in the Classroom*, was first used to establish an overall pattern of teacher's beliefs regarding technology in instruction across the school, as well as their reported implementation of technology. The survey included 21 teachers from a technology rich elementary school. The survey data revealed that the majority held positive attitudes towards technology integration and the importance of technological literacy for their students. While most teachers indicated they used technology in their instruction, they also indicated they had a vague idea of technology integration. Those data were then used to inform the qualitative open-ended questions and case studies of three purposefully chosen literacy teachers of varying levels of technology implementation. The analysis of data was conducted through single case and cross-case analysis to find each individual teacher's perspectives as well as to identify any themes occurring across the participants. The findings revealed that the three case study participants believed that technology played multiple roles in their literacy instruction. They indicated that technology allowed them to enact their existing pedagogical beliefs in their instruction. For example, one participant held a student-

centered pedagogical belief and used digital technologies to implement multiple teaching methods, flexible grouping and non-traditional texts, thereby allowing her to enact her pedagogical beliefs with increased efficiency. The teachers also indicated in the case study interviews that technology was a tool to make classroom instruction more efficient and a tool to help make their literacy instruction more effective for the students. These findings suggest that technology use in literacy instruction was influenced by: (a) their pedagogical beliefs; (b) perceived administrative support; (c) the amount and type of professional development available; (d) the ease of access to working technology; (e) the teachers' perceived barriers to technology integration; and (f) the teachers' attitudes toward technology integration. While this study is small scale, this data adds to the growing base of knowledge regarding teacher's perceptions of technology in literacy, and tells us that there are several factors, such as pedagogical beliefs, support, access, knowledge and attitudes, that all need to be considered in order to understand how and why teachers implement technology in their instruction.

Also exploring teachers' perceptions, Cviko, McKenny, and Voogt (2012) researched the integration of a technology-rich emergent literacy curriculum, PictoPal, and its impact on their perceptions about teaching and learning with technology and with technology-based innovations. This study was conducted as a quasi-experimental case study to examine whether teachers' perceptions of a technology-rich emergent literacy curriculum affected technology integration, which would in turn affect student achievement. Four early childhood classrooms comprised of 95 students served as the experimental groups using PictoPal, while two other schools within the same district ($n=73$) agreed to function as the control groups. Data were collected through semi-

structured interviews with the teachers, an observation checklist, and an emergent literacy test for the students. The qualitative data, which included interviews and observations, were cross-analyzed, and themes were explored across the participants. Specifically, the semi-structured interviews were used to explore the participants' visions about teaching and learning; their attitudes and expectations regarding technology use; and their perceptions of their own technological knowledge and their willingness to learn the technology. The quantitative data were analyzed using an ANOVA on the observation checklist and an ANCOVA with the pupil learning measure as the dependent variable. The ANOVA was used to compare the differences in student engagement in observed computer activity in the two conditions. It revealed a significant difference between the two conditions: $F(3, 28) = 3.511, p < .05, \eta^2 = .27$. The ANCOVA estimated differences in pupil learning in the two conditions; it revealed a significant difference in favor of the experimental group $F(1, 159) = 14.508, p < .05, \eta^2 = .08$. The learning gains of the pupils in the experimental group $M = 2.93, SD = 2.23$ were significantly higher than the learning gains of the pupils in the control group $M = 1.63, SD = 2.74$. These findings suggested that the teachers' perceptions about teaching and learning, technology, and innovations are related to the way in which teachers enacted the PictoPal. The researchers concluded that a "developmental approach to teaching, perceiving technology as a tool to support learning, positive expectations towards implementation of innovations, confidence in technology skills and perceiving support from administration were all related to a high extent of technology integration" (p. 49). From their findings, the researchers also suggested that teachers who perceive their roles as active agents in helping their students construct meaning in their learning processes enact more

technology-rich activities than teachers who see their roles as more passive facilitators of learning. The teachers who take active roles in their students' learning processes were found to "participate in children's activities (play) with computer generated products to encourage and enhance pupil use of literary products and related language" (p. 49). This study showed a positive relationship between teachers' perception and technology integration. This study also indicated that a facilitative approach to teaching along with at least moderate use of technology led to significant student learning gains, showing that pedagogical decisions possibly play a role in student learning. This study suggests a conundrum that technology inclusion alone is not sufficient to achieve student gains; rather, teachers must have the knowledge necessary to make appropriate instructional decisions in including technology in order to influence student achievement.

Overall, these four studies allowed for a broad look at inservice teachers' perceptions of digital technologies in literacy instruction. While each explored teachers' perceptions, their populations vary from one another. Karchmer (2001) conducted a small study with technologically-exemplary literacy teachers, Hutchison and Reinking (2011) completed a large national study and had a small response rate, McIntyre (2011) studied one technology rich environment, and Cviko, et al (2012) conducted a quasi-experimental study focusing the effect a technology rich literacy curriculum had on teachers' perceptions and student achievement. The perceptions reported in each study vary as the populations vary. Karchmer's (2001) exemplary participants had strong positive perceptions. Cviko et al., (2012), Hutchison and Reinking (2011), and McIntyre (2011) each also reported positive, but relatively weaker perceptions overall. Another theme across all of the studies was the existence of barriers limiting implementation. Just as the

participants varied, the degree and amount of barriers varied across these studies as well. While these investigations had some rather promising findings, this area of teachers' perceptions of the affordances of digital technologies in literacy instruction still lacks enough research to provide definitive directions for teacher preparation. As a result, further research needs to be conducted to continue to explore inservice teachers' perceptions of digital technologies in literacy instruction.

Studies of Preservice Teachers' Perceptions

Studies investigating teachers' perceptions of technology inclusion in literacy instruction are limited, but even more limited are studies examining preservice teachers' perceptions of technology inclusion in literacy instruction. When exploring the related literature, it was noticeable that the large majority of the researchers examined preservice teachers' perceptions of using digital technologies for their own personal learning (Baltac-Göktalay & Özdilek, 2010; Kumar & Vigil, 2011), with some focusing on their perceptions of digital technologies usage for personal learning specifically within their teacher education programs (Burnett, 2011; Eyyam, et al., 2011; Goktas & Demirel, 2012; Larson, 2013; Martinovic & Zhang, 2012). In the minority, a few researchers explored preservice teachers' perceptions with regard to their future use of digital technologies in their teaching (Chen, 2010; Eyyam, et al., 2011; Gialamas & Nikolopoulou, 2010; Hughes, 2013; Sang, et al., 2010). Lastly, in the literature search, only two studies have been found that look at preservice teachers' perceptions of using digital technologies in literacy instruction (Al-Hazza & Lucking, 2012; Kist & Pytash, 2015). In an effort to understand the literature on preservice teachers' perceptions of digital technologies, this literature will be broken down into three categories: (1)

preservice teachers' perceptions on digital technologies for their own personal learning; (2) preservice teachers' perceptions on using digital technologies for general instruction; and (3) preservice teachers' perspectives on using digital technologies in literacy instruction.

Using Digital Technologies for Personal Learning

Several researchers have studied preservice teachers' perceptions of digital technologies use with regard to their own personal learning (Baltac-Göktalay & Özdilek, 2010; Goktas & Demirel, 2012; Larson, 2013; Martinovic & Zhang, 2012). While these studies did not discuss the preservice teachers' perceptions towards digital technologies for instructional purposes, this information is still an important first step in understanding their perceptions regarding digital technologies use.

Using Web 2.0 tools. As technology continues to advance, many teachers are finding ways to integrate the more interactive pieces of digital technologies. Often known as Web 2.0 tools, these include blogs, wikis and social media. Some researchers have been exploring preservice teachers' perspectives of using these forms of digital technologies for personal and/or education use (Baltac-Göktalay & Özdilek, 2010; Eyyam, et al., 2011; Kumar & Vigil, 2011). For example, Baltac-Göktalay & Özdilek (2010) explored preservice teachers' perceptions about using Web 2.0 tools in their own personal learning process, as well as their acceptance levels and attitudes towards these tools. By surveying 101 first-year preservice teachers with a Web 2.0 attitude scale and the Unified Theory of Acceptance and Use of Technology (UTAUT) tool, they found that the participants' perceptions about Web 2.0 tools were positive and their acceptance and willingness to use them for their own learning was high. A majority of the participants

(62%) indicated that they intend to use Web 2.0 tools at some point during their teacher preparation coursework. They also found that these preservice teachers generally had access to adequate technology tools and they often chose to use them in their own lives. For example, the participants indicated that they were occasional to constant users of instant messaging (77%), Skype (66%), and social media (61%). They also reported that their comfort level with Web 2.0 tools was high, especially with regard to using instant messaging (88%), social networking (80%), and Skype (80%). While these results are important for providing a base of research regarding preservice teachers' perceptions of digital technologies, this study focused on their perceptions of these tools for their own personal learning. There are no discussions regarding the students' perceptions of using these tools in future instruction. In the end, the authors concluded that even though learners preferred using the audio-visual technologies over other technologies because they were more comfortable, they still indicate a willingness to use Web 2.0 tools for their own learning.

Also looking at Web 2.0 tools, Kumar and Vigil (2011) studied preservice teachers' uses of Web 2.0 tools for both personal and educational use. Using a survey, they explored the Web 2.0 uses of 54 preservice teachers in both informal and formal educational settings. Their survey collected the preservice teachers' experiences with Web 2.0 tools for both informal personal use and formal educational use. Their results showed that preservice teachers most frequently used social networking tools, such as Facebook, MySpace, Twitter, and online videos, such as YouTube, for informal personal uses. The participants also showed some familiarity with wikis, blogs and podcasts, but had little knowledge of social bookmarking tools such as Delicious and diigo. In contrast,

the only tools the preservice teachers used more for educational purposes were online discussion forums, such as Blackboard and blogs. For educational purposes, it was found that participants frequently used social networking, such as Facebook groups or Twitter feeds, and online collaborative editing techniques, such as GoogleDocs, with their classmates without the suggestion or requirement of the instructor. This showed that they were able to transfer their personal use of certain tools into educational purposes.

Unfortunately, outside of these types of social networking and collaborative editing tools, these preservice teachers indicated little transfer of their high levels of personal use, such as using podcasts, wikis and blogs, into their education. In other words, even though these preservice teachers were avid personal users, they rarely indicated using these skills in educational environments. These results showed a divide between preservice teachers' personal and educational uses of Web 2.0 tools. Kumar and Vigil concluded that their results suggested that teacher education programs must give preservice teachers more opportunities to see Web 2.0 tools modeled for instructional purposes, and they must allow preservice teachers to utilize these tools for educational purposes. Just because many of the preservice teachers are avid social users does not mean they make the connection to educational use or even further to instructional use without being given academic reasons for doing so.

Lastly, Eyyam, Menevis, and Dogruer, (2011) also explored the perceptions of preservice teachers regarding using Web 2.0 applications. They observed that many of their students were using different Web 2.0 applications and were beginning to increase their technology competence while other students still continued to struggle with these ever-changing technologies. It was because of this division that they explored the

perceptions of the teacher candidates in their Educational Sciences program. This study included 152 participants across all four years of their program, with the majority ($n = 128$) being upperclassmen (juniors and seniors). This study included two instruments, the first was a demographic survey used to collect variables such as their age, gender, hometown, department and their year at the university. The second instrument was the 'Web 2.0 Attitude Scale' (Baltac-Göktalay & Özdilek, 2010). This scale consisted of several sections regarding the frequency of use, appropriateness of use, and the effectiveness of use in their educational program. The results showed the majority of their preservice teachers were proficient in several areas of Web 2.0 applications. For example, 68% ($n = 103$) of the participants were proficient in Instant Messaging Software and 62% ($n = 94$) were indicated they were proficient in using Social Networking Sites. Also, 60% ($n = 92$) indicated being proficient at audio or video sharing programs. The results also indicated that there were several types of Web 2.0 tools that were underutilized. For example, 67% indicated that they did not use Social bookmarking sites, and 64% did not use or read blogs. The first half of this study shows that the current preservice teachers are active users for social and educational purposes.

Blogs are one aspect of Web 2.0 tools that are finding their ways into education practices; they are often used in preservice education courses as sources for online writing. In an effort to examine the degree to which preservice teachers were making connections between their use of blogs as students and their future use of them for instructional purposes, Goktas and Demirel (2012) studied the effects of a blog-enhanced ICT course on the preservice teachers' perceived ICT competencies and their perceptions of the blog-enhanced ICT courses. The courses are two undergraduate ICT courses

(Computer I and Computer II) in the Primary Social Science Teacher Training Department at Ataturk University, Turkey. In this descriptive case study, the researchers used a questionnaire, face-to-face interviews, and focus group interviews to collect data. Over a three-year time period, the researchers collected a total of 339 responses from first-year preservice teachers. The researchers found that most of the participants saw blogs as important tools that helped to positively influence their perceptions of digital technologies. Not only did they perceive blogs as helpful in gaining experiences with digital technologies, but they also indicated that using the blogs in their coursework helped them understand how to use them in their personal lives and their future careers as teachers. The researchers concluded that preservice teachers must be given experiences that allow them to interact with these technologies in order to help them gain the educational connections needed for future implementation.

Digital text. A second category of digital technologies is digital text, which is essentially any traditional print-based text put online, such as e-books. These are often used in education settings because they offer a simple transition from print-based text to electronic texts. Looking specifically at using e-books in a literacy methods course, Larson (2013) studied 49 preservice teachers to explore their perceptions of an e-book experience in an elementary methods course focusing on Literacy instruction in grades 3-6. The objective of this course activity was to help the preservice teachers better understand aspects of digital texts and the potential they hold for affecting children's reading comprehension. As a part of the coursework, the students were assigned one of the novels to read as a young-adult e-book; this provided first-hand experience with learning and teaching using an e-book. Upon the conclusion of the course, the preservice

teachers were given a post-reading questionnaire inquiring into their perceptions of their e-book experiences, its potential impact for their reading comprehension, and their perspective for its potential for use in instruction in their teaching careers. The participants had varying opinions about their experiences using this e-book. Fifty-three percent of the preservice teachers felt that reading an e-book facilitated their reading comprehension compared to reading a print text. On the flip side, 16% of the preservice teachers felt that using an e-book hindered their reading comprehension, and 31% were ambivalent in that they felt that using an e-book neither facilitated nor hindered their reading comprehension. When asked to identify which version they would choose to read (e-book vs. print text), 65% of the preservice teachers reported that they would choose a print copy. While they reported appreciating the advantages an e-book holds over a print version, they reported missing the familiarity of print text. On the other hand, in previous research Larson (2007) found that children did see a division between print and digital text. Speaking to the preservice teachers, Larson concluded that it is important to “not let strong personal preferences interfere with their willingness to provide students with both new and traditional literacy experiences” (p. 288). These findings are important because they add to the challenge of incorporating more digital technologies into literacy instruction. Even though many of Larson’s participants indicated a preference for print-based text, they all acknowledged that digital reading is important and, no matter what their preferences are, it is important to begin integrating it into the curriculum.

Using digital technologies in teacher education programs. Lastly, in a program evaluation of their teacher education program, Martinovic and Zhang (2012) explore preservice teachers’ perceptions of their own ICT experiences in their teacher education

program, as well as their attitudes toward learning with digital technologies. Over two years, the exploratory research study included a total of 87 participants, with 23 participating in the first year, and 64 participating in the second year. Using an online questionnaire, as well as some small focus group interviews, they inquired into the preservice teachers' prior experiences with digital technologies, as well as their experiences with them in their coursework, and their perceptions of those experiences. The online questionnaire included 24 items that explored their self-perceived ICT skills as well their expectations of the ICT instructional experiences and knowledge they would gain through the teacher education program. The preservice teachers were asked to rate their self-perceived ICT skills on a scale of 1 (novice) to 5 (advanced). The results indicated that the preservice teachers "appeared self-confident and well-prepared for using digital technologies" (p. 467) in their teacher education program. The results also indicated that the preservice teachers' skills significantly improved throughout the program, though not enough to move them to the next level of self-perceived expertise. The researchers were also concerned with the divide between preservice teachers' perceptions of digital technologies usage in schools and the actual digital technologies. With their knowledge of the current conditions in schools, the lack of access to digital technologies, and the related professional development hurdles, the researchers concluded that their preservice teachers might be entering into their teaching experiences with an unrealistic picture of the school realities they will likely face in their future teaching experiences. Most importantly, the overall conclusion of this study was that the next generation of teachers are entering into teacher education programs with increasing digital technologies knowledge and skills, and teacher education programs need to make

every effort to give preservice teachers the modeling and instruction needed to effectively implement digital technologies into their future instruction.

Given that these studies are all relatively recent (2010-2013), it is especially interesting that their results discuss varying preservice teachers' perceptions. While each of these studies explores very different aspects of preservice teachers' education, they all explore their perceptions of using these technologies for their own personal learning. Amongst the divergences, two main threads appear. First, preservice teachers are increasingly avid users, but that use does not necessarily indicate the possession of knowledge needed for effective transfer into their coursework (Baltac-Göktalay & Özdilek, 2010; Eyyam, et al., 2011; Goktas & Demirel, 2012; Kumar & Vigil, 2011; Martinovic & Zhang, 2012), nor the willingness (Larson, 2013). Also woven throughout these studies was the suggestion by researchers that if these preservice teachers are to be incorporating these technologies into their future teaching, they need to be given many educational experiences that allow them to interact with these tools (pre)professionally. By giving them more opportunities to learn and more examples of instructional uses, it might encourage them to look at these technologies as tools to enhance their future instruction.

Using Digital Technologies for General Instruction

As incoming preservice teachers have begun to use these digital technologies more frequently, it has become important to look past social use and explore their perceptions of digital technologies use in their future instruction. Several research studies have been conducted (Chen, 2010; Eyyam, et al., 2011; Gialamas & Nikolopoulou, 2010; Hsu, 2013; Hughes, 2013; Sang, et al., 2010; Tokmak, 2013) to explore the perceptions

preservice teachers have regarding their future use of digital technologies as teachers. For example, Sang et al. (2010) focused on possible variables as indicators for future digital technologies use in instruction; Burnett (2011) explored the connection between preservice teachers' personal technology use and their perceptions of technology in future instruction; Hughes (2013) explored how prepared the preservice teachers of a teacher education program felt they were to integrate technology in their future teaching; and Gialamas and Nikolopoulou (2010) aimed to focus on early childhood preservice teachers' perceptions. Lastly, Eyyam et al. (2011), Hsu (2013), and Tokmak (2013) focused on preservice teachers' experiences during their teacher education programs, and the impact they had on their perceptions of using technology in their future instruction. Eyyam et al. (2011) explored preservice teachers' perceptions of using Web 2.0 tools in their instruction. Hsu (2013) explored preservice teachers beliefs about technology integration in their future instruction during their student teaching experience. Tokmak (2013) explored how preschool preservice teachers' perceptions about technology integration changed as a result of technology-rich course design.

Future use of digital technologies. Sang, Valcke, van Braak, and Tondeur (2010) explored student teachers' thinking processes and their potential for ICT integration. They were looking for predictors that might indicate preservice teachers' attitudes and thus their later implementation of digital technologies. Variables, including gender, constructivist-teaching beliefs, teaching self-efficacy, and the preservice teachers' attitudes towards computers were explored as potential predictors for later digital technologies use. The participants were primary-level student teachers from four different universities across China. A total of 727 student teachers responded with a 97%

response rate. First, the results revealed that gender was not a predictor of potential digital technologies usage. To explain this, the researchers point out that while computers may still be considered a male-dominated area outside education, with the Chinese requirements of digital technologies usage in schooling, it is “not surprising that gender of student teachers has no direct effect on their prospective digital technologies integration” (p. 108). Preservice teachers’ attitudes toward computer use in education seems to be the strongest indicator of prospective computer use. That is, preservice teachers who had shared more positive attitudes towards computer use in education are more interested in integrating computers in their future instruction. The researchers concluded that “successful ICT integration was clearly connected to the thinking processes of classroom teachers, such as teacher beliefs, teacher efficacies, and teacher attitudes toward ICT” (pg. 109), and that more research must be done to continue to explore the thinking processes of teachers that would allow for more innovative classroom activities.

Hsu (2013) explored preservice teachers’ beliefs about technology integration during their student teaching semester. Hsu studied their beliefs rather than their practices because it was assumed that during their fieldwork experiences, preservice teachers’ practices are led by the cooperating teachers and the climate of their placement school, as well as the university coursework requirements. This was a qualitative case study that used pre- and post- field experience interviews, reviews of documents, and observations. Eight participants were chosen specifically to represent the variation possible among the different site locations and grade levels used during the field experiences. While Hsu examined their beliefs about using technology for instruction, the first research question

was focused on whether and how their beliefs changed as a result of their field experiences. The analysis determined that each of the beliefs of each preservice teachers changed in one of two opposing directions. Interesting, 50% ($n = 4$) of the preservice teachers felt that teachers should limit their technology integration and the other 50% ($n = 4$) felt that teachers should be integrating more technology into their instruction. The first group had previously held moderate to high beliefs that technology should indeed be used in instruction, but following their teaching experiences they changed their view to a more conservative outlook. Instead of imagining a technology-laden classroom, they felt that technology should be used in more purposeful ways to enhance instruction. The second group had also had moderate to high positive beliefs prior to their field experiences, and given their positive field experiences, they were able to uphold and even strengthen their previous positive beliefs. For example, one participant stated: “It makes a big difference of how the students in school and I want to keep them excited about coming to school. It really is important to have something new in the classroom especially technology” (p. 39). Another participant reported seeing technology as a way to empower her first graders and third participant identified the change in her belief being “a little bit deeper” (p. 40).

The second facet of this study examined the impact the practices of the cooperating teachers and the support of peers had on their changing beliefs. The group who felt that technology should be limited were placed in a classroom with a teacher who integrated technology regularly, whereas the group who felt that technology should be used more were placed in classrooms that used little to no technology. Several participants in the second group reported gaining technology integration ideas from their peers, such as other preservice teachers in the same site. So while they may not have had

the technology experiences in their assigned classrooms, they were still gaining enough exposure to technology to change their beliefs about it. While overall the findings are generally positive with no reports of outright negative beliefs, it is interesting to have the opposing change of beliefs from the different groups.

Similarly, Tokmak (2013) examined the changing beliefs of preschool preservice teachers regarding technology integration. As the instructor of a 3-hour stand-alone technology integration course in an early education program, Tokmak explored preservice teachers' perceptions at the beginning of the semester and then once again at the end to see if their views changed after the coursework. The study used a single case study design with 12 preschool preservice teachers. At the start of the semester, all 12 preservice teachers expressed negative beliefs regarding technology use in preschools and felt that technology use in preschool settings had no advantages. Using TPACK (Mishra & Koehler, 2006) as a foundation for the coursework, a technology-rich course was designed that allowed the students many opportunities for hand's-on exploration of these different techniques. Throughout the semester, focus group interviews, open-ended questionnaires, written journals, assignments observations and a software evaluation form were collected as the data sources. The results fell in to three sections: the preservice teacher's beliefs about technology in preschool; any changes in their beliefs throughout the semester; and their opinions about the course design. For the purpose of this literature review, the description will focus on the first two categories of results. From the focus group interviews and the open-ended questionnaires, two reasons emerged that shed light on the negative perceptions expressed: overall, the preservice teachers lacked knowledge about technology and they discussed the idea that at the early childhood stage, students

need to be experiencing tangible materials and manipulatives, and that technology only presents intangible materials. At the end of the course, the preservice teachers reported understanding the importance of knowing their content, capturing students' attention and using technology while designing instructional materials. During the final focus group interviews, the groups agreed that using technology may motivate children to be more engaged during instruction. In the end, Tokmak concluded that the preservice teachers "realized the benefits of technology integration into the preschools" (p. 125). This study suggests that perceptions can change through increased technology experiences alone. While this may be likely to some degree, the ease with which the preservice teachers' changed their views is interesting. This study suggests that the preservice teachers' reportedly gained technology efficacy through the course, which in turn, caused them to change their perceptions regarding using technology in their future instruction. What this report does not describe is exactly how their perceptions changed. While it is important to see the positive changes in their perceptions, further analysis and investigation is needed to take a critical look at just how their perceptions changed to get the full picture.

In the second part of their study, Eyyam, Menevis, and Dogruer (2011) also explored the perceptions of preservice teachers regarding using Web 2.0 application in their instruction. Fifty-six percent of the participants indicated that using Social Networks would increase the interaction between the student and the instructors. They also indicated that using Social Networks increased interactions with other students (52%) and it improved student satisfaction with their lessons *for some of the students* (38%). Participants also indicated that using wikis can increase the level of learning (48%) and their grades (43%). Lastly, the results also showed that forty-five percent (45%) reported

that using Instant Messaging applications increases interactions between students and, for slightly fewer, that it can help them improve their writing skills (41%). In regards to their future teaching, 50% of the participants agreed that they would definitely be using it in their future classes and 55% of indicated that the benefits of using Web 2.0 tools outweighed any disadvantages.

Overall, Eyyam et al. (2011) concluded that the majority of participants had positive attitudes toward using Web 2.0 tools. They also indicated participant interest in using these tools in future classes, despite the fact that they had limited to no information or context about these technologies, nor did they understand how to use them in their teaching. The researchers stressed that if these positive perceptions were guided effectively through the preservice teacher program, these participants may be more likely to use these Web 2.0 tools in their future teaching.

In a program evaluation, Hughes (2013) studied a laptop-infused curriculum in a teacher education program. One hundred and fifteen preservice teachers were surveyed at the point of graduation to explore their positioning towards integrating technology in their future teaching. Several factors that indicated positive positioning toward technology use in instruction included: (a) digital technology self-efficacy; (b) attitudes towards learning technologies; (c) personal technology use; and (d) TPACK knowledge used to discuss future teaching decisions. The results indicated that all graduates held a moderate level of digital technology self-efficacy upon graduation. Graduates in the fall 2009 semester had the highest mean score of 3.15 ($n = 19$, variance = 0.29, $SD = .05$), followed by fall 2008 graduates with a mean score of 3.08 ($n = 37$, variance = 0.31, $SD = 0.55$) and spring 2009 graduates with a mean score of 3.06 ($n = 48$, variance = 0.27, $SD =$

0.52). The participants also reported a strong positive disposition toward learning technologies. The fall 2009 graduates had the highest mean score of 3.35 ($n = 18$, variance = 0.091, $SD = 0.30$) followed by fall 2008 students with a mean score of 3.32 ($n = 40$, variance = 0.15, $SD = 0.39$), and lastly spring 2009 students with a mean score of 3.30 ($n = 48$, variance = 0.16, $SD = 0.39$). Another finding was that these preservice teachers discussed teacher-centric technology uses three times more frequently than student-centric uses, and their low depth of TPACK showed a lack of pedagogical knowledge necessary to implement technology into instruction. Hughes concluded that even though these preservice teachers may have entered with previous technology experiences, they did not necessarily possess the pedagogical knowledge needed to implement these new technologies into their future instruction. Hughes also suggested that teacher education programs need to consider the range of current digital technologies to which their students are exposed, especially content related digital technologies. Another important factor to note regarding this study is that even though it was published in 2013, the data come from the 2008-2009 school year. While five years is typically not a long time in education, in this world of ever-changing digital technologies, these data might be considered rather dated. Even the students' own personal use of digital technologies is considerably different now than it was in 2008, which is an important consideration to make when interpreting these data.

In an effort to explore the social versus educational uses of digital technologies, Burnett (2011) studied preservice teachers' perceptions on their digital practices inside and outside of educational settings. The purpose of this qualitative study was to investigate participants' perceived role of digital literacies in order to understand why

there is a disconnection between personal and educational technology usage. Using a qualitative sociological phenomenology approach, the researchers explored how preservice teachers made sense of their own digital practices within multiple domains. The study required three phases of researcher and participant interaction with seven participants over a seven-month period. Each phase included an interview with each participant. The first interview included discussing a mind-map that each participant created to represent their use of digital texts within their lives; the second interview focused on discussing the participants' experiences of digital texts within teaching; and the third interview examined their perspectives on different areas or aspects of technology that they avoided. The results found three recurring concepts: (1) significance of appropriateness; (2) identity risk; and (3) reflexivity. The results showed the participants used some of the technologies available to them, although they each discussed that technologies such as mobile phones, social networking, and Internet search engines were central to their lives. Burnett concluded that the gaps between learners' and teachers' uses of new technologies may be narrowing as a more tech-savvy generation begins to enter the field of teaching, but their technology experience may be irrelevant if it conflicts with their different teaching identities. Burnett thereby suggested that teacher identity played an important role in closing the divide between preservice teachers' personal and educational uses of digital literacy practices.

Focusing specifically on early-childhood education, Gialamas and Nikolopoulou (2010) conducted a comparative study exploring preservice and inservice teachers' views towards digital technology use. They distributed a questionnaire to 240 practicing and 428 preservice teachers to explore and compare their views and intentions regarding

integrating and using computers in early childhood education. The researchers found that computer self-efficacy, as measured by a one-factor structure from the questionnaire, was found to positively influence teachers' and students' views and intentions, meaning there was a positive connection between a person's computer self-efficacy and her/his curricular implementation of technology. Interestingly the results split between the two populations with the practicing teachers ($M = 3.91, SD = 0.54$) expressing statistically significant more positive views and intentions than the preservice teachers ($M = 3.51, SD = 0.61$), and the preservice teachers ($M = 2.65, SD = 0.54$) reporting a significantly higher level of computer self-efficacy than the practicing teachers ($M = 2.24, SD = 0.61$).

Looking for some common themes across these six studies is challenging because while they are all exploring preservice teachers' perceptions of using digital technologies in instruction, they are all very different from one another, as is typical of an emerging field. The most common theme across these studies is that which emphasizes the importance the teacher education program can have on a preservice teacher's perception and his or her future implementation. For example, Tokmak's (2013) study showed us that it is possible to influence or potentially even change negative perceptions through increased technology experiences in a teacher education program. Eyyam et al. (2011) also emphasized that proper guidance through teacher education programs is imperative to give preservice teachers the context they need to understand how to use digital technologies in instruction. The findings from Hughes' (2013) study also emphasized that while preservice teachers often enter their programs with technology skills, they do not necessarily know how to teach with them. It is imperative that our teacher education program address this issue.

Hsu's (2013) study also explored the impact of teacher education programs on preservice teachers' perceptions, but the findings from this study are a bit more complicated. Hsu found that the beliefs of preservice teachers changed in one of two opposing directions. The participants in the classrooms with frequent technology experiences reported feeling that technology usage should be limited, while the preservice teachers in the classrooms with little to no technology usage reported wanting teachers to use more. More research needs to be done to explore the differing opinions illustrated by this research study.

Another theme across several of these studies reveals the disconnection between preservice teachers' personal use of technology and their pedagogical knowledge. Our current preservice teachers are personal digital technology users, and many of them hold positive views toward using technology in their future instruction, but this does not mean they hold the pedagogical knowledge necessary to employ digital technologies in instruction. For example, Hughes (2013) found that the preservice teachers he studied held positive views toward technology in their future instruction, but those views were largely teacher-centric (i.e., using digital technologies for organizational and communication purposes). Eyyam et al. (2011) also found that the majority of their participants held positive perceptions, but they also had limited knowledge about how to use them in instruction. Research suggests that we cannot assume that just because these preservice teachers are frequent personal users that they have the pedagogical know-how to implement digital technologies into instruction effectively or that they even envision it as part of their future teaching.

Lastly, two studies (Gialamas & Nikolopoulou, 2010; Sang et al., 2010) had results that differed from the two themes discussed above. Sang et al. (2010) found that preservice teachers who held more positive attitudes towards technology in general also held stronger intentions to incorporate technology in their future instruction. While these results are not groundbreaking, it is important to remember that it is important to explore preservice teachers' perceptions as they enter their teacher education programs in order to determine their educational needs. Also, Gialamas and Nikolopoulou's (2010) study made an interesting comparison of inservice and preservice teachers' perceptions of using technology for instruction. It is even more interesting to see that the results indicated that inservice and preservice teachers' perceptions were opposite what one might expect; inservice teachers expressed more positive views of digital technologies use in education than did preservice teachers. While both found it important, the inservice teachers held a stronger perception.

Only seven studies discuss preservice teachers' perceptions of digital technologies in education; it remains clear that even outside of literacy, this research area is wide open for exploration. Overall, the research area is very limited. There have been only a few studies done looking at preservice teachers' perceptions of using digital technologies in their future instruction, and the results from those studies are hard to compare. Overall, there seem to be two common threads across these studies: teacher education programs are vital to preparing preservice teachers to teach with digital technologies, and although the current generation of preservice teachers are familiar with technology in a personal context, it does not guarantee that they know how to teach with it.

Using Digital Technologies in Literacy Instruction

Lastly, after an exhaustive search, only two studies have been found that look at preservice teachers' perceptions of using digital technologies in literacy instruction (Al-Hazza & Lucking, 2012; Kist & Pytash, 2015). Al-Hazza and Lucking (2012) studied preservice teachers' values and perceptions relative to the way people read, search for information, and react to it through new technologies. Kist and Pytash (2015) wanted to explore the ways preservice teachers might imagine using new literacies within their future literacy instruction. Together, these two studies offer a small, yet important glimpse into this expanding research category.

Al-Hazza and Lucking (2012) examined preservice teachers' electronic media usage, their attitudes and beliefs about these new technologies, and the potential of these forms of technology to enhance their students' literacy development. The data were collected through a 27-item instrument composed of Likert-scale responses. There were 192 participants from undergraduate and graduate preservice education programs at a large mid-Atlantic university. A total of 105 female students and 87 male students participated in the survey. The survey was designed to capture the participants' perceptions of the potential of technological forms of text to impact children's literacy skills by illuminating several "constructs." The "constructs" used in the final survey included: "technology improves students' learning," "aid to social bonding," "learning more because of multitasking," "I feel like a user of technology," "technology and happiness," "aid to young people's literacy skills," "devises impact lifelong love of reading," "technology as an erosion of teacher authority," and "technology and rewiring the brain" (p. 66). Seven of the nine constructs had Cronbach's alpha ranging from .78 to

.91. Two constructs, “technology as an erosion of teacher authority” and “technology and rewiring the brain,” had alpha levels of only .57 and .51, respectively, so they were eliminated (p. 66). In addition, the participants were asked to identify their own technology usage and how they used it in their personal and professional lives. Al-Hazza and Lucking found that while nearly all respondents held positive outlooks on technology use in literacy instruction, there was a significant difference in responses according to gender. Females demonstrated a more positive view of the potential contribution of technology to education than their male counterparts. In addition, the amount of personal technology use showed a strong relationship with the view of potential technology. For example, students who reported a high usage of technology for communicating (i.e.: texting, emailing, etc.) were more inclined to hold positive views of technology in general. When comparing the number of daily texts and emails to their scores on their seven “constructs,” five of them were considered to be statistically significant: “improves student learning” ($r = .81, p = .02$), “aid to bonding” ($r = .84, p = .014$), “technology use brings happiness” ($r = .78, p = .01$), “aid to young people’s literacy skills” ($r = .78, p = .02$) and “impacts lifelong love of reading” ($r = .74, p = .03$) (p. 68). The researchers also found that females were more positive than males about the potential of technology to improve learning for young people, specifically in the area of literacy. With five of the seven correlations being statistically significant to their views of technology, the researchers also suggested that “the more texting and emailing the students did the more inclined they were to hold positive views of the potential of technology” (p. 69). Though the researchers also warned that even though these preservice teachers have heavy technology-using habits, they may hold an unrealistic view of the usage of technology in

education. They suggest that some preservice teachers may see these new electronic forms of print as a “panacea of literacy problems,” and they assume that their students will learn more by staring at a screen while simultaneously being attached to ear buds, thus removing the need for the teacher. In the end, the researchers concluded that just being an avid technology user does not necessarily lead directly to a higher level of understanding of how to best teach literacy skills with technology.

When looking at this study in relation to the proposed study, there are several concerns. First, while this study begins with an emphasis on preservice teachers’ perceptions of digital technologies usage in literacy instruction, the researchers’ interpretation of the findings put a much greater emphasis on the gender gap than a discussion of the preservice teachers’ perceptions. Also, when looking at the seven constructs, only two of them relate to literacy: “aid to young people’s literacy” and “devices impact lifelong love of reading.” While the other constructs used are important, they are more focused on general learning and instruction than on literacy skills. Lastly, with the depth and complexities of applications and tools available with New Literacies, it is somewhat disheartening to see that the only reference to any New Literacies is limited to email, texting, and Twitter messages.

In a recent study, Kist and Pytash (2015) followed junior-year preservice teachers into their field experiences. During the field experiences, the preservice teachers were also enrolled in a course focusing on integrating new literacies into literacy instruction. So the purpose of this study became to explore the preservice teachers’ perceptions of using these new literacies while in the context of their field experiences. Interestingly, prior to conducting this study, the researchers assumed that their results would indicate

more of a disconnection between what these technologically savvy students were seeing in the real world and the lack of technology they might be missing in their field experiences. In the end, however, preservice teachers indicated much more negative views than anticipated.

This study included 28 undergraduate English Education preservice teachers all in their junior year field experiences during the 2010-2011 academic year. The students were all enrolled in literacy methods courses focused on using new literacy methods to teach literacy. In addition to the coursework, a field experience component was included, which allowed the researchers to give their students some real-world experiences within classrooms. Over the academic year, the researchers collected several pieces of data, including blogs maintained as a part of the coursework; semi-structured focus group interviews; two, in-class reflections; and an open-ended questionnaire following the conclusion of their field experiences. Throughout the analysis procedure, several salient themes appeared, including “New Literacies as Somewhat Undesirable in General,” “New Literacies Seen in Service to the Existing Curriculum,” “New Literacies Missing at Hollister High,” and “Defending the Status Quo” (p. 144). It was clear through these themes that there were strong tensions between the vision of literacy instruction being taught in class and the preservice teachers’ actual visions for teaching literacy. Below are some important findings from the themes listed above. In their discussion of “New Literacies as Somewhat Undesirable in General,” preservice teachers implied that they envision giving their students the same personal connections to print books that they gained through their experiences. They made several traditional or “almost nostalgic” comments referencing “old” literacies and disparaging comments about new literacies,

including the idea that technology's displacement of books has had a negative effect on the literacy classroom (p. 147). In discussing ways that new literacies could be beneficial to literacy instruction in "New Literacies Seen in Service to the Existing Curriculum," the participants mainly focused on different ways that new literacies could grab or draw the students to the more traditional existing literacy curriculum. New literacies were seen as motivational tools as well as a way to promote understanding. Preservice teachers also discussed using social networking tools, but their suggestions mostly revolved around using these sites for an online location to store information, such as syllabi or other classroom documents. The third theme discussed in the results, "New Literacies as Missing at Hollister High," revolved around the preservice teacher's discussions regarding the technologies, or lack thereof, used during their field experiences. Even though these preservice teachers expressed mostly ambivalent statements regarding the use of new literacies in their future instruction, they often expressed concerns about the lack of new literacies technologies being used in their field experiences as well as their reasoning about why these new literacies are absent from their site. For example, the preservice teachers often commented on the basic uses of the Internet for teachers and students. Lastly, in the fourth theme, "Defending the *Status Quo*," the preservice teachers often fell back on traditional experiences from their own educations. Statements such as, "I didn't need it to be successful, so why do my students?" were prevalent in their conversations. Other students expressed concern over the experimental status of using these new literacies: with the current high stakes testing environment, they felt it too risky to make any changes to the "accepted" instruction practices. Overall, the researchers determined that from their data, their participants, most of whom would be

considered “digital natives” (Prensky, 2001), struggled with the concept of using these new literacies in their future literacy instruction. They largely perceived new literacy techniques to be burdens that would create extra work rather than tools to innovate instruction. They saw new literacies as potentially being inconveniences and something they would likely have to accept in their future instruction. The most significant finding from this study brings to light the idea that just because we assume that new teachers, who have been surrounded by new technologies the majority of their lives, are more technologically literate, does not mean that they will “automatically bring these new literacies through the schoolroom door in groundbreaking ways, just by virtue of their generational experiences” (p. 156). The researchers conclude that teacher education programs need to make sure that they are not only showing their preservice teachers concrete ways to use these new technologies, but also spending a considerable amount of time on the rationale for using them. While this study paints a dire picture of the negative perceptions of today’s preservice teachers, the researchers question if these perceptions will still be the same in even a few years. As this data was conducted in 2010 and 2011, this study leaves open the idea that these perceptions, perhaps, may change as the school culture begins to change and allows for more adoptions of these new technologies. A change in culture may result in a change in perceptions held by future teachers entering our teacher education programs.

Summary

This comprehensive literature review sought to identify the relevant research related to the study proposed in Chapter 1. The reported studies explored the research topics related to inservice teachers’ perceptions of digital technologies in literacy

instruction and preservice teachers' perceptions of using digital technologies for their own personal learning, in general instruction, and in literacy instruction. Overall, there were fourteen studies explored in this literature, four of which detailed inservice teachers' perceptions of literacy instruction. The remaining eleven discussed preservice teachers' perceptions of using digital technologies in various formats. Across these studies several themes appeared. The most frequent similarity across these studies was the notation of positive perceptions for using digital technologies in education. The majority of the studies (Al-Hazza & Lucking, 2012; Baltac-Göktalay & Özdilek, 2010; Eyyam et al., 2011; Gialamas & Nikolopoulou, 2010; Goktas & Demirel, 2012; Hughes, 2013; Hutchison & Reinking, 2011; Karchmer, 2001; Martinovic & Zhang, 2012; McIntyre, 2011; Sang et al., 2010; Tokmak, 2013) reported that overall, the majority of their participants held positive perceptions for using digital technologies in education. For example, Hutchison and Reinking (2011) reported that "virtually all literacy teachers believe that technology should be integrated into instruction" (p. 324). Eyyam et al. (2011) also found that the majority of their participants held positive perceptions. Goktas and Demirel (2012) also found that using blogging as a tool helped to positively influence the preservice teachers' perceptions. However, there were a few studies (Kist & Pytash, 2015; Larson, 2013) that held more negative perceptions. For example, Kist and Pytash (2015) found that many of their participants "struggled with the concept of using these new literacies in their future literacy instruction" (p. 154) and expressed concerns that these new literacy techniques would be a burden in their future classrooms. In a study exploring the use of iPads for instruction, Larson (2013) also found many of her participants to be resistant to change. Nearly half of her participants reported either being

ambivalent or strongly against using iPads in their future instruction. It is positive to see that the majority of the studies within this area report varying degrees of positive perceptions regarding current or future use of digital technologies in instruction.

Another theme that was seen across several studies was evidence of the impact teacher education programs can have on preservice teachers' knowledge and perception of using digital technologies in their future instruction (Eyyam et al., 2011; Goktas & Demirel, 2012; Hsu, 2013; Kist & Pytash, 2015; Martinovic & Zhang, 2012; Tokmak, 2013). For example, Eyyam et al. (2011) discussed the vital role teacher education programs play in giving preservice teachers the knowledge and experiences they need to understand how to use digital technologies in instruction. Goktas and Demirel (2012) also found that preservice teachers must be given adequate experiences interacting with these new tools in order to gain the understandings they will need for future implementation. Martinovic and Zhang (2012) also stressed that teacher education programs must aim to give preservice teachers the modeling and instruction they need to be able to effectively include digital technologies in their future instruction. Tokmak (2013) also concluded that teacher education programs with frequent technology experiences can influence or even possibly change negative perceptions. Several studies (Al-Hazza & Lucking, 2012; Eyyam, et al., 2011; Hughes, 2013, Kist & Pytash, 2015) also emphasize that it is imperative that teacher education programs address the fact that just because the current population of students, Millennials, are frequent ICT users, they may not understand how to teach with ICT. Several studies cite preservice teachers as frequent users (Eyyam et al., 2011; Kist & Pytash, 2015; Kumar & Vigil, 2011; Martinovic & Zhang, 2013), but that alone is not enough simply assume that they are bringing in the knowledge needed to

know how to make pedagogical decisions with these new tools. Teacher Education programs must take this understanding into account and design their programs to include frequent experiences with digital technologies (Al-Hazza & Lucking, 2012; Eyyam et al., 2011; Hughes, 2013; Kist & Pytash, 2015).

Lastly, as a glimmer of hope for future instruction, several researchers (Hutchison & Reinking, 2011; Karchmer, 2001; Kist & Pytash, 2015; Larson, 2013) found that, regardless of their perceptions, inservice and preservice teachers still see the importance of digital technology inclusion in literacy instruction. For example, participants in Karchmer's (2001) study indicated that using digital technology based literacy skills would be important for their students' future employment. Hutchison and Reinking (2011) also found that, although many participants were not implementing digital technologies in their literacy instruction, most of them did indicate that literacy instruction needs to include digital forms of reading and writing. While there may be several different reasons for their lack of implementation, their perceptions show promise for future implementation. Participants in Kist and Pytash's (2015) study described digital technologies as "necessary evils" (p. 154), but realized that they would be needed in their future instruction. Finally, participants in Larson's (2013) study had varying perceptions, with the majority of them reporting either a negative or a neutral position on using digital technologies in literacy instruction; however, they all "acknowledged that it is time for educators to get on the same (virtual) page and begin integrating digital reading experiences into traditional reading programs" (p. 289). These studies show that regardless of their current perception, many teachers (inservice and preservice) see the need to incorporate digital technologies into literacy instruction.

The studies addressed in this chapter demonstrate the dearth of research on this topic and speak to the need for additional studies that include a deeper exploration of preservice teachers' perceptions of digital technologies in literacy instruction. The current study aimed to gain deeper insight into preservice teachers' perceptions of using digital technologies in literacy instruction. In order to explore this, the researcher conducted semi-structured interviews with several entering preservice teachers. Further details discussing the study are presented in the following chapter.

Chapter Three

The purpose of this qualitative study was to explore entering preservice teachers' perceptions of technology use in literacy instruction. The researcher employed semi-structured interviews to elicit the participants' perceptions of the changing role of technology and its impact on literacy, as well as their intentions toward using technology in their own future literacy instruction. The goal was to provide an insider's perspective, through an emic approach, by participating in and recording these interview discussions (Geertz, 1973).

Because the researcher sought to construct knowledge by exploring the multiple realities perceived by preservice teachers, a qualitative, constructivist approach to the study was most appropriate (Patton, 2002). Each person's perceptions are shaped by his or her individual experiences and cultural influences. Each person's perception is unique, and by exploring the multiple realities, the researcher was able to work toward constructing knowledge.

This chapter will discuss the following methods for this study: (a) design; (b) selection of participants; (c) data collection; (d) data analysis; and (e) limitations.

Through these multiple methods, this study aimed to answer the following questions:

3. What are entering preservice teachers' perceptions of the role of technology in literacy instruction?
4. What conditions do entering preservice teachers anticipate?

- a. What barriers do they anticipate regarding the use of technology in literacy instruction?
- b. What facilitators do they anticipate they will need regarding the use of technology in literacy instruction?

Design

The design for this study allowed the researcher to elicit the perspectives of entering preservice teachers regarding the inclusion of technology within literacy instruction (see Figure 3). Figure 3 represents the design map for this research study. Each aspect of the study, including the goals, theoretical perspective, data credibility, research methods, and research questions, have all been carefully constructed. Figure 3 illustrates how these categories work together to strengthen this research study. This research design map illustrates the five vital components of this study, the research questions, the goals, the methods, the conceptual framework, and the steps taken towards data credibility. As illustrated, these components work together and influence one another. The research questions are also a central guiding focus; they guide the study throughout and are closely connected to each of the five components. The top section of this model, the goals and conceptual framework, are the conceptual elements of this study, and they are a “closely related unit” (Maxwell, 2013, p. 4). The research questions have a clear relationship with the goals of this study in that they inform and are informed by all of the other elements and are grounded in the conceptual framework. The bottom half of the diagram, the methods and data credibility, can be considered the more operational piece of the study. The methods that are employed aim to answer the research questions and the procedures taken to enhance data credibility happen throughout the

methods and aim to support the research questions. In the end, the research questions are the main link between the conceptual and the operational pieces of the research process.

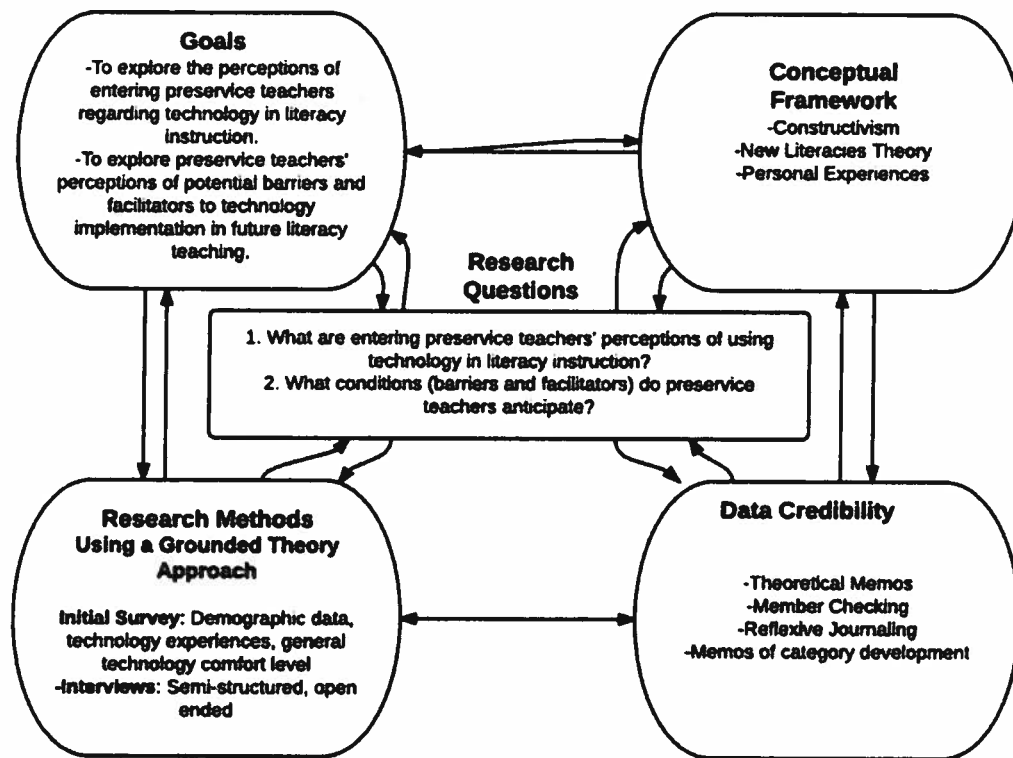


Figure 1. Design Map of Research Methods

Theoretical perspective. This research used a constructivist approach as the theoretical base. The central premise of constructivism is that people (learners) construct new understandings about their reality by actively building upon prior knowledge and experiences (Patton, 2002; Schunk, Meece, & Pintrich, 2012). Researchers using a constructivist lens realize that two people can live simultaneously in the same physical

world, but because of their differing backgrounds, knowledge, and personal perspectives, their realities may greatly differ. Learners create meaning as their own internal representations based upon their realities rather than simply acquiring meaning directly from external sources (Yoders, 2014). For example, each preservice teacher is going to use their own experiences and understandings of technology to create their own perspective of using it for instruction. Using a constructivist approach is particularly helpful in exploring preservice teachers' perceptions of using digital technologies to teach literacy. Preservice teachers are an important group of stakeholders in our educational system, and if they are expected to be teaching literacy with technology, it is imperative to explore their perceptions. By using open-ended interviews, the researcher, a constructivist, attempted to capture these different perceptions and later explore their implications. It is important to realize that there is no "right" or "wrong" understanding, and instead we must explore all of the different realities these preservice teachers may experience. By using a constructivist approach, the researcher aimed to give each participant a voice (Patton, 2002). Using grounded theory within this constructivist study will allow these voices to be collected. The researcher aimed to construct knowledge and develop theories regarding participants' technology use and their shared experience of schooling.

Grounded theory. This research utilized a grounded theory approach (see Figure 4). Grounded theory is "grounded" in the actual data collected and allows for concepts to be developed through the analysis of the data (Glesne, 2011). The purpose of using grounded theory is to focus on the "process of generating theory rather than a particular theoretical content" (Patton, 2002, p. 125). Grounded theory emphasizes using the

constant comparative method and doing theoretical sampling in order to generate theory (Patton, 2002). Glaser and Strauss (1967) point out that “generating a theory from data means that most hypotheses and concepts not only come from the data, but are systematically worked out in relation to the data during the course of the research” (p. 6). The grounded theory approach uses several particular strategies, such as theoretical sampling, constant case comparison and a set coding pattern, particularly Straussian grounded theory (Grbich, 2012). Each of these was used in this study and will be discussed below. Figure 4 illustrates the concept map of research methods chosen to carry out this grounded theory study.

Using ground theory had several benefits to this study. Grounded theory allowed the researcher to better explore a particular human experience. An underlying assumption behind grounded theory presumes that each person’s reality is constructed (Grbich, 2012). As this study aimed to explore the perceptions of beginning preservice teachers, it is important to realize that each of these perceptions was constructed by the experiences and backgrounds of each individual preservice teacher. While their experiences are unique to them, it is essential to look at them as a whole and explore them for potential themes or theories. Using comparative analysis allowed the researcher to compare the perceptions for similarities and differences. Then from those comparisons, it may be possible to generate categories and theories (Glaser & Strauss, 1967). Since grounded theory emphasizes a systematic rigor throughout the entire data collection and data analysis procedure, a researcher can aim at generating theory from these unique perceptions (Patton, 2002). Therefore, while it is imperative to understand that each person’s perceptions are unique, using grounded theory can allow us to look across their

collective ideas for similarities and differences and work toward generating theory (Glaser & Strauss, 1967).

By using grounded theory, the researcher was open to identifying the themes that emerged from the data. This research design allowed the researcher to address the research questions fully and to be open to any additional themes or concepts that arose. By allowing the data to lead the findings and to ultimately create theory, the researcher was able to theorize the understandings of entering preservice teachers' perceptions regarding technology's role in literacy instruction, as well as what factors may influence how they receive their professional instruction in literacy. Using grounded theory as my research method allowed me to explore persistent themes that occurred outside of the original research questions.

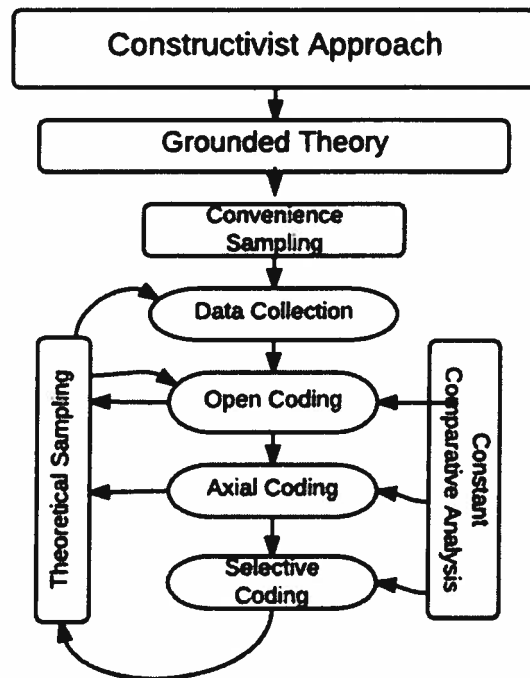


Figure 2. Concept Map of Grounded Theory Methodology

Recruitment Procedures

For this study, five sites were chosen from which to recruit participants. Each site was a mid-Atlantic university that had several licensure programs. Institutional IRB approval was granted at each of these sites (see Appendix B), and Program Coordinators were contacted by email to describe the study and request help identifying the faculty members responsible for the courses in which entering preservice teachers would be enrolled. Four of the five sites agreed to participate, and faculty members from each of the four sites who were instructing courses with first semester education students were contacted. Five faculty members from the four universities agreed to allow me to contact their classes at the start of the semester. There was one face-to-face introduction of the

study and one introduction via Skype. Three faculty members chose to distribute a recruitment flyer to their students on their own. Across the five classes, approximately 90 students were invited to participate. In each of the two live introduction sessions, the researcher introduced herself, the study, and the eligibility requirements. To be eligible to participate, the students had to be enrolled in their first semester of their education program, and they had to be working toward obtaining certificates to teach literacy in some capacity. I also discussed what their participation would look like regarding the interview options, face-to-face or via phone, and the time it was expected to take. For each recruitment session, the researcher concluded the introduction either by distributing a flyer with the survey link or by indicating that the relevant faculty member would be immediately emailing it. The flyer included all of the same information introduced during the recruitment introductions.

The flyer contained a link to a demographic survey (see Appendix X), which was used to gather basic demographic data such as email address, age, enrolled program, and university. The survey also included basic questions regarding personal technology use and comfort level with technology. Each participant scored their level of personal technology usage based on the Likert scale: 1 indicates a low level of personal technology use, and 10 indicates a high level of personal technology use. The participants also rated their personal level of comfort based on the Likert scale: 1 indicates a low level of comfort, and 10 indicates a high level of comfort. The survey also asked participants to choose the applications they were “comfortable using” from a list of different online applications (reading blogs, writing blogs, eBooks, Facebook, Twitter, other social media platforms, photo sharing sites, video sharing sites, wikis, using the Internet for research,

email, and document sharing sites).

Initially, the survey was intended for use as a screening tool to enable me to make an informed decision regarding selective participant sampling with maximum variation. However, because of the small number of participants who agreed to participate, intentional maximum variation sampling was not possible. Therefore, the survey became a tool for collecting simple demographic data as well as initial data regarding each participant's technology use and comfort level. Students interested in participating in the study completed the demographic survey and were subsequently contacted to arrange individual interviews.

Exclusionary criteria. To be eligible to participate, the students had to have been enrolled in their first semester of an education program, and they had to have been working toward obtaining certificates to teach literacy in some capacity in their future classrooms. Only entering preservice teachers were included in order to ascertain their initial perceptions prior to any influence by their teacher education programs and faculty. Only students obtaining certifications to teach literacy were included to ensure the applicability of the research questions to their career paths. Initially, there was an additional exclusionary factor for participation, limiting participants to those who had not had prior teaching experiences. However, upon further consideration, it was determined that the perceptions of these students could not be ignored.

Sites

Of the four sites that agreed to participate, only two of the sites had participants respond to recruitment, Harlan University and Ross University. Harlan University is a public institution with approximately 32,000 students. Its education program is a graduate

level program with several different tracks to licensure within the different programs. There were two programs beginning new cohorts of preservice teachers during the fall semester of 2014. The two programs used for recruitment at Harlan University were the Elementary Education program (master's) and the Secondary Education- English program (master's). Harlan University offers traditional master's in Education courses. The courses used for recruitment in both the Elementary Education program and the Secondary Education program were both literacy methods courses. Both of these courses were taken in the students' first semester in the program. The introduction to this study occurred during the first week of courses.

The second university, Ross University, is also a mid-Atlantic university. Ross University is a nationally recognized private liberal arts university with approximately 4,000 students. Ross University has both undergraduate and graduate education programs. There were two programs that included students who would be certified to teach literacy. The two programs used for recruitment at Ross University were the Teacher Education- Elementary and Middle program and the Teacher Education- Secondary program. At Ross University, these programs are offered at the undergraduate level. During the fall 2014 semester, there was one course with entering students that overlapped between the two programs, a literacy methods course. The introduction to this study occurred during the first week of courses.

The two universities offer different looks at the teacher education population. Harlan University is a large public university with only graduate level education students and Ross University is a small private university with both undergraduate and graduate level education students.

Participants

For this study, the researcher interviewed 10 entering preservice teachers as presented in Table 1. All participants were enrolled in the first semester of a licensure program that will license them to teach literacy at their chosen grade level. Originally, the researcher planned to use 10-15 “information-rich” participants (Patton, 2002), chosen by maximum variation sampling to purposefully select participants across the different variations possible. Unfortunately, purposeful sampling was not possible, as only 10 students responded to the call to participate. Because of this limitation, convenience sampling was used for this study. Glesne (2011) defines convenience sampling as a sampling technique that “selects cases on the basis of convenience” (p. 45). Figure 5 shows the results of the demographic survey. Please note, Aaron’s demographic information is missing because of an issue that occurred during the survey phase. This is discussed in length in his participant description below.

Table 1

Demographic Data

Basic Demographic Information				Participants Indicated (X) which of these applications they are "comfortable using".												
University	Age	Degree/Licensure	Personal Tech Use	Comfort with tech	Reading Blogs	Writing Blogs	e-books	Facebook	Twitter	Other Social Media	Photo sharing sites	Video sharing Sites	Writis <small>for research</small>	Using the internet <small>for research</small>	Email	Document Sharing
Aaron	Ross	20	6-12													
Doug	Harlan	28	6-12	8	9	X	X	X	X	X	X	X	X	X	X	X
Gabby	Ross	19	PK-6	10	7	X	.	X	X	.	.	X	.	X	X	X
Jill	Harlan	42	6-12	7	10	X	X	X	X	X	.	X	.	X	X	X
Lori	Ross	24	6-12	7	5	X	X	X	X	.	.	X	.	X	X	X
Lucy	Harlan	25	PK-6	8	7	X	X	X	X	X	X	X	X	X	X	X
Michelle	Harlan	23	6-12	9	8	X	X	X	X	X	X	X	X	X	X	X
Nina	Ross	20	B-6	7	6	X	.	.	X	X	X	.	.	X	X	X
Reese	Harlan	21	PK-6	10	9	X	X	X	X	X	X	X	.	X	X	X
Sean	Harlan	31	6-12	3	4	X	.	.	X	X	.	X	X	X	X	.

Individual Profile of Each Participant

Aaron. Aaron is a 19-year-old male enrolled in a secondary education program at Ross University. When Aaron filled out the initial demographic survey, he indicated that he had some experiences in the classroom, which was initially an exclusionary factor for participation, so the survey ended without prompting him to answer the remaining questions regarding technology comfort, personal technology use, and the listed technologies that he is comfortable with using. After receiving his partially completed survey, the researcher reevaluated the exclusionary criteria and decided that if this study wanted an accurate picture of the “typical” perspective, then it would be best to include students with experiences teaching in some capacity. After the interview, the researcher attempted to contact Aaron to complete the demographic information, but while he signed the consent form agreeing to participate in the study, he stopped responding to

email requests for additional background information. From Aaron's interview, I was able to ascertain the following about his experiences with technology.

Recalling his K-12 educational experiences with technology, Aaron stated that he remembers teachers using a Smart Board and computers in the library. He also remembers the experiences as being both teacher- and student-driven, as the teachers were instructing as the students were completing activities on the computers. He describes using technology for both personal and educational experiences including "studying, writing papers, and keeping track of schoolwork."

Doug. Doug is a 28-year-old male student enrolled in a secondary education program at Harlan University. Doug is considered a career switcher as he had worked for several years as a paralegal with the intention of going to law school before realizing that he ultimately did not want to become a lawyer. He then chose education as his career path. His survey score for personal technology usage (8) and his survey score for his comfort using technology (9) both indicated a relatively high use of and comfort with technology. Doug indicated that he was familiar with all of the listed technologies (reading blogs, writing blogs, eBooks, Facebook, Twitter, other social media platforms, photo sharing sites, video sharing sites, wikis, using the Internet for research, email, and document sharing sites). Doug mentioned that technology (the Internet, specifically) was just becoming prevalent when he was in school, so it was not relied upon. Doug stated that he did not use very much digital technology in his K-12 learning, except for "random educational games." Doug describes himself as a frequent user of personal technology: "I find it interesting and I try to buy all the new, different stuff." In a previous role as a paralegal, he also described being "put in charge of a website like creating it with Java

um even though I didn't really have any experience doing that." Concerning this experience, he stated: "I immediately feel like I can do stuff, after messing up and Googling around and basically just you know, figuring it out as I go." Although this is a professional use for technology, it does speak to his previous technology experiences. The fact that he felt successful speaks to his positive experiences with technology.

Gabby. Gabby is a 19- year-female student enrolled in an elementary education program at Ross University. Her personal technology use survey score (10) indicated a high level of technology use, but her comfort level survey score (7) indicated only a moderate level of comfort using those technologies. Gabby indicated comfort in seven of the listed applications (reading blogs, eBooks, Facebook, video sharing sites, using the Internet for research, email, and document sharing sites). When asked about her educational experiences with technology Gabby did not remember a time when she did not have technology in her classroom, but her recollection of this technology was relegated solely to computer games and learning about the computer. Gabby discussed frequently cell phone as a constant connection to technology, saying, "I use my cell phone a lot."

Jill. Jill is a 42-year-old female enrolled in a Secondary Education program at Harlan University. Although Jill does not consider herself a career switcher by the "classical definition," she worked as a paralegal for three years and then as a stay-at-home mom for 17 years before deciding to pursue her passion for education. Her personal technology survey score (7) indicated a moderate amount of technology use, while her comfort with technology survey score (10) indicated a high level of comfort. Jill indicated comfort in nine of the listed applications (reading blogs, writing blogs, e-books,

Facebook, Twitter, photo sharing sites, using the Internet for research, email and document sharing sites). In her interview, she discussed being a frequent adopter and having technology in every facet of her life. Since personal computers were still so new while Jill was in school, she does not recall any instructional experiences with technology, although her memory of personal technology experiences are extensive. Her responses include being introduced to a computer at a very early age, watching a dot matrix printer print for the first time, playing Pong on her father's TRS 80 microcomputer, having an electric typewriter in high school, and saving up and buying her first computer with her boyfriend in college. She described having her own personal computer as "the best thing that ever existed." She also stated that she has "never lacked for a piece of technology to help [her]," and her own children have never known a time "where they didn't have a computer, printer, or laptop in the house." When discussing the technology use in her daily life, she described it as "pervasive, it's everything from the time I wake up because my cell phone is my alarm, to the time I got to bed and I play music on my phone to wind down and everything in between." She also mentioned "I'm not afraid of technology, and if it went away, like, I wouldn't know what to do with myself, but I feel like you got to make technology work for you and not you working for technology." Jill also described having her husband, an IT expert, as integral to her adoption of new technologies because "having someone, having an actual technology expert in my home helps [my comfort with technology]."

Lori. Lori is a 24-year-old female enrolled in a Secondary Education program at Ross University. Her personal technology use survey score (7) and her comfort with technology survey score (5) both indicated a moderate level of use and comfort. When

asked about which technologies she was comfortable with using, she chose nine of the listed technologies (reading blogs, writing blogs, e-books, Facebook, photo sharing sites, video sharing sites, using the Internet for research, email and document sharing sites). Lori described her school as being “at the forefront of technology.” Her technology exposure included having a computer class, using Microsoft Word, Excel and PowerPoint, using a Smart Board, and having access to laptop carts. While she discussed exposure to many pieces of technology, she does not remember any particular instructional experiences outside of learning to type. She also mentions, “it’s always been in the classrooms that I’ve been in, but I don’t know that it’s been effectively utilized.” Lori’s moderate acceptance level is reflected in her discussion of her personal technology use, saying “I use it when I have to.” She also expresses some frustration with not “understand[ing] half of what I do on [the computer].”

Lucy. Lucy is a 25-year-old female enrolled in an elementary education program at Ross University. Her personal technology use survey score (8) and her comfort with technology survey score (7) both indicate a moderate to high level of use and comfort. Lucy indicated being comfortable with all listed technologies (reading blogs, writing blogs, eBooks, Facebook, Twitter, other social media platforms, photo sharing sites, video sharing sites, wikis, using the Internet for research, email, and document sharing sites). Lucy also discussed several memories of using technology in her educational experiences. She described having access to the computer lab in elementary school, having access to laptop carts in middle and high school, and using Smart Boards in high school. When asked about her instructional experiences, she mentioned learning how to type and using a “word processor.” When discussing her personal technology use, she

mentioned that being in the workplace has given her a different perspective about her own knowledge, stating “I think I realized how much more I’m able to do than a lot of older people in the workplace.” She continues with “I realized that even though I consider my knowledge pretty basic, I’m proficient, so I can use all of the desktop publishers, word processors, spreadsheets, and I can do very basic coding, so I think my usage is probably above average.”

Michelle. Michelle is a 23-year-old female enrolled in a secondary education program at Harlan University. Both her personal technology use survey score (9) and her comfort with technology survey score (8) indicate a relatively high level of technology use and comfort. Michelle indicated being comfortable using all listed technologies (reading blogs, writing blogs, eBooks, Facebook, Twitter, other social media platforms, photo sharing sites, video sharing sites, wikis, using the Internet for research, email, and document sharing sites). Michelle recalls using technology for presentations in her educational experiences, but she also mentions that she did not experience “a lot of supplemental technology” in her K-12 experiences. When discussing her personal technology use, she said that her technology use revolved around her education and her personal communications. She described using her “laptop for research and homework assignments” and then she describes using “my phone to communicate via email, telephone, Skype, all that good stuff.”

Nina. Nina is a 20-year-old female enrolled in an early childhood education program at Ross University. Her personal technology use survey score (7) and her comfort with technology survey score (6) indicate a moderate level of use and comfort. Nina indicated being comfortable using seven of the listed technologies (reading blogs,

Facebook, Twitter, photo sharing sites, using the Internet for research, email, and document sharing sites). Nina recalls minimal exposure to technology in her K-12 experiences, saying that she was not introduced to Smart Boards until ninth grade, and prior to that, it was only whiteboards or chalkboards. She mentions using math manipulative but never any computerized pieces for instruction. For her personal technology use, Nina described needing to be on the computer for “a minimum of three hours a day because that’s where all of our [school] work is.” She mentions that all of her professors communicate through the online learning management system, Blackboard Learn, and she is on her phone all of the time because she currently lives on campus, which is four hours away from her parents’ home.

Reese. Reese is a 21-year-old female enrolled in an elementary education program at Harlan University. Her personal technology use survey score (10) and her comfort with technology survey score (9) both indicate a high level of technology use and comfort. Reese indicated being comfortable with 11 of the 12 listed technologies (reading blogs, writing blogs, eBooks, Facebook, Twitter, other social media platforms, photo sharing sites, video sharing sites, using the internet for research, email, and document sharing sites). Reese discussed several experiences with technology in her educational experiences. In elementary school, she remembers using something called “Destination Station,” which she described as a giant computer in the front of the class that her teachers used to play songs or display worksheets. She explained that this was different from a Smart Board because “Smart Boards weren’t out yet,” but they were used frequently in her middle school math and science classrooms. She also remembered having use of a laptop cart in middle and high school. Reese described her personal

technology use as “24/7, constantly- unless I’m sleeping.” She also describes herself as being “very comfortable” and “pretty good at technology.”

Sean. Sean is a 31-year-old male enrolled in a secondary education program at Harlan University. Although Sean worked for several years before going back to school, he does not consider himself a career switcher as he “never considered [his] bartending to be a career.” His personal technology use survey score (3) and comfort with technology survey score (4) indicate moderately low level of use and comfort. Sean indicated being comfortable using seven of the listed technologies (reading blogs, Facebook, Twitter, video sharing sites, wikis, using the Internet for research, email, and document sharing sites). Sean recalled only one experience using technology in his education experiences. His experiences included having “one period a week in fifth grade at the Fort Leavenworth campus of a computer class, like learning how to type and stuff.” Sean discussed using technology for both his personal entertainment and educational purposes citing “playing video games, watching movies, [doing] what I need for school, and researching online peer-reviewed articles.”

Data Collection

Data collection began with the initial demographic survey to provide participant background information. Upon choosing to participate, participants completed the online demographic survey by following the link provided to them. The students were given the informed consent as the first page describing the study (see Appendix C). By clicking “I agree,” participants provided their informed consent. Upon clicking their agreement with the informed consent, participants were directed to the demographics section of the survey (see Appendix A). This information was used for both demographic information

on each participant and verifying that the participants fit into the qualifying criteria. If a student answered “No” to one of the questions concerning qualifying criteria, the survey was terminated. A student interested in participating completed the demographic survey and, the student was contacted to set-up an interview once it was completed.

The researcher chose to wait two weeks following the initial invitation to participate to allow potential participants to complete the demographic survey. After that waiting period, each of the twelve participants was contacted via email to identify the most convenient time to conduct a semi-structured interview. A total of twelve students completed the survey and ten participants responded to my requests for an interview. While the remaining two students initially completed the demographic survey, they failed to respond to any emails requesting an interview. Only data from the ten students who participated in both the demographic survey and interviews are included in these findings.

The interviews were conducted via phone or Skype, depending on the agreements between the researcher and the participants in terms of convenience, availability, and appropriateness (Glesne, 2011, p. 113). While telephone interviews are preferred (Glesne, 2011), alternative interview methods, such as Internet-based interviews, do have some benefits (Meho, 2006). An Internet-based interview, such as one conducted via Skype, allows the researcher “an opportunity to not just talk to their respondent but to also see them in real time” (Deakin & Wakefield, 2014, p. 606). Deakin and Wakefield (2014) found that while hosting Internet-based interviews was more convenient for both parties as well as more affordable than face-to-face interviews, they also found that participants were more likely to “drop out of the interview” at the last minute (p. 613).

The researcher used a standardized open-ended interview approach guided by an interview protocol (see Appendix B). This structure allowed for the researcher to use the initial questions included in the interview protocol, but with the semi-structured format, the researcher had the freedom to follow the statements and questions that arose during the interview (Patton, 2002). This is especially important for grounded theory research because a major component of this theory is that the “developing theory is ‘grounded’ in data” (Glesne, 2011, p. 21). Grounded theory uses methods that “take the researchers into and close to the real world so that the results and findings are grounded in the empirical world” (Patton, 2002, p. 125). Since this study is exploring preservice teachers’ perspectives, the best way to obtain insight into their perspective is through open-ended interviews. The interviews utilized an interview protocol that included open-ended questions and allowed for researcher and participant conversation (Patton, 2002). The researcher used structured discovery while conducting these interviews, which Roy, Tubbs, and Burton (2004) defined as “a method in which in-depth interviews and observations focus on specific topics, yet allows enough flexibility to capture unexpected findings and relationships” (p. 170). Using structured discovery allowed the researcher to ensure that the same content was discussed with each participant, while allowing enough flexibility to change confusing wording or probe deeper into a participant’s response.

A digital recorder was used to record each interview. A secondary device, an Apple MacBook Pro, with a locked password, was used as a backup device. All audio recordings were uploaded onto a laptop with a locked password. Once all recordings were successfully uploaded and confirmed, they were deleted from the digital recorder.

Collected data will be saved for three years after the last publication from the research study, at which point it will be deleted.

The interviews were then transcribed for coding. The researcher completed three of the transcriptions, and a hired transcriptionist completed the remaining seven. The outsourced transcriptions were reviewed for accuracy by the researcher, who listened to the recordings while reading the transcriptions. To ensure confidentiality, all participant names, discussed names, school locations, or other identifying factors were assigned pseudonyms during the transcription process. A handwritten identification key linking the pseudonyms to the participant names was stored in a locked cabinet.

Due to the cyclical nature of theoretical sampling in grounded theory, data collection and analysis often occur simultaneously (Glaser & Strauss, 1967). Upon completion of the axial coding process, discussed below, it was determined that additional data were needed to further determine confirming or disconfirming evidence for the emerging theories. Traditionally, theoretical sampling would also continue the interview process with additional participants until no new information is discussed. Unfortunately, within the context of this study this was not possible as the participant pool was limited to the only ten participants who volunteered. In order to complete the study within these restrictions, instead of reaching out to new participants, the researcher returned to the same participants to test the codes and themes found in the data. To collect these data, each participant was contacted and asked to answer brief follow-up questions. Participants were given the choice to conduct another short telephone interview or to complete the questions via email. Of the ten participants, six (60%)

responded with follow-up responses via email. Four of the ten (40%) participants did not respond to the request for an additional interview.

Data Analysis

The researcher used a Straussian grounded theory approach that closely ties theoretical sampling techniques to the coding process (Grbich, 2012). The coding process used a three-phase approach: open coding, axial coding, and selective coding. Open coding is the initial approach that allows for the researcher to identify emerging themes and engage in constant comparison to collapse the themes into categories (Draucker, Martsof, Ross, & Rusk, 2007). Using the constant comparative method (Glaser & Strauss, 1967) allowed for frequent analysis of the accuracy of the initial codes and allowed for adjustment as necessary. Glaser and Strauss (1967) define the constant comparative method as a method that is “concerned with generating and plausibly suggesting many categories, properties, and hypotheses about general problems” (p. 105). Glaser and Strauss (1967) asserted that while using the constant comparative method during analysis, each coding incident must be constantly compared to all other previous incidents both within the same category and across all other data. The initial coding process was done with a research partner under the direction of the dissertation committee chair. The researcher began with an initial open coding session of one interview, which was followed by a discussion of results. Throughout this open coding session and discussion, the researcher continued to adjust and add to the codes so that they were representative of the data. For example, some initial themes became clear within perceptions; for example, the ideas that using technology improves student engagement, makes life easier, and promotes higher levels of thinking were discussed.

During this process, the researcher created code note memos (Strauss & Corbin, 1998) to capture analytic thinking, as well as to facilitate any further exploration of possible emerging themes and ideas (Maxwell, 2013). Strauss and Corbin (1998) define code notes as “memos containing the actual products of the three types of coding: open, axial, and selective” (p. 217). One purpose of using memos is to work through code definitions in the analysis process. For example, my coding memos collected my initial thoughts regarding emerging codes and theories. These coding memos became a written example of the researcher’s thought process and were used to collect ideas. By defining codes, the researcher attempted to avoid drifting from the original meaning of the code (Gibbs, 2007). Memos also helped to keep the research grounded while facilitating maintained awareness of the data throughout the analysis process. Memo writing began with the initial open coding and continued throughout the research process (Strauss & Corbin, 1998).

Upon completion of this initial coding process, the researcher revisited the data to conduct axial coding. Strauss and Corbin (1998) define axial coding as “the process of relating categories to their subcategories” (p. 123). Using this process allowed for the careful examination of emerging categories and continued adjustment of codes and definitions throughout the process. For example, at this point, it became clear that there were distinct categories and subcategories. The categories that emerged included benefits of technology, drawbacks of technology, barriers, and supports needed. After coding three separate interviews, inter-rater reliability was calculated. Each round of analysis for each of the three interviews was at or above 80% (83%, 90%, and 80%). Because of the

relatively high IRR, it was determined that the researcher would complete the remaining coding herself.

The last step of the theoretical coding process is to employ selective coding. Draucker, Martsolf, Ross, and Rusk (2007) define selective coding as the “examination of the data for the purpose of unearthing the core category” (p. 1138). Using selective coding intends to verify the theory and further develop any emerging findings. For example, at this point, it became clear that there were three distinct categories related to perceptions of using technology: positive perceptions, negative effect, and neutral effect. Positive perceptions of using technology had 12 distinct subcategories, negative effect had 8 distinct subcategories, and neutral effect had 4 distinct subcategories.

Throughout the data analysis process, the researcher aimed to use theoretical sampling to develop theory (see Figure 3.2). As the figure shows, the process of using theoretical sampling is cyclical. As data is collected, the analysis and coding process is being conducted. Constant comparative analysis is used throughout the coding process. Glaser and Strauss (1967) describe the constant comparative analysis as an explicit procedure that combines explicit coding procedures with a style of theory development. They also describe the purpose of the constant comparative method as “joint coding and analysis to generate theory more systematically by using explicit coding and analytic procedures” (p. 102). Each phase of coding cycles back to a process of theoretical sampling. Strauss and Corbin (1998) define theoretical sampling as “the process of data collection for generating theory whereby the analyst jointly collects, codes, and analyzes his data and decides what data to collect next and where to find them, in order to develop

his theory as it emerges” (p. 45). This cycle of collection and analysis occurs until no new theories emerge.

The purpose of using theoretical sampling throughout the data analysis process is to test emergent theory and expose all themes. Theoretical sampling occurs “when the analyst jointly collects, codes and analyzes the data and decides what data to collect next and where to find them” in order to explore the emerging theory (p. 36). This process occurs cyclically until theoretical saturation occurs. Strauss and Corbin (1998) define theoretical saturation as “the point in category development at which no new properties, dimensions, or relationships emerge during the analysis” (p. 143). With this process, the resulting theory is then considered “conceptually dense and grounded in the data” (Schwandt, 2001, p. 111). In this study, data was collected and analyzed. Throughout this process, as themes emerged, the data collection process and the data analysis process were emended to reflect the new ideas. For example, as the analysis began to show strong themes, the forthcoming interviews were conducted to further explore those potential themes. Upon completion of theoretical saturation from the existing data, the data were then categorized and discussed to facilitate formation of a substantive theory.

Data Credibility

While qualitative research has been widely criticized for being “unsystematic” or simply “exploratory” (Glaser & Strauss, 1967, p. 223), several steps were taken during this study to improve upon the credibility and trustworthiness of the data. Lincoln and Guba (1986) suggest “credibility as an analog to internal validity” (p. 76). Also, Lincoln and Guba define trustworthiness as a combination of the following criteria: internal validity (credibility), external validity (transferability), reliability (dependability), and

objectivity (confirmability). The researcher used a Reflexivity Memo, member checking, reflexive journaling, and code note memos as methods to enhance the credibility and trustworthiness of my research.

The researcher, a constructivist, attempted to remove herself from the research as much as possible. By reflecting within a Reflexivity Memo at the beginning of this study the researcher was able to expose, clarify, and explore possible biases held from past experiences as a literacy instructor and as a personal technology user (Maxwell, 2013). See Appendix A for the Researcher Identity Memo. If, as Maxwell (2013) states, the researcher is the “instrument” of the research (p. 45), it is acknowledged that the researcher may have a “powerful and inescapable influence” on the research (p. 125). Given this consideration, the researcher focused on preventing past experiences from influencing the study’s conclusions (Glesne, 2011).

Another step taken to improve the credibility and trustworthiness of this research was to use member checking of the interviews with the participants. Member checks were executed by providing participants with typed transcriptions of their respective interviews to verify that the accuracy of their comments (Maxwell, 2013). Nine participants verified the accuracy of their interview transcription. One interview was not verified. Aaron asked not to be recorded, so the researcher took notes during the interview. Upon completion of the interview, he was sent a copy of the notes so he could verify their accuracy, but he never responded.

During the data collection process, the researcher also used theoretical memos throughout to surface and collect reflective thoughts. Grbich (2012) defines theoretical memos as “a descriptive record of ideas, insights, hypothesis development and testing”

(p. 77). Using theoretical memos is important for data credibility because it allows the researcher to expose any potential biases developed during the interview process. In order to maintain credibility, a researcher must be aware of his or her impact on the research and expose and collect reflections during the process. Using theoretical memos also created a running record of the research methods and procedures used. This process allowed me to expose and record my reflective thoughts during the research process.

Lastly, during the analysis phase of this study, the researcher continued writing code note memos detailing the category development process and the coding to capture analytic thinking as well as to facilitate further exploration of possible emerging themes and ideas (Maxwell, 2013; Strauss & Corbin, 1998). Strauss and Corbin define code notes as “memos containing the actual products of the three types of coding: open, axial and selective” (p. 217). One aspect of using these memos is to work through code definitions in the analysis process. By maintain code note memos, the researcher did not only keep a running record of the evolution of the codes, but also used the process as a brainstorming springboard to work through the codes and explore larger themes within each. Code note memos are also closely related to constant comparative analysis because it forces constant be reevaluation of the analysis procedure and changing thoughts, ideas and theories as they evolve (Maxwell, 2013). Using code note memos also ensured that my categories were fairly representing the data as the data was raised to a conceptual level.

Summary

In summary, this qualitative study used a constructivist approach to conduct a grounded theory study. Participants were selected via convenience sampling and

interviewed using a semi-structured interview protocol. Throughout the participant selection, data collection and data analysis constant comparative analysis and theoretical sampling was used to help achieve theoretical saturation. Data analysis was done with a Straussian grounded theory coding process. Open, axial and selective coding was used to work through the codes to identify themes and emerging theories. As a result of these research methods, several themes and emerging theories emerged, which will be presented in Chapter four

Chapter Four

With technologies rapidly revolving, education is seeing the impact in all areas. One of the newest areas is the connection between the new literacies and digital technologies and how it plays into our education system. The education community is struggling to stay current with instruction, and the research community is finding it challenging to generate new knowledge when the nature of literacy changes faster than can be articulated and developed (Leu et al., 2013). Research is being done exploring practicing teachers' perceptions and use of technology (Coiro & Dobler, 2007; Katić, 2008; Wolsey & Grisham, 2007), but there are only few studies exploring preservice teachers' perceptions (Al-Hazza & Lucking, 2012; Burnett, 2011; Chen, 2010; Sang, et al., 2010) and only two specifically discussed technology in literacy instruction (Al-Hazza & Lucking, 2012; Kist & Pytash, 2015). It is important to explore the perceptions of preservice teachers, as they are the next generation of teachers. Many of these aspiring teachers may have grown up surrounded by technology, but they likely did not receive instruction with it as P-12 students. Therefore, the purpose of this study was to explore preservice teachers' perceptions of digital technologies in literacy instruction.

Participant Demographics

In order to obtain the initial perceptions of beginning education students, it was imperative to include only students in the first semester of their respective programs.

Four universities were contacted, and a total of 90 students were invited to participate in this study. Ten students from two universities replied and were invited to participate.

Overall Group Description

Each of the participants was in the first semester of a licensure program at one of two universities. Table 2 represents the data for the overall group demographics. The participants were split evenly (50%) across the two participating universities, Harlan University and Ross University. Overall, six (60%) of the participants were enrolled in a secondary education program, three (30%) of the participants were enrolled in an elementary education program, and one (10%) participant was enrolled in an early childhood program. Ages ranged from 19 to 42, with the mean age being 25.2 years old. When asked to rate their personal technology use on a scale in which 0 is no technology use and 10 is a frequent user, the self-reported scores ranged from 3 to 10 ($M = 7.67$, $SD = 2.12$). When asked to rate their comfort with technology with 0 being not comfortable at all and 10 being completely comfortable, the scores ranged from 4 to 10 ($M = 7.22$, $SD = 1.99$).

The second part of the demographic survey asked the participants to choose the applications they were “comfortable using.” One participant, Aaron, did not complete the survey, and he did not respond to a follow-up request for the information, so these percentages are calculated out of nine ($n = 9$) participants. There were four applications, reading blogs, Facebook, using the Internet for research, and email, which 100% ($n = 9$) of the participants indicated they were comfortable using. Eight-nine percent ($n = 8$) indicated that they were comfortable using document sharing sites. There were three applications, e-books, photo-sharing sites, and video sharing sites, that 78% ($n = 7$) of the

participants indicated comfort using. Sixty-seven percent ($n = 6$) indicated they were comfortable writing blogs. Lastly, 44% ($n = 4$) of participants indicated that they were comfortable using wikis and social media platforms other than Twitter or Facebook.

Table 2

Demographic Data

Basic Demographic Information					Participants Indicated which of these applications they are "comfortable using".											
University	Age	Degree/Licensure	Personal Tech Use	Comfort with tech	Reading Blogs	Writing Blogs	e-books	Facebook	Twitter	Other Social Media	Photo sharing sites	Video sharing Sites	Wikis	Using the internet for	Email	Document Sharing
Aaron	Ross	20	6-12													
Doug	Harlan	28	6-12	8	9	X	X	X	X	X	X	X	X	X	X	X
Gabby	Ross	19	PK-6	10	7	X	.	X	X	.	.	X	.	X	X	X
Jill	Harlan	42	6-12	7	10	X	X	X	X	.	.	X	.	X	X	X
Lori	Ross	24	6-12	7	5	X	X	X	X	.	.	X	.	X	X	X
Lucy	Harlan	25	PK-6	8	7	X	X	X	X	X	X	X	X	X	X	X
Michelle	Harlan	23	6-12	9	8	X	X	X	X	X	X	X	X	X	X	X
Nina	Ross	20	B-6	7	6	X	.	.	X	X	.	.	.	X	X	X
Reese	Harlan	21	PK-6	10	9	X	X	X	X	X	X	X	.	X	X	X
Sean	Harlan	31	6-12	3	4	X	.	.	X	.	.	X	X	X	X	.
						100%	67%	78%	100%	78%	44%	78%	44%	100%	100%	89%

Code Definitions

Throughout the analysis of this research, several common codes were worked into a code book. The emergent codes were defined and explained until they were representative of the data. The purpose of writing out the explanation of each code will help to keep you away from the "definitional drift" (Glesne, 2011, p. 197) which can

occur as the material coded earlier ends up having a slightly different meaning than the material that is coded later in the coding process.

Positive Perceptions of Technology

As displayed in Table 3, the codes for the participants' positive perceptions of digital technologies are as follows:

Accessing Information- Technology allows for information to be easily accessible.

Assistive Technology- Technology is used to specifically assist students with special needs.

Collaboration- Technology allows for students to purposefully work together on a task.

Communication- Technology is used to promote communication between teachers, parents, students, community members and/or coworkers.

Community- Technology allows for students to interact and connect to one another and/or creates a sense of classroom community.

Embracing Change- Technology is changing our society, and our schools should be embracing that change by incorporating technology.

Improves Learning- Using technology along with instruction helps improve the students' learning.

Innovation- Technology allows for new practices, ideas and/or theories to be incorporated into instruction.

Convenience- Technology is used to help make everyday tasks easier and/or quicker.

Instructional Practices- Technology is used in teaching strategies (i.e.: differentiation, guided reading, etc.).

Real Life Application- Using technology in school will help bridge the gap between real life application and what is done in schools.

Engaging Students- Technology allows for instructional practices that encourage students to willingly engage and invest in their learning process.

Table 3

Positive Perception Codes Frequency Count

	Access Information	Instructional Practices	Engaging Students	Communication	Community	Real Life Application	Embrace Change	Improves Learning	Innovation	Convenience	Assistive Technology	Collaboration
# of Participants	7	6	6	6	5	5	4	4	4	4	4	2
Frequency Total	21	17	17	11	12	6	17	17	16	14	9	3
Percentage for Positive Perceptions	13%	11%	11%	7%	7%	4%	11%	11%	10%	9%	5%	2%
Percentage for total data	7%	6%	6%	4%	4%	2%	6%	6%	6%	5%	3%	1%

Negative or Neutral Perceptions

As displayed in Table 4, the codes for the participants’ negative or neutral perceptions of digital technologies are as follows:

Distraction- Using technology in a classroom can cause students to lose focus and interfere with classroom activities.

Human Element- Using technology removes the social connection between the teacher and students and/or the connection between students themselves. This includes sentiments such as: the computer is replacing the teacher, or the students are buried in their screens not speaking to one another.

Ineffective Implementation- Teachers are either not using technology properly or they are not using it effectively.

Internet Safety- Not being able to control or monitor the information or media their students may encounter.

Negative Effect on Learning- Participant believes that technology is hurting a students' ability to learn. This term also includes references to an overreliance on technology that will limit or hurt students or promote laziness in learning.

Prefers Print Based Texts- Teachers indicate a preference to print-based text instead of computer-based text.

Takes Away from Content- Instead of being focused on the curriculum being taught, the technology puts the lesson's focus is on tool/game/app.

Technology Unnecessary- Teachers indicate that technology is not needed for their classrooms.

Time Waste- Including technology in literacy instruction can take up too much time with either instructional preparation or class time.

Table 4

Negative Perception Codes Frequency Count

	Negative Effect on Learning	Internet Safety	Distraction	Human Element	Ineffective Implementation	Takes Away from Content	Unnecessary Teacher	Prefers Print based Text	Time Waste
# of Participants	7	4	4	3	3	2	2	2	1
Frequency Total	17	6	6	8	6	4	4	3	2
Percentage for Negative Perceptions	30%	20%	20%	14%	20%	7%	7%	5%	4%
Percentage for total data	6%	2%	2%	3%	2%	1%	1%	1%	<1%

Barriers

As displayed in Table 5, the codes for the participants' perceptions of potential barriers of digital technologies are as follows:

Access-There is limited access to working technology either in school or at home (also includes budget or money issues that would prevent access).

Attitudes- Anyone (students, teachers, parents, and/or administration) with a negative outlook towards technology will be a barrier limiting implementation.

Classroom Management- Technology inclusion is a barrier because its use can lead to avoidable classroom management challenges.

Extra Burden- Including technology into instruction forces teachers to use extra time and energy to learn the technologies and/or create safe and appropriate activities for students.

Lacking Knowledge- Teachers' lack of knowledge of technology's affordances, either a particular technology tool, or knowing how to use a tool, is a barrier to technology inclusion.

School Policy- Policies limiting the use of and/or access to different technologies in schools may prevent the inclusion of different technologies or applications (i.e.: a no cell phone policy would limit using cell phones for instructional purposes).

Table 5

Perceptions of Future Barrier Codes Frequency Count

	Access	Lacking Knowledge	Classroom Management	Attitudes	Extra Burden	School Policy
# of Participants	8	7	5	3	3	1
Frequency Total	14	8	5	6	4	1
Percentage for Future Barrier Perceptions	37%	21%	13%	16%	11%	3%

Supports Needed

As displayed in Table 6, the codes for the participants' perceptions of supports needed of digital technologies are as follows:

Community Support- Having a supportive community to back their decisions (i.e.: school community, home community, etc.)

Access- Participant expresses a need for technology to be accessible and/or reliable both in the classroom and in the community (i.e.: community hot spots, library access, etc.).

IT Help- Participant expresses interest in needing an IT help person to support technology inclusion due to tech issues.

Knowledge- Participant expresses interest in needing knowledge of the technology available and how to use it to support technology inclusion.

Professional Development- Participant expresses a specific need for professional development opportunities to gain technological and/or pedagogical knowledge to support technology inclusion.

Safety Supports- Participant expresses an interest in having the ability to block sites and/or monitor students' activity online to maintain online safety.

Table 6

Perceptions of Future Supports Needed Codes

	Need for Ongoing Teacher Development	Community Support	IT Help	Safety Supports	Access
# of Participants	7	3	3	2	1
Frequency Total	16	5	4	4	1
Percentage for Future Supports Needed	53%	18%	15%	12%	12%

Research Question 1

The first research question asked: What are entering preservice teachers' perceptions of the role of technology in literacy instruction? The analysis of RQ 1 has been divided into the coding subcategories and ordered by the percentage of participants who discussed these codes. Figure 3 displays how the total percentages of positive perceptions data compares to the total percentages of negative or neutral perceptions data.

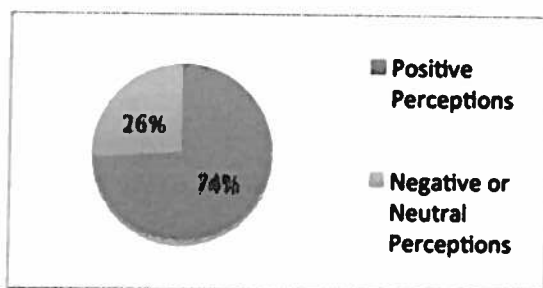


Figure 3: Total Percentages for Perception Data

Positive Themes

Overall, there were 3 different themes that related to the participants' positive perceptions of technology use in literacy instruction. There were 216 total coded passages for perceptions, including both positive and negative perceptions, with positive perceptions representing ($n = 160$) 74% of the total (see Figure 3). See Table 7 for the layout of the themes within positive perceptions. The themes in order of frequency are: (a) using digital technologies to provide quality instruction, (b) recognition that the future

includes adapting to innovation and change, and (c) using digital technologies to connect within a digital world.

Table 7

Positive Perception Themes

	Using Digital Technologies to Provide Quality Instruction	Recognition That the Future Includes Adapting to Innovation and Change	Using Digital Technologies to Connect Within a Digital World
# of Participants	10	7	8
Frequency Total	95	39	26
Percentage for Positive Perceptions	59%	24%	16%
Percentage for total data	33%	14%	9%

Using digital technologies to provide quality instruction. The participants within this study frequently discussed that using digital technologies can help to provide quality instruction. In fact every participant (100%) discussed this theme at least once. This theme was cited a total of 95 times across all of the data, representing 59% of the perceptions data and representing 33% of the total data, making this theme the most frequently cited theme by far. There were six codes used within this theme, namely (a)

accessing information, (b) instructional practices, (c) engaging students, (d) improves learning, (e) makes life easier, and (f) assistive technology.

Accessing information. Seven (70%) of the participants indicated that the code, *accessing information* was a benefit of using technology in literacy instruction in 21 coded sections. Many of these seven participants discussed the power of technology to provide access to any information at any moment whether it is in the classroom, the nation, or the world.

For example, Jill stated “access to a digital library of books...[gives] them access to the whole world and that’s what technology can do for you.” Lori also mentioned, “it gives us the opportunity to access more material than we’ve ever had access to.” Aaron discussed using “the internet for research,” and Michelle stated that “there’s a greater amount of resources available to those that are teaching literacy and helping with expanding their literacy.” Doug said, “There’s so much information that you can try to know now that...in the past you have never bothered to look up.” Doug also added that not only was more information available, but it could be accessed almost instantly: “they could just quickly Google it, or if they wanted to know something more about the author...or basically anything, you can look it up in a moment.” Lastly, Sean stated that students simply have access to so much more information: “you don’t have the same things as before, you have access to so many more books and so many different levels.”

Several participants also mentioned being able to support learning outside of school with technological access. For example, Gabby stated, “You can teach yourself through the Internet, you can look stuff up, it helps the students when they’re not at school and they don’t have a teacher right with them.” Lori mentioned having access to

more information to assist with her teaching and planning, when she stated, “you know if there’s a fantastic math professor on the West Coast, I now have access to his lectures...whereas I never would have known about what he’s doing before.” She also said, “things like YouTube and social media give you the chance to see what these other teachers are doing to incorporate a lot of things.”

Some participants also took a more global approach in accessing information. For example, Lori stated, “we can find out what people are doing across the world, it’s not just states or even across the country, it’s across the world.” Sean raised this: “You’re not just restricted to the point of view of your teacher and your textbook. You can explore every avenue and every point of view without wasting a whole bunch of time.” Being the most frequently coded section, it is clear that the majority of participants perceive a benefit of technology as allowing increased access to information.

Instructional practices. Six (60%) of the participants also discussed using technology to promote best practices in the classroom; 17 coded passages were identified. Within this theme, all six (60%) participants mentioned using some form of technology to promote a facet of differentiation. For example, Gabby stated, “everyone learns differently, and I would want to make sure that everyone learns as much as they can the best way that they can.” Michelle stated, “any time that we are presenting information on using different technologies and allowing the kids to take to it in a different way, then maybe we’re increasing the likelihood that the information will stick with them.” Doug also discussed, “some students learn particularly well in different types, you know, modes of learning, I think that technology again makes that a lot easier.” Lucy also felt that “part of a teacher’s job is to differentiate for different students.” Jill said, “There’s all

kinds of different learners... that need to see and hear it...and I think technology... includes more styles of learning.” Reese also had several ideas about using technology to differentiate her classroom. For example, she discussed giving “them the choice to write out something physically or give them options.” Reese also made a direct connection to her future literacy instruction: “I like the way that literacy is taught now, like with different types of reading like group reading and independent, so I would have a bunch of those offsets...I would pull group reading and have kids write stories and responding to those. I don’t think I would use it the whole time, but it would be part of my lesson definitely.”

Other ideas discussed include several other positive instructional practices. Doug discussed using technology to “make learning more interactive.” Michelle included “exposing students to a wider variety of tools in their toolkit.” Lastly, Jill made several statements discussing different instructional strategies that she intends to use in her future literacy instruction. She intends to use technology to stay fresh in her instruction: “Once you think you know everything, you’re going to become stagnant and less effective and out of touch, meaning you’ve got to be dynamic.” She also mentioned using technology to help model the writing process: “If they’re doing a [writing] assignment, I’m going to participant and do it and I want to show them how I’m doing” by “using a smartboard to model.” With six (60%) of the participants making statements connected to learning strategies, it is clear that the majority of the participants agreed that technology could reinforce their literacy instruction.

Engaging students. Six (60%) of the participants also discussed using technology to encourage student engagement, resulting in 17 coded sections. The participants

discussed using technology to grab their future students' attention, to keep them interested, and to present materials in a new and engaging format.

For example, Nina stated, "It [technology] gets students' attentions." Reese had a similar thought: "it [technology] is something that the kids are interested in." Jill stated, "I think it improves, it encourages" and "Just being able to hand it [technological device] to the student encourages them." Michelle looks forward to using technology in her future literacy instruction: "I would love to present information in such an engaging way [using technology]." While Sean may not be completely comfortable with technology inclusion, he points out, "It has to be worked into the coursework and the frame of instruction because you've got to meet the kids where they are comfortable."

Lucy sums up her thoughts with this quote:

I think that one of the most important things for teaching kids to read is interest, so you know struggling readers, if you want to make sure that they're interested in what they're reading and you want to make sure that they feel that there's purpose to what they're doing and that it's relevant to them. So I think in that way, it could be really useful if they prefer reading an e-book I don't know why that should be a problem over a paperback. If they're just interesting in reading, to me that's one of the most important things.

While not all participants were comfortable with using technology for student engagement, all six (60%) saw it as a necessary and/or powerful way to teach literacy.

Improves learning. Similar to Embracing Change, while only four (40%) of the participants stated that using technology improves learning, it was mentioned 17 times by those four participants. Jill stated that, "technology as used in conjunction with

instruction actually improves kids' achievement test scores." She also offered that "it [technology] improves and encourages, it improves literacy (*sic*)." Lori stated that technology has "made us better readers, and it helped them [students] and inspired them to be better." Thinking towards her future literacy instruction Lucy stated, "I would try to incorporate technology in a way that adds to the lecture and teaches the students a skill on the computer that they haven't had before." Reese also saw the benefit of incorporating technology into literacy instruction by using technology to "reinforce what they've learned..." Many of these 17 references to improving learning were very general statements, such as Jill's simple statement: "it improves learning." None of the participants presented reasoning as to why it improves student learning; they were simply expressing their initial perceptions that technology can help improve literacy learning.

Makes life easier. Four (40%) participants referenced using technology to make their lives easier. This theme also had several references across the four participants for a total of 14 mentions. Aaron mentioned using technology to ease the writing process: "it shows them an easier way for something that might have been hard before." He continues with this example: "if a student has to write a paper in English class but they don't know what the margins are or how to format it, Word has the options to help out with it." Doug noted, "Now it's really easy to find out whatever you want to know." Gabby stated, "With computers everything is being shortening, like if I'm messaging someone, I won't use full words or anything. There's spell check and everything, so I don't have to think about it." Gabby also added that with "grammar and spelling...you can integrate the computer which makes it a lot easier, and you can do it a lot quicker" and "the e-book... is more convenient for the kids." Lastly, Jill stated, "I am always so amazed at what I can

find on a computer to make my job easier.” These participants all discussed simple ways that they would use technology to alleviate the normal workload and allow technology to work for them.

Assistive technology. Four (40%) participants mentioned using technology to assist students with disabilities. This theme was cited nine times across the four participants. All four participants made references to being able to have text read to students to help assist them with their literacy instruction. For example, Jill recalled her son’s experience with assistive technology, stating that having the ability “to have someone read it to him” made all of the difference. She also discussed technology “that would help him type it up and things like that so that has changed literacy” for him. Lori also cited audio versions of e-books and “voice to text” functions when she stated, “it’s great because for those students who can’t read or can’t write yet, it can read it to you.” Lucy stated, “In special education, that’s another area where I think technology is crucial.” Reese summed it up thus: “I think technology offers a lot of ways for kids who maybe can’t sit down and read a book very well to develop some sort of literacy like audio books... it’s definitely good to have.” With assistive technology being an entire other genre, especially in special education, it is helpful to see that these preservice teachers see the benefit of using these technologies to assist their daily literacy instruction.

Recognition that the future includes adapting to innovation and change.

Another frequently cited theme discusses the idea that some participants were able to recognize the change happening within our society and realizing that changes will need to occur within the classroom to mirror the changes happening within today’s society.

Seventy percent (70%) cited this theme with a total of 39 references across data representing 24% of the perceptions data and 14% of the total data. There were 3 codes used within this theme, namely (a) real life application, (b) embracing change, and (c) innovation.

Real life applications. Five (50%) of the participants saw using technology as a way to encourage real life application of technologies or techniques in their (eventual) classroom. Most stated that their students would be using different forms of technology outside of school, and that they would need to know how to apply it to school learning. For example, Michelle said, “I feel like those different modes of technology are what the kids are exposed to out of school, so why shouldn’t I use them in school to perhaps make the material more relatable?” Lucy stated, “kids need ‘real world application skills’ and what we’re lacking in most situations is real technological training that can make people workplace ready.” Reese stated that using technology is “a good thing because it’s more proficient (*sic*) and more practical because kids are gonna be using this stuff for the rest of their lives, so it’s good that we’re teaching them how to.” Reese also mentions “getting them familiar with it [technology] for their future lives because they’re going to be using technology a lot.” Sean noted, “I’m pretty sure it’s increasing in unbelievably rapid degree, it kind of has to be, with how people are living their lives now. I think it has to be integrated.” Jill sees incorporating technology into her literacy instruction as imperative for her students’ futures: “I will definitely use multiple technological platforms so when they go out into jobs, they’re going to probably use technology in some way.” Each of the participants who discussed these ideas all felt that it was imperative that we prepare our students by giving them the skills necessary for success in their future.

Embracing change. Appropriately following the previous section, four (40%) of the participants discussed using technology to embrace the change that is occurring in our society. Even though only four (40%) of the participants discussed this topic, those who did referenced it 17 times throughout their interviews. The overall sentiment these participants conveyed was that society is changing, and schools should be changing with it. For example, Aaron stated, “technology is evolving and schools are evolving, so they should be evolving together.” Many statements made were positive about the imminent change. For example, Doug made several references to the need to embrace the change by using phrases such as “not having technology would be unnatural,” and “it’s a different type of world that doesn’t exist anymore,” and “to just ignore it would deny the reality of how everything is now.” Jill echoed his sentiment, stating, “technology has changed education and you either get on board or you’re left behind,” and “the generation that is growing up is going to do profound things and we have to be willing to be the kind of teachers that allow it happen.” Interestingly, Sean had a different outlook on embracing this change:

I’m pretty sure it’s [technology] increasing in unbelievably rapid degree. It kind of has to be with how people are living their lives now. I think it has to be integrated as a part, which actually kind of scares me a bit [but]... I’m going to have to be able to go into a situation where I’m going to learn from them.

Not all of the participants who discussed this topic were comfortable with the changes occurring, but they were willing to accept them. This topic was discussed by a minority (40%) of the participants and those who did discuss it felt very strong that this change needed to be replicated in all areas of our teaching.

Innovation. Four (40%) of participants discussed using technology in innovative ways for their literacy instruction. Again, while only four (40%) participants cited Innovation, there were 16 references in total. Doug suggested “some people use smart phones as clickers for class.” Lori mentioned pulling in computer games that may incorporate students’ interest and help them make connections to the curriculum: “Let’s incorporate what you’re doing, you know if you go home and play bubble bash... okay let’s use that... you know make your sixth graders shoot math problems out of something... it comes down to the teacher’s creativity.” Michelle offered that she thinks it is “so fantastic when teachers really capture novel ways of presenting information” and that she would “really love anything that [she] could do to just get the information that would make it more appealing.” Jill offered several examples of innovation, including using blogging for writing assignments, using Twitter to “say something profound in a hundred and forty characters,” using computer games and simulations for learning experiences, and using technology to create “multi-genre projects.” Lastly, Jill suggested that instead of having her students put their cellphones away, she intends to use them as interactive resources:

I’m not gonna have my kids put their phones in their pocket, because yeah you’re gonna run into the ones that are texting when they’re not supposed to be, but the fact of the matter is it’s a tool. Let’s use it. There are all of these free online apps, dictions apps that I really want them to [use]. I really want them to feel like, [if you] don’t know what that word means, okay well, the first person to tell me what it means gets a thumbs up. So let’s use it to look it up because I know they’re not going to go pick up an actual physical dictionary.

Being beginning education students, they may not know exactly how they will incorporate these innovative practices, but their initial perceptions show that they are beginning their programs with many great ideas and preconceptions to start.

Using digital technologies to connect within a digital world. Lastly the third theme discussed within positive connection is the idea that using digital technologies within a classroom can help connect the teacher and/or students with the digital world. This theme was discussed by eight (80%) of the participants with a total of 26 references. This theme represents 16% of the perceptions data and 9% of the total data. Within this theme, three codes were used, namely, (a) communication, (b) community, and (c) collaboration.

Communication. Five (50%) of the participants discussed using technology to promote communication with parents, students, coworkers, or the outside world. Two participants mentioned using technology to communicate class updates with parents. For example, Doug stated that “using a website to post anything that we’re doing” would be an effective method of conveying student progress. Jill stated, “I think it’s going to be cool like having a blog that’s posted that the parents can access or a discussion board that the parents could access and see what your kid is doing and you know, read what they’re saying.”

Other participants discussed using technology to communicate within class. For example, Aaron discussed “sending email to my students during class so they have their next task.” Sean foresaw himself “creating a class discussion online.” Jill discussed “giving teenagers, especially, a voice, a safe voice, you know with blogs or discussion

boards.” She also explained, “I think we have to use those things, like blogs, wikis or a class Facebook page or a class Twitter account to communicate.”

Another idea discussed by three different participants was using technology to communicate with outside resources. Jill mentioned Skyping writers into her class so the students can interview them and “talk to actual people who use writing” in their daily lives. Lori would use technology “to talk to instructors or other clinicians.” Michelle stated, “I can communicate with the entire world basically through email and calls and everything so that obviously improved the method of communication.” Using technology to communicate is a rather common daily activity for most people, but these participants also saw the power of using technology to communicate outside of their classrooms as well. While some of the participants indicated using simple forms of communication, such as informing parents, a few participants did see that using technology could be a new way to allow their students to communicate with the broader world of literacy.

Community. Five (50%) of the participants cited using technology to promote or encourage a sense of community through technology. Jill mentioned fostering a “global community that is really the future” and in discussing online courses and virtual learning communities “feeling like a part of a community even though I’m never gonna see these people.” Jill also stated that she would use technology to “foster community.” Doug also stated that technology creates “kind of a community as well.” Lori recalled an experience partnering with a younger student to work on a computer project, saying, “it really did foster those positive relationships.”

Three participants discussed different ways they can foresee themselves using technology in their future literacy instruction. Reese suggested that she would “create

some sort of community, like if the whole class had a blog and everyone commented on others' posts and stuff like that." Doug imagined creating a class blog where "everyone in the class can read it or responded (sic)" and it would "give a connection to each other." Sean also discussed using Facebook to create a class page that would allow for interaction between himself and his students: "I've thought about trying to set up class discussion boards, like going through Blackboard and have those constantly interactive between the students and myself in addition to what we do in class. And maybe having something... like a class Facebook page." All five participants discussed using technology to create a community within their classroom, whether it was inclusive of themselves, their immediate community (i.e.: parents, school), or the global community as a whole.

Collaboration. Lastly, two (20%) of the participants mentioned using technology to encourage collaboration with their students. This theme was referenced three times across two interviews. Doug mentioned, "there's a huge potential for collaboration over the internet." Jill stated, "we can use technology to get information to one another, to compare notes and to give feedback." While this is a brief theme, it is important to note, because both of these ideas reference allowing students to make connections with one another using a different medium than students have in the past, which two preservice teachers have noted as a potential for their future literacy instruction.

Overall, the participants had many positive perceptions of what using technology can do to positively impact their future instruction. See Table 8 for the complete layout of the positive perception themes across all of the participants. With the theme, Using Digital Technologies to Provide Quality Instruction being the most frequently cited

theme across all of the data, it is clear that these preservice teachers are imagining ways to include technology in their future literacy instruction. With positive perceptions representing 74% of all of the perception data (see Figure 3), the findings suggest that the participants are open-minded to including digital technologies within their future literacy instruction. While their statements are largely supportive of technology, they do have some very valid concerns regarding technology use in their future instruction.

Table 8

Positive Perception Themes across Participants

	# of Participants	Frequency Total	Aaron	Doug	Gabby	Jill	Lori	Lucy	Michelle	Nina	Reese	Sean
Quality Instruction	10	95	3	10	8	26	16	6	7	2	8	9
Adapting to Innovation and Change	8	39	1	5	0	20	3	1	3	0	3	4
Connect Within a Digital World	7	26	1	4	0	13	3	0	1	0	1	3
Totals			5	19	8	59	22	7	11	2	12	16

Negative or Neutral Themes

There are 216 total coded passages for Perceptions, with negative or neutral themes representing ($n = 56$) 26% of that total (see Figure 3). See Table 9 for the layout of themes across the negative perceptions data. Overall, there are three themes discussed related to negative or neutral perceptions. They are: (a) negative effect on learning, (b) complicate a teacher's job, and (c) outside of their comfort zones.

Table 9

Negative or Neutral Perception Themes

	Negative Effect on Learning	Complicate a Teacher's Job	Outside of Their Comfort Zones
# of Participants	7	8	4
Frequency Total	21	20	15
Percentage for Positive Perceptions	38%	36%	27%
Percentage for Total Data	7%	7%	5%

Negative effect on learning. By far, the most frequently stated theme in this category was that technology may have a negative effect on students' learning. In fact, seven (70%) of the participants mentioned this concern 21 times in total across their interviews. This theme represents 38% of the perceptions data and 7% of the overall data.

Within this overall theme, three codes were used, namely, (a) overreliance, (b) loss of motivation, and (c) students losing the ability to recall.

Overreliance. Four (40%) of the participants indicated that technology would cause students to over-rely on the technology and not learn the taught skills. For example, Lori mentioned that using spell or grammar check will keep students from learning those skills, when she said, “the other hindrance is autocorrect” and that students “don’t learn how to go back and look and correct it.” Lori further explained her point, saying, “I think it’s just putting us in this position where we’re more reliant on the technology to do the job for us. Sean also stated that technology “can be detrimental” because of the students’ overreliance on it: “...if you use the calculator too much then you won’t know how to do the calculations.” Doug felt that using technology “makes it harder to remember... when you have the crutch of always being able to look up anything. Why should you memorize anything?” Gabby also suggested that by relying on grammar check, her students “won’t have to think about that, so it’s taking away from what [they] learned earlier.” These participants expressed concerns that their students may not learn the skills necessary if they over rely on the digital technologies to do the work for them.

Loss of motivation. Another theme mentioned by three (30%) of the participants was student loss of endurance or motivation for learning. Lucy suggested that students are “less willing to read longer things now since they’ve been reading short things on computers for so long.” Similarly, Michelle also suggested that because of technology, “our kids are skimming as opposed to really reading something.” Lori discussed her perspective that technology can take away a child’s motivation, when she observed, “It [text to voice applications] takes away the incentives to read or write. I know when I was

little, if I picked up a book and I didn't know what those words mean... I worked harder to make sure I could read it." These participants felt that using digital technologies could cause their students to lose their motivation or persistence in learning.

Losing ability to recall. Two (20%) of the participants were also concerned about students losing recall ability. Nina suggested that learning through technology will "just be short term, like a couple of hours remembering, and it's not going to stick with them." Doug suggested, "People are losing the ability to recall something off the top of [their] head." Lastly, one (10%) participant suggested that using technology might promote laziness. Gabby stated, "Kids try to get out of doing as much as they can at certain ages, so [give] them the option to not do it and I'm sure they'd take that option." These two participants are concerned that using digital technologies may effect a student's ability to recall information.

Technology takes away from content. Lastly, two (20%) of the participants cited the concern that technology can take away the lesson focus from the content, and instead turn the focus to the use of the technology. While this theme was only cited twice across the interviews, it is important to explore all of the ideas the participants mentioned. Gabby simply stated, "I think if too much technology is integrated too soon, I think it takes away from the curriculum." Lucy also mentioned this concern with this assertion, "I think that we need to be careful that it's adding to curricular value and not just a bell and whistle." She also continued, "I really think that we need to be sure that technology is adding to educational value and not just doing something in a different way." These two participants see the potential for the technology to overshadow the content of the lesson and the associated activities.

Complicate a teacher's job. The second theme to appear amongst the negative perceptions data is that using digital technologies may complicate a teacher's job. This theme was cited by eight (80%) of the participants with 20 references across the data. This theme represents 36% of the perceptions data and 7% of the total data. Within this theme four codes were used, namely: (a) internet safety; (b) distractions; (c) ineffective implementation; and (d) time waste.

Internet safety. Four (40%) of the participants mentioned Internet safety concerns; there were six references across four interviews. Those four participants all expressed concern over not being able to control or monitor the information or media their students may encounter. Lori expressed these concerns, noting, "It's hard to tell what's good and what's not good, what's student-friendly and what's not student-friendly." She also expressed that "if you don't do your work ahead of time, you run the risk of encountering things that should not be in the classroom." Lucy also expressed concern over making sure her students "have the resources to figure out how to use technology appropriately" and the ability to do the "appropriate monitoring while using it." Michelle expressed concern over not being able to monitor students' activities on their cell phones if they use them as a tool in class: "I personally am very wary of having them use their personal cell phones... that's so hard to monitor." Lastly, Gabby questioned the validity of information online: "Anyone can write anything [online] and it can be wrong." These four participants expressed strong concerns regarding student safety while using digital technologies.

Distractions. Four (40%) participants mentioned that using technology in their classroom could potentially cause distractions. Similarly to Internet Safety, this code was

referenced six times across the four participants' interviews. Doug offered that not knowing whether his "students are using [technology] for school or if they're not paying attention and they think it's a distraction" is a challenge to technology use in the classroom. Lori expressed hesitation concerning technology use in elementary school classrooms: "I think for elementary kids it would be more of a distraction than anything." She also added, "I would imagine teachers spend more time chasing people away from the [Smart] board with markers." Reese also mentioned that allowing students to bring their own mobile devices to class would likely cause a huge distraction because "you don't really know if they're texting or taking pictures or if they're doing what they're supposed to do." Nina had several reservations about using technology in her future instruction. She expressed her skepticism when she said that students "will likely go off and they won't pay attention," and "while it may get a student's attention, it won't necessarily hold their attention for very long." She summed up her thoughts thus: "I've heard about kids being able to bring their own devices, but I don't know about that so much because you don't really know if they're texting or if they're doing what they're supposed to be doing. I think that could be a huge distraction." Using their experiences, these participants expressed concern that technology would have a negative impact on classroom dynamics by distracting students from learning.

Ineffective implementation. Three participants (30%) discussed the idea that technology is not always being implemented effectively in classrooms; this was referenced six times across three interviews. Doug mentioned being somewhat disappointed in the implementations he has seen, "the examples I've seen in class... is (sic) no more than like posting some things and trying to reply to people's posts...that's

nothing revolutionary.” Lori mentioned that she thinks technology has a great potential, but she thinks it is being highly underutilized in classrooms, “It has the potential to be really, really helpful but I don’t know that it’s utilized well. I think we give it to these teachers but the teachers don’t have training on how to use it...I’ve not encountered a lot of teachers who are really effective with it.” For her, the appropriateness of using technology in literacy instruction comes down to whether the teacher knows how to use it effectively. Reese shared a similar sentiment, “it just really depends on how the teacher uses it, because if the teacher just sits them [students] in front of their computer all day and says ‘Ok learn from this,’ I don’t think it will be as effective as the teacher directly teaching them but using the technology to reinforce what they’ve learned.” While this theme may not directly be a perception, it is important to note because these teachers form their opinions or perceptions based on their previous experiences, which, in this case are examples of ineffective implementation.

Time waste. Lastly, one (10%) participant mentioned that learning to incorporate technology into literacy instruction would be a waste of time. Lori posited that preparation time would be increased because she would not only need to learn how to use each application, she would also need to figure out how to incorporate them into lesson plans. She points out that keeping a student’s safety in mind requires her to sift through a lot of information, and that act is going to “bog [her] down.” As the least frequently discussed topic, it is a minor concern to the participants. This may be because these preservice teachers are not yet fully aware of the preparation required to plan a lesson at this point in their programs.

Outside of their comfort zones. The last theme discussed within negative perceptions discusses the idea that using these digital technologies may be pushing these preservice teachers too far from their comfort zone. This theme was cited 15 times by 4 (40%) participants. This theme represents 27% of the perceptions data and 5% of the overall data. Within this theme, three codes were used: (a) human element; (b) technology is unnecessary; and (c) preferences for print based texts.

Human element. Three (30%) of the participants indicated that using technology would remove the human element from teaching. While only three participants mentioned it, this theme was one of the more frequently cited negative perceptions; it was mentioned eight times across those three participants' interviews, representing 18% of all negative or neutral perception coded passages. Lori made several statements regarding her concern about losing the human element of teaching when she said, "It removes the socialization aspect... it removes that person-to-person aspect of our education," and "I think if we put too much technology in the schools, then the kids are just going to have their head buried in their computer all day." She also said "I think the biggest danger of having technology in the classroom is we remove those critical interactions between students and teacher and teacher and administration and administration and students and it's just everybody living in this virtual reality and they don't know what to do." Lori also expressed the idea that "we want the machines to take our place, but we still want the job as the teacher. We want to put the computer in the front of the classroom and make it responsible for the learning and then when the learning doesn't happen, we're like 'oh well, you know that wasn't a very good program.'" Nina also stated, "I think more kids will try to learn languages through a television set or computer games than actually..."

listening to what's going on around the house or what people are saying, they're more focused on how it's being pronounced on the television." She also mentioned that she feels as though learning should be "more from the home environment than the television environment." Lastly, Sean had a more neutral stance on this idea: "it's less personal to me, but it may be more personal to them since that seems to be how relationships are built these days. The younger kids, it's a lot more face-to-face and I guess more fingertip-to-fingertip." The participants who discussed this theme felt very strongly that technology should not be replacing the teacher and retaining that person-to-person connection is imperative.

Technology is unnecessary. Two (20%) of the participants simply did not see technology as necessary. There were three references to this idea across two interviews. Nina asserted that she did not use technology growing up, so she does not feel that her students will need it: "Well because I didn't have a lot of technology use until ninth grade I didn't necessarily see it as a need. In elementary, middle and even high school, it wasn't completely necessary." Sean expressed that he does not personally champion technology use in the classroom, but he realizes it is necessary for his future instruction:

I don't think it's necessary. I don't think there's any benefit from it, outside of its where the kids are comfortable. It tends to be a sloppier genre, technological communications tend to be more haphazard and more spur of the moment than I think requiring any skills. It's more of a stream of consciousness. It's actually frustrating to me to think that instruction is going to have to happen in a stream of conscious (*sic*).

While neither of these participants see the need for technology, Nina and Sean take two very different stances on it. Nina would like to keep her classroom free from as much technology as possible. Sean would also like to keep the technology to a minimum, but he sees that including it in curricula will be a necessity.

Preferences for print based texts. Lastly, two (20%) of the participants mentioned that they each have a personal preference for print text over digital text. There were three references across two interviews. While this is the least represented (6%) code across the negative and neutral perceptions, it is the only theme that directly relates to literacy and literacy instruction. While not necessarily against digital text, Reese herself is “a fan of physical books as opposed to like Kindles.” Nina took a stronger stance in her discussion of print versus digital text, when she stated, “If I was the teacher, I wouldn’t personally let my students use computers in the classroom, and I would try and do a lot of paper notes.” She also stated that she prefers writing on paper as “paper is better.” She also added, “I think being able to write something down on paper and taking notes without computers helps people to remember it long term.” Again, this topic may not directly be a perception, but it is important to identify. A personal preference for print versus technology may have an impact on a teacher’s general perception of technology and/or his or her future decisions made in the classroom.

Overall, the participants had some very valid concerns regarding using technology in their future literacy instruction. See Table 9 for the layout of themes within negative perceptions and see Table 10 for the complete layout of the data representing this theme and the distribution across participants. Negative and neutral perceptions represented only 26% of total perception data (see Figure 3), which suggested that these preservice

teachers were not overly negative about using technology in future instruction; however, their concerns must be addressed in their teacher education programs.

Table 10

Negative or Neutral Perception Themes across Participants

	# of Participants	Frequency Total	Aaron	Doug	Gabby	Jill	Lori	Lucy	Michelle	Nina	Reese	Sean
Negative Effect on Learning	7	21	0	2	6	0	7	4	1	1	0	1
Complicate a Teacher's Job	8	20	0	2	1	0	11	1	1	2	2	0
Outside of Their Comfort Zones	4	15	0	0	0	0	5	0	0	7	1	2
Totals			0	0	0	0	5	0	0	7	1	2

Research Question 2

What conditions do entering these preservice teachers anticipate regarding the use of digital technologies in literacy instruction?

- a. What barriers do they anticipate regarding the use of digital technologies in literacy instruction?
- b. What facilitators do they anticipate they will need regarding the use of digital technologies in literacy instruction?

Perceived Barriers

Overall, there were two different themes that related to the different barriers preservice teachers anticipated they would face when trying to incorporate digital technologies into their literacy instruction. The total coded passages for perceived barriers is 38. See Table 11 for the layout of themes across the perceived barriers data. The themes in order of frequency were: (a) school based and (b) teacher based..

Table 11

Perceptions of Future Barriers Themes

	School Based	Teacher Based
# of Participants	9	9
Frequency Total	21	17
Percentage for Barriers Data	55%	45%
Percentage for total data	7%	6%

School based. The most frequently cited theme for perceived barriers discussed barriers that were school based and thus out of the teacher's control. This theme was discussed by 90% ($n = 9$) of the participants with a total of 21 references throughout. This

theme represents 55% of the perceived barriers data and 7% of the total data. Within this theme three codes were used: (a) access; (b) attitudes; and (c) school policies.

Access. Eight (80%) of the participants mentioned not having physical access to technology as a potential barrier that would limit future implementation. This code was discussed 14 times across those eight interviews. Five of the participants expressed concern that students would have unequal outside access to digital technologies outside the classroom, which would affect opportunities to learn and practice content. For example, Jill mentioned, “there’s still pockets of the population that just don’t have that computer and Internet at home, so finding ways to identify those kids... and finding ways to get it to them [would be a problem].” Similarly, Nina stated, “you can’t tell every kid to bring an iPad if they are not financially stable enough to bring that in,” and “maybe the school isn’t able to equip every single one of your students with...the technology that they would need, so availability would be a big barrier.” Aaron also saw access as the most significant barrier: “the income of the students and accessibility would be the biggest problem.” Doug agreed that “not everyone has a laptop or smartphone, you just can’t count on that.” Lucy also saw student access as a potential barrier: “If you have students of a lower socio-economic level [they] might not have the same access to technology at home all of the time.” Other participants also discussed not having the technology they would need in their schools due to budget or IT issues. Michelle said, “we would need to have access to laptops for certain things.” Jill mentioned that the “first roadblock would be the budget,” and “we’re limited by the amount of money our schools get and what they’re willing to spend it on.” Reese discussed the problem of maintenance: “one thing would be malfunctions with the technology, if I plan a whole

lesson around a certain thing working and it decides to crap out.” Lori said, “I think it really boils down to what the school system has available.” Lucy had a similar feeling when prompted to identify a barrier: “I guess access...if you want to incorporate a certain technology and it’s not available.” Eight (80%) participants discussed access as a potential barrier, making it the most frequently cited perceived barrier the preservice teachers foresaw having to work around.

Attitudes. Three (30%) participants indicated that different attitudes would present a barrier limiting technology inclusion. When asked what factors might limit her technology implementation, Jill discussed students’ attitudes as a possible factor: “[student] attitudes you know, you gotta create some enthusiasm in your classroom.” She also discussed school boards and parents as potential barriers “the school board tells you that you need to do one thing and parents...tell you to do another thing.” Michelle discussed her own attitude as a potential limiting factor. She indicated low self-efficacy for being able to effectively implement technology when she observed, “I just don’t think I’m in the best place to create really awesome presentations for the kids.” Sean also discussed his discomfort with technology inclusion as a potential barrier when he stated, “[it] actually kind of scares me a bit, I’m not nearly as comfortable as the kids are going to be with it.” These participants discussed that different attitudes from either students, parents, administrator’s or even their own may be a future barrier.

School policies. Lastly, one (10%) participant discussed school policies as a barrier to future implementation. When asked about possible barriers, Doug responded, “I think you know school policy...if schools have like blanket policies on cellphones or bringing your laptop to class.” While there is only one reference regarding this concept in

all of the data, it is important to include as it could impose significant limitations on a preservice teacher who might consider using personal devices in his or her classroom.

Teacher based. The second theme discussed within perceived barriers all relate to barriers that are teacher based that each teacher has some level of control over. This theme was discussed by 90% ($n = 9$) of the participants with 17 references across those nine interviews. This theme represents 45% of the perceived barriers data and 6% of the overall data. This theme included 3 codes, namely, (a) lacking knowledge, (b) classroom management, and (c) extra burden.

Lacking knowledge. Seven (70%) of the participants indicated that not having the proper knowledge, technological and/or pedagogical, to effectively incorporate technology in their literacy instruction would be a future barrier. This code was cited eight times across seven interviews. Six of those participants mentioned that teachers needed better knowledge of technology and how an application or device works before even considering using it in the classroom. Lori expressed her personal concern with this statement: "I just need to learn how to use it first...my challenge is learning how to use it effectively." Michelle also stated, "my whole technology efficacy would be a barrier. I really need to step up my game, with that I mean I definitely struggle." Sean expressed a similar concern: "I think pretty much just being behind the level of the kids and [them] being able to go faster than I can go to actually maximize the means of the technological instruction. They can jump ahead before I can even upload any of the work." Gabby also cited this concern: "I think if I don't keep up with technology then I'd be more worried to make a bigger jump...like say I didn't update anything for a long while, that would make me a little nervous to completely change everything I've known and completely switch to

something else.” Reese also acknowledged that she does not “really know a lot of what’s available.” Another idea was raised by Lucy, who saw the role of teachers changing, thus requiring them to “[learn] to be a facilitator, instead of an instructor.” She continued that “some of these kind of learner-based applications you know, it just really changes the role of the teacher from educator to facilitator... a challenge for me is learning when to play which role.”

Lastly, Doug discussed not having the pedagogical knowledge to effectively incorporate technology into his instruction as a future barrier. He said that he would need to “know about implementing it in general, like what exactly can meet the technology.” Having a positive perception of technology inclusion in literacy instruction is a good first step, but if preservice teachers do not know what to use or how to incorporate it into their instruction, their future inclusion of technology will be limited.

Classroom management. Five (50%) of the participants expressed concerns that classroom management would be a barrier to future implementation of technology in instructional practices. Across these five interviews, classroom management was cited as a potential barrier five times. Michelle expressed a need to ensure student monitoring: “when you have a class of kids and you’re like ‘go ahead and look this up,’ you know, I can’t see all of their screens and I don’t know if they’re sending a text to their friends.” She “take[s] issue” with “any kind of that personal technology.” Reese expressed a similar concern: “If they bring their own devices, the fact that they could be distracted or off-task and I might not even know it... would be another [problem].” Nina suggested, “a lot of kids would probably go off topic or not necessarily stay on course with the subject... they’ll go to different social medias and not really focus.” Lori also saw

technological devices as a potential problem: "I'm not a fan of the idea [Smart Boards in elementary school], I think in sixth grade they still need to be interacting rather than reaching over and trying to press buttons on somebody else's computer." Disengaged students can quickly lead to a classroom management problem, and Lucy recalled experiencing this: "I'm observing right now, and I can see that when the tablets come out...they do seem less likely to engage with the teacher." Half of the participants felt that classroom management would be a potential barrier to incorporating technology into future literacy instruction, as was also discussed as a negative perception of technology usage.

Extra burden. Three (30%) participants indicated that a barrier limiting the inclusion of technology was the extra burden it would place on both themselves and their students. While this code was cited relatively infrequently, only three times, it is an important one relating to their perceived barriers. Lucy stated that "they [students] are not proficient, and it's just an extra layer that you need to catch that student up to speed on the technology before you can teach the lesson." Reese also discussed the extra burden technology could impose on her instruction as a barrier when she stated, "Some of them might not really understand how to use it. I guess that would just be a whole 'nother (*sic*) lesson that I'd have or lessons that I'd have to incorporate into my year." Lori saw the extra time and effort needed as a barrier as well: "It's a lot of information you have to sift through and you have to be a hundred percent aware, constantly checking to see what my students want... that's just gonna bog me down." Being a new teacher is stressful enough and these three preservice teachers perceive technology inclusion as an added burden that they do not feel ready to handle.

In summary, these preservice teachers discussed several factors that could limit their technology implementation in their future instruction. See Table 12 for the complete layout of the data for this theme. The most frequently cited barrier, School based, is not a factor that teacher education programs can effectively address because the school environment is different in every school and it is impossible to be able to anticipate the different environments each preservice teacher will find themselves in. While they listed several possible barriers, these preservice teachers also identified factors that could support their future use of technology in instruction.

Table 12

Perceptions of Future Barriers Themes Across Participants

	# of Participants	Frequency Total	Aaron	Doug	Gabby	Jill	Lori	Lucy	Michelle	Nina	Reese	Sean
School Based	9	21	2	2	0	8	3	1	2	1	1	1
Teacher Based	9	17	0	1	2	0	4	3	2	1	3	1
Totals			2	3	2	8	7	4	4	2	4	2

Anticipated Facilitators

There were 31 total coded passages for anticipated facilitators. This category related to the participants' perceived supports needed for incorporating technology within

their future literacy instruction. Overall, there were five themes discussed related to anticipated facilitators. They were: (a) need for ongoing teacher development, (b) community supports (c) IT help, (d) safety supports, and (e) increases access. The data are displayed in Table 13.

Table 13

Perceptions of Future Supports Needed Themes

	The Need For Ongoing Teacher Development	Community Support	IT Help	Safety Supports	Access
# of Participants	7	3	3	2	1
Frequency Total	16	6	4	4	1
Percentage for Future Supports Needed	52%	19%	13%	13%	3%
Percentage for Total Data	6%	2%	1%	1%	>1%

Need for ongoing teacher development. Seven (70%) participants mentioned the need for ongoing teacher development either through professional development or simply gaining knowledge. This theme is the most frequently cited theme within the category of Supports Needed; there were sixteen references across seven interviews. This theme

represents 52% of the perceived supports data and 6% of the total data. This theme utilized two codes, (a) professional development, and (b) knowledge.

Professional development. Six (60%) of the participants discussed needing professional development to help support their inclusion of digital technologies into their literacy instruction. This code was referenced ten times through these six interviews. All of the six participants who referenced this code indicated needing some type of professional development that would provide them with the knowledge and assistance needed to incorporate technology effectively into their literacy instruction. Gabby expressed interest in “a workshop where someone comes in and teaches you how to use it,” as well as “a summer program where you can go in, learn it, maybe try it out on a small group to see what works to see what you can do.” Michelle also said, “I would love workshops, if workshops were made available to me... I would be really, really thrilled to take advantage of those.” Lucy shared the same sentiment: “I would jump at the chance for any sort of professional development subject-specific technology.” Reese mentioned that she could use “some sort of instruction.” Doug said that he “would like to see it, you know done in like an effective way, I mean there’s classes.” Lori made several references to wanting professional development and needing “hands-on training from someone who knows, who knows how to do it, and preferably someone in my field.” Six (60%) of the participants, rather enthusiastically, indicated that they would like to have professional development opportunities to support technology inclusion in literacy instruction.

Knowledge. Four (40%) participants indicated that having knowledge about technology and/or pedagogy would support their future implementation of technology in their literacy instruction. This support was cited six times across four interviews. Doug

stated that he needed examples of implementation: “I would like, you know, examples, with like, you know, and items that are available, like exactly how can you do it.” Sean would also like to be informed by “something like a blog...or newsletter that would come out to get us up to speed as to what was going on with technological advances. What are kids playing with and what we need to look out for.” Lori would like the knowledge required to “incorporate curriculum standards into that education.” Lucy stated that she was interested in “learning how to use technology specifically for literacy” and “hearing about studies that have actually been done that show how effective certain things are and how effective they aren’t.” While this topic is similar to the previous topic, professional development, these participants indicated they simply wanted knowledge (either technological or pedagogical) regarding effective technology inclusion, whereas participants citing professional development specifically indicated wanting a course or workshop to attend.

Community supports. This theme was references by three (30%) of the participants with a total of six references. This theme represents 19% of the perceived supports data and 2% of the total data. These participants indicated that having a supportive community, at home and school, would help them in their future instruction. This theme was cited six times across three interviews. All three participants, Gabby, Jill and Sean, discussed having a supportive teaching community available to support their technology inclusion. Gabby said, “I certainly wouldn’t want to be the only one changing completely, I’d want someone to be in the same boat as me.” Sean agreed: “I think having other experienced teachers to work with around would help a lot.” Jill also saw power in “finding partnerships with other teachers or businesses outside of the schools

that can help provide some technology.” Jill also discussed needing the support of parents and being able to “...get them interested... so the parents could access and see what [their] kid’s doing.” As with most anything, when starting something new in a classroom, it is imperative to have a supportive community. These participants indicated that they feel that they would need a supportive community to back their instructional decisions to incorporate technology into their literacy instruction.

IT help. The next theme was references 4 times by three (30%) participants. This theme represents 13% of the perceived supports data and 1% of the total data. These participants indicated that having IT support available would facilitate their future implementation of technology in literacy instruction. Across the three participants, this theme was cited four times. All four participants discussed needing access to IT help to assist with technological problems. Aaron stated that he would need “IT support for the classroom, for both teacher and students.” Michelle agreed, stating, “I think it’s really fantastic when there’s a specific kind of tech person on board at the school who like checks in and out the laptops...but also can help you if you need it.” Reese felt that “someone who knows how to fix it if it malfunctions” would help support her technology usage, as well as having “somewhere to call if I do need help...” These participants indicated wanting a person who would help them as needed when they were having problems with the technology they planned to use for instruction.

Safety supports. This theme was discussed four times by two (20%) of the participants. This theme represents 13% of the perceived supports data and only 1% of the total data. The two participants discussed needing safety measures, such as having the ability to monitor and control what their students are doing online, in place to help

support future technology inclusion in their literacy instruction. Safety supports were cited four times across two interviews. Aaron expressed wanting “access to the students’ computers through a program that would allow the teacher to have control and help [monitor] student activities.” Citing safety supports three times in her interview, Nina felt strongly about needing safety supports to facilitate technology inclusion in her literacy instruction. Nina recalled a teacher using a program that allowed him or her to access and monitor the websites students accessed: “I think that would be almost necessary in order to see if the students are set on-track, and if that wasn’t available there was like another person in the room to make sure students aren’t going off from what they were supposed to do.” Nina also added, “I would like to have certain social media blocked on the technology they were given.” Lastly, she stated, “at a certain age [they] will start to search like provocative websites, obviously those would be blocked in a school setting.” In order to maintain control and ensure the safety of their students, these participants discussed needing the ability to monitor and/or control the student activity online.

Increased access. Lastly, this minor theme was discussed by one (10%) participant with one reference. This theme represents 3% of the perceived supports data and less than 1% of the total data. This participant indicated the necessity to ensure access within the community as a support. Aaron was concerned about students having access to technology outside of school, so he felt having “hot spots throughout the community” so students could “have access and get ahold of me” would be a necessary support for successful inclusion. This participant saw that his students would need increased access outside of school if he were to successfully incorporate technology into

his literacy instruction. While this is a very minor theme, it is important to expose all ideas discussed by the participants within this study.

In summary, this section represents several supports the preservice teachers felt would help them incorporate technology into their future literacy instruction. See Figure 8 for the complete layout of the data for this theme. Most of the supports mentioned are things they would likely find in their future school districts.

Table 14

Perceptions of Future Supports Needed Themes Across Participants

	# of Participants	Frequency Total	Aaron	Doug	Gabby	Jill	Lori	Lucy	Michelle	Nina	Reese	Sean
Need for Ongoing Teacher Development	7	16	0	3	2	0	5	3	1	0	1	1
Community Support	3	5	0	0	1	4	0	0	0	0	0	1
IT Help	3	4	1	0	0	0	0	0	1	0	2	0
Safety Supports	2	4	1	0	0	0	0	0	0	3	0	0
Access	1	1	1	0	0	0	0	0	0	0	0	0
Totals			3	3	3	4	5	3	2	3	3	2

Chapter Summary

The first research question explored preservice teachers' perceptions of using digital technologies in their future literacy instruction. Positive perceptions were discussed much more frequently, representing 74% ($n = 160$) of the total perceptions data. Positive perception themes discussed included: using digital technologies to provide quality instruction, recognition that the future includes adapting to innovation and change, and using digital technologies to connect within a digital world. Negative or neutral perceptions represented 26% ($n = 56$) of the total perceptions data. Negative or neutral perception themes discussed included: using digital technologies can cause a negative effect on learning, using digital technologies can complicate a teacher's job, and outside of their comfort zones. These themes discussed for this research question bring many different ideas to preservice teachers' perceptions. They discussed many positive themes encouraging the use of digital technologies within literacy instruction. However, they did bring up several important concerns regarding using digital technologies in their future literacy instruction.

The second research question explored preservice teachers' perceptions of the future barriers limiting their inclusion of digital technologies into literacy instruction and the perceived supports they would need to facilitate inclusion. Perceived barriers themes included: school based barriers and teacher based barriers. Perceived supports themes included: the need for ongoing teacher development, community supports, IT help, safety supports, and increases access. The discussion of perceived barriers and supports helped to give a more complete picture of each participant's perceptions of using digital technologies in their future literacy instruction.

Chapter Five

As the intersection of new literacies and ICT is very new, there are several problems with regard to the implementation and research behind it. It is challenging to generate new knowledge when the nature of literacy changes faster than can be articulated and developed (Leu et al., 2013). Researchers struggle, therefore, to stay abreast of developments in order to inquire how ICT can best facilitate learning new literacies. The research that has been done on technology in literacy instruction and preservice teachers' perceptions is composed of small-scale qualitative exploratory studies (Burnett, 2011; Connors & Sullivan, 2012; Ertmer et al., 2012; Karchmer, 2001; Kim et al., 2013). These studies explore what teachers are doing and how they are implementing these strategies into their literacy instruction (Coiro & Dobler, 2007; Katić, 2008; Wolsey & Grisham, 2007). Even though there is useful work on practicing teachers, there are as yet few studies exploring preservice teachers' perceptions (Al-Hazza & Lucking, 2012; Burnett, 2011; Chen, 2010; Sang et al., 2010), and none specifically discuss technology in literacy instruction. It is important to understand the perceptions of preservice teachers, as they are the next generation of teachers. Many of these aspiring teachers may have grown up surrounded by technology, but they likely did not receive instruction with it as P-12 students. This determination led to the research questions that are the focus of this study.

Research Questions

The purpose of this study was to explore preservice teachers' perceptions of ICTs in literacy instruction. Specifically, this study aimed to answer two questions:

1. What are entering preservice teachers' perceptions of the role of technology in literacy instruction?
2. What conditions do entering preservice teachers anticipate?
 - a. What barriers do they anticipate regarding the use of technology in literacy instruction?
 - b. What facilitators do they anticipate they will need regarding the use of technology in literacy instruction?

The purpose of this chapter is to summarize findings and to discuss implications for practice and for teacher education programs. This chapter will discuss the findings for each research question, interpret the findings in light of the literature reviewed in Chapter 2, identify limitations of the present study, and suggest directions for future research.

Conclusions

The first research question investigated the perceptions of entering preservice teachers regarding the use of digital technology in literacy instruction. To address this research question, ten participants were interviewed, and their perceptions were explored regarding the use of digital technology in their future classrooms.

Looking across the data to compare the frequency counts of the positive and negative perceptions, it is important to note that positive perceptions are discussed more frequently than negative perceptions. Positive perceptions were discussed a total of 160 times across all of the data, whereas negative perceptions were discussed only 56 times

across all of the perception data. Positive perception themes represented 74% of the perception data, whereas the negative themes represented only 26%.

Positive Perceptions

Overall, the participants had generally positive perceptions regarding using digital technologies in their future literacy instruction. Three themes appeared within the positive perceptions data, using digital technologies to provide quality instruction, recognition that the future includes adapting to innovation and change, and using digital technologies to connect within a digital world. All participants discussed using digital technologies to provide quality instruction citing either access to information, instructional practices, engaging students, improving learning, convenience, or assistive technology. Specifically, 70% percent ($n = 7$) of the participants indicated that technology facilitates access to information in new and exciting ways. They discussed being able to access information more quickly than they had in the past. Six (60%) participants also stated that they technology could positively impact their future instructional practices. While many of their descriptions simply used technology as a replacement for a more traditional paper-based task, and not in a more transformative way, it must also be remembered that these teachers did not necessarily have the technology-based educational experiences with which to imagine any activities outside of their own paper-based experiences. Most of the participants (60%), also indicated that they believed using digital technologies would impact student engagement in their future classrooms. While they were just starting their professional education programs, they did already seem to know that student engagement is vital to instruction and could foresee using digital technologies in their future literacy instruction to help engage their students.

Eighty percent ($n = 8$) of the students made recognition that the future includes adapting to innovation and change by discussing ideas about real life application, embracing change, or using technology in innovative ways. Specifically, half of the participants indicated that using digital technologies would help prepare their students for the future and better prepare them for real life application down the road. Lastly, seventy percent (70%) discussed using digital technologies to connect within a digital world. Specifically, 60% ($n = 6$) of these participants also saw that technology could improve their communication, whether with other teachers, their students' parents, or other educators or classrooms across the world. While using digital technologies to communicate other teachers and their students' parents simply uses technology to replace a more traditional mode of communications (i.e.: phone calls, newsletters, etc.), using digital technologies to communicate across the globe brings in a new and potentially transformative way to thinking and teaching into their classroom. Half of the participants also suggested that using digital technologies would help to improve a sense of community within their classroom either by making better connections within their school community or even reaching out across the globe and making worldwide connections to foster a global community. Within the three themes, there were several ideas including, embracing change, improving innovation, using digital technologies for convenience, assistive technology, and using digital technologies to improve collaboration, that were held by a minority of the population. While they were not the dominant ideas, it is important to point out that these were positive statements held by at least some of the participants. If these represent ideas that preservice teachers are beginning the programs with, even if

they are in the minority, it gives a very positive look at their openness to integrate these ideas into their future classrooms.

Negative Perceptions

While the majority of the statements were positive, the participants did indicate several concerns about using digital technologies in literacy that are important to address. Three themes appeared throughout the analysis, using digital technologies could have a negative effect on learning, using digital technologies may complicate a teacher's job, and take them out of their comfort zone. Across these three themes, only one concern was discussed by the majority of participants, using digital technologies could have a negative effect on learning. Seventy percent (70%) of the participants mentioned that using digital technologies may have a negative effect on learning. For example, several of these preservice teachers expressed the opinion that autocorrect or spell-check may limit the development of spelling skills, and some participants discussed topics such as overreliance on digital technologies or losing sight of the learning goals as a result of a technology focus. The remaining codes that presented themselves were discussed by the minority of the participants. Forty percent of the participants suggested that using digital technologies could impact classroom management and create a distraction. Thirty percent felt that using digital technologies could remove the human element from teaching and that digital technologies are often implemented ineffectively. Four remaining codes were discussed by a minority of the participants: (a) takes away from content (20%); (b) teacher may become unnecessary (20%); (c) prefers print based texts (20%); and (d) using digital technologies will waste time (10%).

Perceived Obstacles and Challenges

To address this question, the preservice teachers were asked to discuss what factors they felt might limit them from integrating digital technologies in their future literacy instruction. The results of this investigation uncovered two themes, school-based barriers and teacher-based barriers. School-based barriers were discussed by 90% of the participants and included access, attitudes and school policy as being possible barriers. Specifically the majority of the preservice teachers, 80%, felt that a lack of access to digital technologies could limit their future instruction. Teacher-based barriers were also discussed by 90% of the participants and included a lack of knowledge, classroom management concerns, and using digital technologies might create an extra burden. Specifically, the majority of students (70%) discussed that their own lack of knowledge about using the digital technologies and/or teaching with the digital technologies would limit integration in their future literacy instruction. This finding led to the speculation that even though preservice teachers may be open to including digital technologies in their future literacy instruction, not knowing how to use them or especially how to teach with them are two perceived obstacles.

Another concern was classroom management. Half of the participants discussed classroom management as a limitation to their implementation. As classroom management generally has been found to be a top concern of preservice teachers (Reeves-Kazelskis & King, 1994), adding in the uncertainty of including the Internet and different digital technologies surely adds to concern. They discussed concerns that using digital technologies would affect classroom order by distracting the students, affecting student engagement, and detracting from teacher ability to monitor student activity.

Lastly, there were several ideas that were discussed by a minority of participants: (a) attitudes of students, peers, administration and/or parents (30%); (b) the extra burden (30%); and (c) school policies (10%) as limitations to inclusion. While only a few participants discussed these as potential barriers, they are important to note for other researchers who are interested in this aspect of preparing teachers for connected schools and curricula.

Perceived Supports

In addressing the question of perceived supports available to teachers to encourage technology integration into literacy instruction, the preservice teachers were asked to discuss supports they might need to help them facilitate the integration of digital technologies into their future literacy instruction. Since 70% of the participants indicated that lacking knowledge would be a burden, it is not surprising that the most frequently cited theme was a desire for professional development and both technological and pedagogical knowledge; this was discussed by 70% of participants. This suggested that while these preservice teachers wanted to incorporate digital technologies into their instruction, they were also aware that they would need professional development to learn how to use digital tools as well as to understand how to incorporate digital technologies into their instruction effectively.. Four other themes were discussed by a minority of the participants: (a) needing community support (30%), (b) needing IT help (30%), (c) needing internet safety supports (20%), and (d) needing access to digital technologies (10%).

Ancillary Findings

During the analysis, three other findings outside the research questions emerged from the data. While these findings are general, and do not include the majority of the participants, they are unique enough to be noteworthy and possibly warrant future research and exploration. The first is that age is not necessarily a predictor of future technology use, but it may in fact influence perceptions of technology usage in literacy instruction. The second suggests that having a negative perception does not necessarily indicate that a preservice teacher does not foresee using technology in literacy instruction. The third brings to light the observation that during the interviews several of the preservice teachers' perceptions changed from initially resistant to eventually accepting by the conclusion of the interview.

Age is not a predictor, but it is an influence. While examining the data, it became quickly apparent that two participants, Jill, who is the oldest (42) of the participants, and Nina, who is the youngest (19), had opposing views about using technology in literacy instruction. Jill's extremely positive views about technology directly oppose Nina's extremely negative views, and both of them directly contradict the idea that age is a predictor of positive or negative perceptions about using technology in the classroom. When asked why she felt that technology needed to be included in literacy instruction, Jill stated that she thinks "we have to broaden our definition of what literacy is... because our kids, um, the way they view the world, the way they interpret it, uh analyze it, internalize it, is all effected by technology." She also displayed her positive views in vision of her future classroom. She envisioned that "every kid would have a laptop" and they would be filled with "all of the possible programs they could use." She

imagined that her class would be “set up with a network where they could see... their own accounts, save their information and share their information.” She also imagined that every student would have “complete access to a digital library of books” as well as “searchable databases” and “access to a librarian online.” She discussed creating an ever-changing literacy environment by presenting students’ work on “digital picture frames” that would allow it to be “displayed almost like a museum, but the artifacts that are on display change.” She also imagined Skyping in writers, CEOs, or other people who use writing in their jobs to “have the kids interview them.” She described this as “giving them access to the whole world” to “create... and foster this global community.” As the oldest participant, it is very telling that her statements are arguably the strongest statements supporting the use of technology in literacy instruction.

Nina, on the other hand, held an opposing view. As she is the youngest participant, it could have been assumed prior to the study that she would hold a positive view of technology since she has never known a time without it. However, as she explained, she had very few experiences with technology in her education. She explained that she “didn’t have a lot of technology use until ninth grade,” and at that point, she only saw a Smart Board being used. She also felt that “in high school it wasn’t completely necessary,” and she did not discuss any positive educational experiences with technology. When asked about her future teaching she stated: “I wouldn’t personally let my students use computers in the classroom, and I would try and do a lot of paper notes more.” She explained her views thus: “I’m not a technology advocate.” Her intention for her future instruction would be to be “very minimalistic with it.” While both of these participants

used their varied experiences with technology as a basis for their perceptions, their age disparity illustrated that age alone is not a predictor of perceptions of technology use.

Their opposing views directly contradict the controversial idea of digital natives and digital immigrants (Prensky, 2001). Originally, when published, Prensky discussed the idea that students who were born prior to boom of technology would fall into the category of “digital immigrants” and would always be a translation behind the younger generation, the “digital natives”. Several researchers (Bennett, Maton, & Kervin, 2008; Helsper & Eynon, 2010; Jones, Ramanau, Cross, & Healing, 2010), including the author himself, (Prensky, 2009) have argued that this is not an accurate representation, as the data in this present study would also support. Also worth noting, this discussion includes only two of the ten participants, as the remainder of the participants each fall some in the middle of these two opposing views. It is likely that the opposing views of Jill and Nina represent the more extreme views, and the remaining participants represent more of the majority of preservice teachers by holding a more moderate view that falls in between the two extremes.

However, the data do suggest that while age may not a predictor, it can influence future technology implementation. When asked in follow-up questions if younger Millennials, because of their increased exposure to technologies, would be more likely to hold more positive perceptions than the older generations, 67% ($n = 4$) of the six respondents that responded felt this statement to be true in their experiences. Doug explained his thoughts with this statement: “I don’t think your age necessarily determines your perception of technology in literacy instruction, but oftentimes it seems to.” He continued, “in my experience, the older the teacher, the more likely they are to be

technologically illiterate. On the other hand, you're much less likely to run into a young person who isn't technologically proficient." Gabby expressed a similar opinion: "I do think the younger generations have certain adeptness to technology that the older generations don't have...I do feel that I am more likely to use technology than someone who is much older than I am." She posited "that the Millennial will certainly have an easier time navigating the new literacies birthed by advances in technology," and "the ease of access to these technologies and the lack of preconceived notions about pre-internet literacies will also contribute to an overall positive attitude for this generation." Michelle agreed, saying, "I do agree with this statement as technology is a lens through which I, a 23-year-old, see the world...technology is integrated into many of my every day routines and processes in a way that is not the case for my 75-year-old grandmother." Each of these four participants indicated that someone's age would likely impact their perception of technology.

In summary, this finding is rather contradictory overall. On one hand, four of the six participants agreed that age impacts perceptions of technology use. They agreed that younger Millennials will have an easier time implementing technology, and thus more positive perceptions, and the older generations will have a bit more of a learning curve, and thus more negative perceptions. The data also show that it is not accurate to rely on age alone before attempting to predict someone's perception, as the oldest and youngest participants in this study showed opposing views of using technology in their literacy instruction. Thus, these findings indicated that while it is likely that the younger generations may have more positive views of using technology in literacy instruction than the older generations, age alone is not necessarily a predictor for someone's perception of

using technology in literacy instruction.

The inevitability of digital technologies in schools. The second ancillary finding that became apparent when analyzing the data showed that even if preservice teachers hold negative perceptions of technology use, they may still intend to use technology in future literacy instruction. In fact, three participants, Scott, Lori and Gabby, all expressed some very valid concerns regarding using technology in future literacy instruction, but each of them also discussed different ways they intend to use it. As part of the follow-up questionnaire, each of these participants was asked why, despite their concerns, they still anticipated using technology in their future literacy instruction. Sean described technology as “the unavoidable companion to almost everything,” and despite his “reluctance (okay, fear) of integrating the less familiar elements of technology into my instructional programs,” he felt it would be “ludicrous to attempt an education model without it.” Sean also emphasized that “one of the principles of effective education is linking material with students' backgrounds and personal identities, and with so much of these identities existing in the technology world, I will have to foray into said world if I have any designs [sic] on effectively reaching my students.” While Gabby was concerned that too much technology will take the teacher out of teaching, she also expressed an idea similar to Sean's: “we have to move with the times and use technology in our teaching because it will be a way to connect to the younger generations that are more immersed in technology than ever.” She also stated, “I also think I imagine using technology in my class despite my concerns because I know that it will make real world connections for the students.” Gabby also saw technology as a facilitator of independence for her future students: “I can show them that they can use the technology they have to learn more on

their own.” She expressed the desire for her future students “to not think that they can only learn at school, but that they can learn whenever they are curious.” Similarly to Gabby, Lori was concerned that too much technology will eventually replace the teacher, but she also realized that it may be a necessary evil that she must accept: “Currently, the schools are on an upswing of technology use” and “if I (or any other teacher) completely reject using technology, then I put myself in a less likely position to be hired for a job.” She also stated: “whether I like or not, technology is a large part of the classrooms, from Chrome-books and SMART boards to cell phones and calculators” and “I do not have any way around that, so my only option is to learn how to use/live with it.” Lori’s was even more negative than Scott’s or Gabby’s; however, despite their concerns, each of these participants expressed the intention to include technology in their future instruction. While perceptions are very helpful in gauging a preservice teacher’s intentions of future technology use, perceptions alone may not tell the whole story. The data showed that three participants, who each expressed some very valid concerns regarding using technology to teach literacy, all envisioned using technology in their future teaching.

Changing perceptions during the interview. Lastly, while looking across all of the data, the researcher made an observation that was unique enough to warrant a discussion. While the majority of these preservice teachers had generally positive views toward using digital technology usage, at their cores, they seemed to be conservative thinkers who generally aimed to maintain the social order in which they were raised. Essentially, they aimed to teach as they were taught. Dan Lortie coined the term “apprenticeship of observation” (1975) to describe the phenomenon that most teachers aim to replicate their own educational experiences in their classrooms. The term refers to

the fact that these preservice teachers have had 16+ years of education in which they were able to observe their teachers' actions. Unfortunately, one of the consequences of this view is that these preservice teachers may be unaware that their experiences have only given them a partial view of a teacher's job. Dan Lortie explains that the student "sees the teacher front stage and center like an audience viewing a play," and does not get the opportunity to see the "backstage" behaviors that are crucial to a teachers' job (p. 62). For the most part, the results from this study supported this idea, but interestingly, throughout the interviews, some of the participants' perceptions seemed to change as they continued to discuss their ideas, which led the researcher to another observation.

While these participants were being interviewed, they spoke hesitantly or negatively regarding using digital technologies in literacy instruction, but as the conversations went on, their statements became increasingly positive, as though they were realizing the impact these digital technologies could have on their future instruction. The researcher speculated that this may have occurred because these preservice teachers were just entering their programs; they really only had their own educational experiences to inform them. In most cases, these did not include using digital technologies as learning tools. They may have initially imagined teaching as they had been taught, but as the conversations continued, they were able to use their own personal or social experiences using technologies to draw upon and essentially change, or even realize, their own perceptions through the conversation. These preservice teachers used the conversation to think through these ideas, perhaps because no one had asked them about their thoughts on the matter previously. This led to the conclusion that since many of these preservice teachers had generally positive perceptions, they were receptive to the idea of using

technology in their literacy. However, perhaps due to their limited experiences with technology as student themselves, they lacked the context from which to draw. Therefore, it is imperative for teacher education programs to give their preservice teachers the knowledge of and experience using technology to teach literacy in order for them to have practical information to draw upon in their future literacy instruction.

Summary

Overall, this research study yielded many important conclusions. Most promisingly, the large majority of the data was characterized positive, thus implying that the majority of the participants were willing, and some even enthusiastic, about using digital technologies in future literacy instruction. This research also brought to light several important concerns regarding technology use in the classroom that must be addressed by teacher education programs. The participants discussed several valid perceived barriers to technology inclusion. While the main perceived barrier, access, is out of teacher education's control, the remaining barriers are all things that can be addressed within a teacher education program. Two theories also came to light in the analysis of this study. The first theory suggested that while age alone is not a reliable predictor of perceptions, it may influence likelihood that a given preservice teacher's perceptions are positive. This study included two participants on opposite ends of the age spectrum who had opposing views of using technology. Their opposing perceptions showed that one cannot assume how positive or negative a preservice teacher's perceptions about using digital technologies to teach literacy may be based on age alone. This study also showed that while a participant may hold negative perceptions regarding digital technologies in literacy instruction, he or she may still envision using digital

technologies in their future literacy instruction. All participants expressed concerns surrounding digital technologies, but they also realized that their future teaching will need to adapt to include digital technologies in order to remain relevant in an evolving society. Lastly, this study exposed two small, but important, observations during the data collection and analysis. First, while the majority of these preservice teachers were frequent digital technologies users, they were also conservative in their ideas about using it for instruction. They were open-minded to these new technologies, but because of their inexperience with teaching, they did not have any previous pedagogical knowledge on which to draw. Therefore, while they expressed interest in using digital technologies, they did not know how to use them in practice, which caused them to revert back to their more conservative educational experiences. Also, during the interviews, the researcher often observed a participant initially expressing either negative or neutral perceptions of digital technologies, but as they went on in their thoughts and discussions, they became more and more positive, almost as if they were verbally thinking through the process of how they would be using tools. In summary, these results suggest that today's preservice teachers are entering their teacher education programs with open minds about using digital technologies in their future literacy instruction, and it is imperative that teacher education programs prepare them with the knowledge and experiences needed to successfully incorporate digital technologies into their future literacy instruction.

Discussion

The literature discussing preservice teachers' perceptions of using digital technologies is lacking, while literature discussing inservice teachers' perceptions of using digital technologies in literacy instruction is more available. For the purposes of

this paper, the discussions comparing the results of this study to previous research on inservice and preservice teachers will be separated, given that preservice teachers lack the experience of teaching with digital technologies.

Preservice Teachers' Perceptions

The results from this study have several connections to the research that has been conducted on preservice teachers' perceptions of using digital technologies. The review of literature in Chapter two had three categories of preservice teachers' perceptions as follows: (a) preservice teachers' perceptions of using digital technologies for their own personal learning, (b) preservice teachers' perceptions of using digital technologies in general instruction, and (c) preservice teachers' perceptions of using digital technologies in literacy instruction. For the purpose of this review, all of these categories will be included in the discussion.

There are several findings in the present study that resonate with the findings of the 14 studies presented in the literature review. This study found that the majority of preservice teachers interviewed held more positive perceptions than negative perceptions when thinking about implementing digital technologies in their future literacy instruction. This finding is similar to several other studies that showed their participants as having generally positive perceptions regarding digital technology uses, whether for their own personal learning, general instruction, or literacy instruction (Al-Hazza & Lucking, 2012; Baltac-Göktalay & Özdilek, 2010; Eyyam et al., 2011; Gialamas & Nikolopoulou, 2010; Goktas & Demirel, 2012; Hughes, 2013; Martinovic & Zhang, 2012; Sang et al., 2010; Tokmak, 2013). For example, Baltac-Göktalay and Özdilek, (2010) found that their participants' perceptions of using Web 2.0 tools was positive and they expressed intent in

using them for their own learning. Martinovic and Zhang (2012) also found that their participants expressed positive perceptions as well as self-confidence regarding using these digital technologies. In Tokmak's (2013) study, it was evident that participants held increasingly positive views after having more experiences with digital technologies in their teacher education programs. While each of these studies varies from the others in some way, they each found that preservice teachers expressed generally positive views toward digital technology use.

In contrast, there is one study that directly conflicts with the findings of this current study. Kist and Pytash (2015) found a surprising amount of negative perceptions across their participants. Many of their participants struggled with the concept of utilizing digital technologies in their future literacy instruction. They expressed concerns that these digital technologies would be a burden on their teaching and would impose significant inconveniences on them. At this point, we can only speculate on the differences between their findings and those of the present study. While both studies are of preservice teachers' perceptions of using digital technologies in literacy instruction, there are two major differences between these two studies. The Kist and Pytash study utilized different data collected than the current study. The current study used only individual open-ended interviews with each participant, whereas Kist and Pytash worked their study into their coursework by following one cohort of students throughout an entire academic year. They utilized the students' blogs, in-class reflections, and end of semester open-ended questionnaires, along with semi-structured focus group interviews as their data sources. In addition, their data were collected over the course of an academic year while they were completing coursework and conducting classroom observations, whereas the data for the

current study were collected at the beginning of participants' first semesters prior to any coursework or classroom observations. It is possible that these differences could be enough to affect the perceptions discussed, as the participants in the Kist and Pytash study had already had more exposure to teaching literacy with digital tools. It is also possible that their negative perceptions were affected by the overwhelming amount of information and knowledge preservice teachers must digest as part of their programs. They have seen using digital technologies as just another topic they have to learn. The participants in the current study did not have educational experiences that included digital technologies to draw back upon, thus making it potentially more challenging for them to imagine teaching with them. Also, the data collected from these two studies were collected four years apart. The data collected from the Kist and Pytash study were collected during the 2010-2011 academic year, whereas the data from the current study were collected in the fall of 2014. As Kist and Pytash (2015) pointed out at the end of their study, it is highly possible that perceptions may change as different groups of preservice teachers with higher levels of technology experience enter into education programs. In this age of rapid changing technologies, what was once a new concept can very quickly become outdated. As time progresses, the population of preservice teachers will change. It is possible that the participants in the current study, while they entered their teacher education programs only four years after the participants in the Kist and Pytash study, may have had more experiences with technology prior to entering their programs in both their personal lives and their educational experiences. The researcher proposes that the time gap between these two studies is the most likely reason for the

disparity of results. Further research is necessary to determine whether there has been a change in perception from the time of Kist and Pytash's (2015) study until now.

It may be convention to believe that increased exposure to digital technology use in life and in school naturally influences later use in life, but the results from the present study suggest otherwise. As this study, and several other studies (Al-Hazza & Lucking, 2012; Eyyam et al., 2011; Hughes, 2013; Kist & Pytash, 2015) have shown, even if preservice teachers enter into their teacher education programs with significant experience with digital technologies, it is not given that they are prepared for teaching with them. For example, Kist and Pytash (2015) pointed out that it is not fair to assume that preservice teachers will "automatically bring these new literacies through the schoolroom door in groundbreaking ways, just by virtue of their generational experiences" (p. 156). Al-Hazza and Lucking (2012) also found that frequent technology users did not automatically possess the pedagogical information needed to know how to teach with it. Hughes' (2013) reached a similar conclusion: preservice teachers did possess higher digital technology skills than in previous generations, but those skills did not naturally allow them to understand how to teach with technology. Each of these studies concluded that it is imperative that teacher education programs address this directly in the design of the coursework and experiences in teacher education. Teacher educators need to understand that entering preservice teachers may be coming in with experience with digital technologies, but this does not necessarily indicate predisposed willingness to incorporate these tools into literacy instruction.

Lastly, in the present study, there were several participants who expressed concerns about using digital technologies, but intended to push past their concerns and

incorporate digital technologies within their literacy instruction. Larson (2013) had a similar finding. While Larson's participants expressed concerns regarding using digital texts within their classrooms, citing preferences for print, they also acknowledged that teaching their students to read and use digital text was important. They felt that no matter what their preference was, it was important to incorporate technology into their future literacy instruction.

The findings from the present study suggest it is imperative that teacher educators make the necessary adjustments in their programs to provide their preservice teachers with the experiences and knowledge necessary to implement digital technologies into their future literacy instruction with some facility. This finding supports similar results in previous research (Eyyam et al., 2011; Goktas & Demirel, 2012; Hsu, 2013; Hughes, 2013; Kist & Pytash, 2015; Martinovic and Zhang, 2012; Tokmak, 2013). For example, Goktas and Demirel (2012) concluded that preservice teachers must be given sufficient experiences with digital technologies to allow them to make the educational connections they will need for future implementation. Eyyam et al. (2011) also emphasized that it is imperative that preservice teachers be given proper guidance throughout their teacher education programs in order to gain the necessary context to effectively implement digital technologies in their future instruction. In addition, Tokmak's (2013) experimental study determined that it may be possible to change or influence a preservice teacher's negative perception through increased experiences with digital technologies within their teacher education programs. This study is especially important when compared to research done on inservice teachers. Researchers D'Agostino, Rodgers, Harmey, and Brownfield (2015) found that using an early literacy app, LetterWorks, with first graders resulted in

statistically significant gains in alphabetic skills. However, despite these gains, the teachers still expressed reluctance about using the app in the future because it did not line up with their theoretical beliefs that tactile learning was the most important learning format for young children. This study points out the challenge of changing inservice teacher perceptions. Considering Tokmak's (2013) success, the researcher proposes that teacher education may see more perceptions change if students are given the information needed from the start. By the time an inservice teacher has found his or her way to a classroom, he or she has some deeply ingrained perceptions or beliefs. Changing these is a very challenging process that is well documented by previous research (Ertmer, 2005; Ertmer et al., 2012; Hutchison & Reinking, 2011; Kim, Kim, Lee, Spector, & DeMeester, 2013).). This is further reason to emphasize teaching preservice teachers to effectively incorporate digital technologies into their literacy instruction. These studies, together with this current study, each assert that teacher education programs are responsible for preparing preservice teachers to teach with digital technologies.

Implications

The findings from this study have implications for both practice and research on teacher education.

Implications for Practice

Overall, the findings of the present study demonstrate that these preservice teachers held generally positive perceptions about teaching literacy with digital technologies. They also suggest that while these preservice teachers are open to including these tools in their future instruction, they lack the pedagogical knowledge and previous experience to effectively implement them. Their lack of knowledge and experiences

limits their scope and they are unable to envision beyond their previous experiences. Therefore, curriculum developers for teacher education programs must consider the importance of teaching the skills necessary to teach literacy with digital technologies, along with providing adequate experiences to interact with these digital tools and see them being used effectively in instruction. Teacher educators must also provide their preservice teachers the opportunities to learn about and explore changing literacy practices and understand how digital technologies impact the new literacies in schools today. Failure to do so perpetuates the trends found in the research on practicing teachers reported in chapter 2, where underprepared preservice teachers can become practicing teachers who find myriad reasons not to include technologies in their teaching. One role for preservice teacher education is to provide multiple opportunities for teacher candidates to experience the possibilities that come with digital technologies.

The preservice teachers in this study also expressed some serious concerns and misconceptions regarding using digital technologies in literacy instruction. It is the responsibility of teacher educators to expose preservice teachers' perceptions and concerns about the role of digital technologies in schools and in literacy instruction. Without understanding their perceptions, teacher educators may not know what preconceived concerns they may be working against in their coursework. Given that perceptions have a major impact on future behaviors (Pajares, 1992) it is vital that teacher educators treat these perceptions as prior knowledge and make adjustments to their coursework as needed. It is also the responsibility of teacher educators to discuss and address all of the preservice teachers' concerns and possible misconceptions.

In order to achieve this, teacher education programs must also provide their faculty members sufficient access to digital technologies for use in their own instruction, as well as adequate professional development opportunities that allow them to understand how to teach with them themselves. Literacy faculty members must create and be given professional development opportunities to understand and explore what the new literacies are and how they may impact the idea of traditional literacies. Lastly, teacher education programs need to allow for the flexibility to incorporate digital technologies into all areas of the teacher education curriculum. Instead of a stand-alone technology course, incorporating digital technologies into a teacher education program should be a seamless integration of knowledge and experiences scattered throughout preservice teachers' programs. Researchers Ertmer and Ottenbreit-Leftwich (2010) explained this idea thus: "when learning experiences are focused solely on the technology itself, with no specific connection to grade or content learning goals, teachers are unlikely to incorporate technology into their practices (p. 263)." All teacher educators need to not only be given access to digital technologies within their classrooms, but they need to be given the autonomy to make the changes necessary that allow for preservice teachers to gain the knowledge and experiences needed to be successful incorporating digital technologies into their future literacy instruction.

Implications for Research

The findings from this study suggest implications for further research. This study focused only on the perceptions of preservice teachers entering into their teacher education programs. Future research is needed to follow preservice teachers through their teacher education programs and into future teaching positions. This research is necessary

to explore just how teacher education programs can impact someone's perceptions, as well as understanding; if and how perceptions may change once a preservice teacher enters in a teaching position. This information is necessary for teacher educators to understand what knowledge and experiences provided through their programs may impact their graduates' use of digital technologies in literacy instruction.

The findings from this study also suggest that future research should explore what type of digital technology experience influences preservice teachers' knowledge and skill development within their teacher education programs. Right now, teacher education programs are feeling the pressure to incorporate digital tools into their instruction, but the question remains as to which technologies should be adopted and implemented. Future research should examine the different program structures that positively affect preservice teaching by giving preservice teachers the knowledge and experience necessary to be successful.

Limitations

There were several limitations that may have influenced the results of this study. To begin, due to the limitations associated with finding preservice teachers willing to participate and the constraints of conducting a dissertation study, this study had a small sample size of ten participants. In addition, this study aimed to include several universities of varying characteristics, but due to circumstances outside of the researcher's control, there were only two universities that agreed to participate. While the two universities had differing characteristics, future studies would benefit from including additional universities. Also, after conducting the initial rounds of interviews with all ten participants, it was clear that follow-up interviews were needed. The participants were

asked to either participate in a brief follow-up phone interview or if they preferred, an email interview. Each participant that responded chose to participate in the email interview. These email interviews could possibly be a limitation because email does not allow for the conversation and deeper questioning that can occur during a phone interview. An additional limitation could be the wording used during the interview process. When discussing the barriers and supports, the researcher did not ask the participants to hold their discussed barriers in mind when discussing what supports they felt they would need. While it is possible that some of the preservice teachers automatically addressed their discussed barriers within the context of their discussed supports, it not safe to assume this as it was not specifically asked. While all ten participants indicated interest in continuing with the study past the initial interview, only six participants responded to a request for follow-up interviews. Unfortunately, because not all of the participants responded to the follow-up interviews, the researcher was unable to dig deeper into some of their answers. The ramification of this would be that the data used for this study may not be as deep or as nuanced as it could have been if everyone had responded. Unfortunately, it is impossible to know fully how this would affect these results. Lastly, one of the findings in this study also highlighted a limitation to the study. Since the participants were in the first semester of their teacher education programs, they lacked the context to consider these topics fully, so while their initial thoughts were hesitant or negative, as they continued to discuss them, their thoughts became more and more positive. This is a potential limitation because at first glance it seems as though they are contradicting themselves throughout their interviews, when in reality, they simply did not have the pedagogical knowledge on which to base

instructional decisions. It was then the researcher's job to identify this and probe deeper into their interviews to expose where their initial perceptions were actually coming from. Were their negative perceptions knee-jerk reactions to say negative things or did they really feel that digital technologies do not belong with teaching literacy? In this study, it was observed that often, responses were simply knee-jerk reactions, and probing deeper helped to draw out their real perceptions. This could potentially have been a significant limitation if the researcher was unaware of this and took their initial thoughts as the final word on their perceptions.

Appendix A

Researcher Identity Memo (Reflexivity Memo)

As I begin to explore my position as a budding researcher, it is important for me to identify and understand that all of my previous experiences as a teacher and researcher play an integral piece. When I decided to pursue my interest in the incorporation of technology within literacy instruction, it became clear that I had several levels of interest in these topics. To me, my experiences as an educator heavily impact my opinions on literacy instruction with technology. Over a ten-year teaching career, I taught literacy in some form each year. Eight of those ten years were spent teaching middle school literacy. Out of those eight years, I also had the privilege of working for six years in a relatively technologically-advanced school district. I had many opportunities to learn instructional technology strategies through professional development, and I had easy access to many of the newest technologies to incorporate into my literacy instruction. It is because of these positive experiences that I hold strong feelings regarding its inclusion in literacy instruction. In making this conclusion, I can identify the potential to be subjective and instead focus on being a reflective researcher that is informed my past experiences while preventing them from overtaking my assumptions (Glesne, 2011). If, as Maxwell (2013) states, the researcher “is the instrument” of the research, then it is impossible to remove this potential for bias from my research (p. 45). Instead, my experiences as a literacy

instructor are observed as “experiential data” and should not be ignored because they hold great potential for an insider’s look at the data (Strauss, 1987, p. 11).

In addition, I feel as though I am at a unique age in the technology revolution our society has experienced. As I grew up, I was able to witness technology and the Internet slowly creep into our culture. I remember being about five years old and watching my dad’s Apple computer slowly churn out a calendar on the dot-matrix printer and playing Oregon Trail in elementary school. I learned how to type on a word processing computer in high school, and I was introduced to the Internet and email in college. As I left college and came into the classroom, technology was still at the infantile stage in many schools. Classrooms were lucky to have a few computers, and email was first being used as communication. Now, 10 years later, teaching without my Smart board, Internet access, document cameras, and instant email communication seems like an archaic concept to me. It is through my observance of the evolution of technology and my experience teaching literacy that I can see the immense impact technology is having and will continue to have on literacy instruction. My personal belief is that, as educators, instead of clinging to our print texts decade-old lesson plans, we need to embrace the change our culture is experiencing and incorporate technology into our schools and instructional methods.

My assertion that everyone should feel the same way that I do is admittedly egocentric, but I realize that many people may not share my sentiments regarding technology in literacy instruction. I am approaching this topic with that in mind. I want to understand what other teachers think about including technology in literacy instruction. By identifying my experiences, beliefs and assumptions, my researcher identity allows

me to be reflexive in my design, which Maxwell defines as “the fact that the researcher is part of the social world he or she studies and cannot avoid either influencing this or being influenced by it” (Maxwell, 2013, p. 90).

Appendix B



Office of Research Integrity and Assurance

Research Hall, 4400 University Drive, MS 6D5, Fairfax, Virginia 22030
Phone: 703-993-5445; Fax: 703-993-9590

DATE: July 22, 2014

TO: Gary Galluzzo
FROM: George Mason University IRB

Project Title: [616636-1] Preservice Teachers' Perceptions of using ICTs in Literacy Instruction

SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: July 22, 2014

REVIEW CATEGORY: Exemption category #2

Thank you for your submission of New Project materials for this project. The Office of Research Integrity & Assurance (ORIA) has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

Please remember that all research must be conducted as described in the submitted materials.

Please note that any revision to previously approved materials must be submitted to the ORIA prior to initiation. Please use the appropriate revision forms for this procedure.

If you have any questions, please contact Karen Motsinger at 703-993-4208 or kmotsing@gmu.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within George Mason University IRB's records.



HUMAN SUBJECTS REVIEW BOARD

DATE: August 15, 2014

TO: Melissa Pierczynski (George Mason University); Dr. Gary Galluzzo (George Mason University); and Dr. Karrin Lukacs (Shenandoah University Advisor)

FROM: Megan Bowers, IRB Compliance Coordinator Arthur Harralson, Pharm.D., BCPS, Chair, Institutional Review Board

SUBJECT: IRB #14-2055 Protocol Title: *Preservice Teachers' Perceptions of ICTs in Literacy Instruction*

Your study has been approved by Shenandoah University's Institutional Review Board (IRB) for involvement of human subjects **BEGINNING August 15, 2014 AND ENDING November 30, 2014.**

You may not collect data beyond that date without approval from the IRB. A continuing review form must be completed and submitted to the IRB Compliance Coordinator in the Office of Academic Affairs at least 30 days prior to the anniversary date or upon completion of the project.

Conditional approval is granted for data collection on Shenandoah University (SU) campuses only. If data collection is planned at a site not owned by SU, you must send a copy of the IRB application to each additional facility for independent review. After the review has been completed by the participating institution(s), an administrative representative of the site(s) must send a letter of approval to the SU Compliance Coordinator. *Supplemental approval by participating site(s) and the IRB must be obtained in writing prior to data collection at the new site(s).*

Please note the following:

1. Any modification to your research (including changes in subjects,

equipment, procedures, investigators, funding, and location of data collection site, etc.) must be submitted to the IRB Compliance Coordinator for review and approval *prior to* implementation.

2. Any adverse events or unanticipated problems involving risks to subjects including problems involving confidentiality of the data identifying the participants must be reported to the IRB Compliance Coordinator and reviewed by the IRB.
3. To avoid confusion, please use the assigned university project number above when communicating with the Compliance Coordinator about your project.
4. Your investigation is subject to an annual review. A survey will be sent to the principal investigator approximately one month before the anniversary date of your project. You *must* complete this survey regardless of whether you intend to continue the project for another year.

Please send requested information and updated copies of all changed forms to me preferably by e-mail, to sucomply@su.edu. Address all non-electronic correspondence to the SU IRB Compliance Coordinator, c/o Office of Academic Affairs, 1460 University Drive, Winchester, VA 22601.

Office of Academic Affairs



1460 University Drive, Winchester, VA 22601-5195 | www.su.edu

Appendix C

Preservice Teachers' Perceptions of Using ICTs in Literacy Instruction INFORMED CONSENT FORM

RESEARCH PROCEDURES: This research is being conducted to explore preservice teachers' perceptions of using ICTs in literacy instruction. If you agree to participate, you will be asked to respond to a short demographic survey, which should take about 5 minutes of your time. The survey window will be open for approximately two weeks. From the responses collected, a total of 15 participants will then be selected. Participants selected will be contacted and an interview will be scheduled at your convenience.

RISKS: There are no foreseeable risks for participating in this research.

BENEFITS: There are no benefits to you as a participant other than to further research by exploring preservice teachers' perceptions of using ICTs in literacy instruction. This research is intended to help inform teacher education programs.

CONFIDENTIALITY: The data in this study will be confidential. To schedule the interviews, your name and email address will be collected from the demographic survey. Interviews will be done either online, via telephone or face-to-face. All interviews will be audio recorded and transcribed by hand. These transcriptions will be saved on the researchers' password protected computer. While it is understood that no computer transmission can be perfectly secure, reasonable efforts will be made to protect the confidentiality of your transmission. All identifying information

will be removed from the transcripts and pseudonyms will be used in the data collection to maintain your anonymity. Through the use of an identification key, the researcher will be able to link the survey to your identity and only the researcher will have access to this identification key.

PARTICIPATION: Your participation is voluntary, and you may withdraw from the study at any time and for any reason. If you decide not to participate or if you withdraw from the study, there is no penalty or loss of benefits to which you are otherwise entitled.

CONTACT: This dissertation research is being conducted by Melissa Pierczynski (Co- researcher) in the College of Education and Human Development at George Mason University (GMU). The primary researcher of this project is Dr. Gary Galluzzo. He may be reached at 703- 993-2567 for questions or to report a research-related problem. You may contact the George Mason Office of Research Integrity & Assurance at 703-993-4121 if you have questions or comments regarding your rights as a participant in the research.

This research has been reviewed according to George Mason University procedures governing your participation in this research.

To participate in this study, please begin by completing the survey at: [insert survey monkey address]



Office of Research Integrity & Assurance

Project Number: 616636-1

IRB: For Official Use Only Page 1 of 1

Appendix D

Demographic Information

To be done electronically on Survey Monkey

- 1. Name**
- 2. Email**
- 3. Age: Either ask participant to input age, or choose from an age range**
- 4. Are you enrolled in one of the following programs at George Mason University?**
 - a. Early Childhood Education (BAM or MA)**
 - b. Elementary Education (BAM or MA)**
 - c. English as a Secondary Language Pk-12 (for initial licensure only)**
 - d. FAST TRAIN**
 - e. Secondary Education English (BAM or MA)**
 - f. Special Education program (BAM or MA)**
- 5. What grade levels will you be certified to teach? (Choose all that apply)**
 - a. Birth-3rd**
 - b. PreK-6th**
 - c. 6-9 Middle School Endorsement**
 - d. 6-12**
 - e. K-12**
- 6. Will you be certified to teach Literacy in some capacity?**

- a. Yes
- b. No (redirect to a msg saying thank you, but you don't qualify)
- c. Not Sure

7. How would you classify your personal technology use?

1-Zero technology use

10-Frequent user, can't live without

8. How comfortable are you with technology?

1-Not comfortable at all

10-Completely comfortable

9. Which of these technologies are you comfortable using? (Please choose all that apply)

- a. Reading blogs
- b. Writing Blogs
- c. eBooks
- d. Facebook
- e. Twitter
- f. Other Social Media platforms
- g. Photo sharing sites (ex: Instagram, etc.)
- h. Video Sharing sites (ex: YouTube, Vine, etc.)
- i. Wikis
- j. Using the Internet for Research
- k. Email
- l. Document sharing sites (i.e.: GoogleDocs, etc.).

Appendix E

Interview Protocol

Introduction: “Thank you for agreeing to be a part of this study. I very much appreciate your time. I want to start out by saying that I’m really just looking for your thoughts and opinions. There are no right or wrong answers. I am looking to explore your thoughts of using technology to teach literacy instruction.

General Background Questions:

1. How would you define technology?
2. What are some examples of technology that fit your definition?
[If needed for clarification: “There’s many different ways to define “technology”, but I’m specifically interested in using digital technologies that might be connected to literacy like: eBooks, wikis, reading and writing blogs, photo and video sharing sites (YouTube, Vine, Instagram, etc.), or anything used to communicate and share (email, Skype, messaging apps).”]
3. Tell me a bit about your educational background, especially any technology experiences you had in school (pre-K-now).
4. How would you describe your personal technology use?
5. How would you describe your comfort level with technology in general?
6. How would you define Literacy?

7. Do you think Literacy has been affected by technology? If so, how? If not, why not?

Digital Technology usage in Education

1. What are your thoughts about the use of technology in schools?
2. Think across your experiences in school, either as a student or as an instructor or volunteer. Do you feel as if there are certain grade levels and/or subjects that are more appropriate or easier to include technology in than others? Why/why not?
 - a. Additional Probe for Yes: Ask participant to clarify what is appropriate/easier for what grade level/subject.
3. Do you think using technology in instruction can impact students' learning? Why/how or why not?

Digital Technology usage in Literacy Instruction

1. What experiences do you have with technology use in literacy instruction?
2. How, if at all, do you think technology has changed the way literacy is taught?
3. Do you think it's appropriate to include different literacy based technologies into literacy instruction, such as e-books, blogs, wikis, social media, video blogs (YouTube), apps, or other online interactive communication tools?
 - a. 3 Additional Probes for a "yes", "maybe" or "it depends"- How might you imagine using these in literacy instruction?
 - b. Why would you choose to use these tools in your literacy instruction?
 - c. What do you think the benefits would be to include these tools in instruction?

- d. 1 Additional Probe for a “no”: Why would you choose to not include these tools in your instruction?
4. Do you think these technologies can impact (positively or negatively) students’ literacy learning? Why or why not?

Barriers, Supports & Conditions

1. What barriers do you think you might encounter when trying to incorporate technology into literacy instruction?
2. What supports do you think you might need in order to effectively use these technologies in literacy instruction?
3. I realize you aren’t in a classroom yet, and your experiences in a classroom right now may be only limited to your experiences as a student, but if you had to guess: what kind of technologies would you think are available to you as a classroom teacher?
4. If all Barriers were removed and all Supports were in place, what is your view on using technology in literacy instruction (utopian world)?
 - a. Additional Probe: Can you give some examples of how you would use technology in literacy instruction in this “perfect” environment?

Appendix F

Follow-Up Questions

Just as with the original question, there are NO right or wrong answers, these are purely your thoughts and opinions.

1. People theorize that the younger millennial generation who's been exposed to technology their entire lives will have a more positive idea of using technology in their instruction than the "older" generations who may not have had the same exposures.

Do you feel as though this statement is true for YOU? Does your age determine your perception of technology in literacy instruction? Please explain.

If you don't agree with this statement, what do you think has influenced your thoughts (positive or negative) about using technology for instruction?

2. In looking at all the data across everyone's interviews, there were many positive statements about using technology in Literacy instruction, yet when asked about what subjects would be appropriate to include technology in, English was only mentioned 40% of the time. Do you consider "Literacy" and "English" the same thing or not? Please explain.

3. In your discussion of using technology you had some very valid concerns regarding using technology in your future instruction, yet when you were discussing your future instruction, you envisioned using technology in your literacy instruction. Why do you suppose you imagine using technology in your instruction even with your concerns?

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Biography

Melissa Pierczynski graduated from Nazareth Academy High School in LaGrange Park, Illinois in 1996. She received her Bachelor of Science from Eastern Illinois University in 2000. She was employed by several school districts over her career. Her first position was as a Media Specialist and Gifted Reading teacher at Miller Elementary in Westmont Community Unit School District in Westmont, Illinois. She was then employed as a 6th grade teacher for Cicero School District 99 in Cicero, Illinois. She then received her Master's in Teaching and Leadership from Saint Xavier's University, Chicago, Illinois. From there she was again employed by Westmont Community Unit School District as a 7th grade Language Arts Teacher at Westmont Junior High School. Melissa then moved to Saint Louis, Missouri and was employed at Rockwood School District at LaSalle Springs Middle School as an 8th grade Language Arts and Reading Teacher. She remained there for 6 years before moving to the Washington DC area and began her Ph.D. Program at George Mason University in 2011.